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# Summary, Analysis, and Response to Public Comments on Proposed Amendments to 10 CFR Parts 30, 40, 50, 51, 70, and 72

Decommissioning Criteria for Nuclear Facilities

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**U.S. Nuclear Regulatory  
Commission**

Office of Nuclear Regulatory Research



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Office of Nuclear Regulatory Research  
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Washington, DC 20555**





## ABSTRACT

On February 11, 1985, the NRC issued for public comment proposed rules on decommissioning of nuclear facilities (50 FR 5600). Comment letters were received from 143 organizations and individuals. This report provides a summary and analysis and response to the public comments received.



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Summary, Analysis, and Response -  
Public Comments on Proposed  
Amendments to 10 CFR Parts 30, 40, 50, 51, 70, and 72:  
Decommissioning Criteria for Nuclear Facilities

## A.1 Introduction

On February 11, 1985, proposed amendments to 10 CFR Parts 30, 40, 50, 51, 70, and 72 on Decommissioning Criteria for Nuclear Facilities were published for public comment in the Federal Register (50 FR 5600). The original comment period expired May 13, 1985 but was extended to July 12, 1985. In response to this request for comments, the NRC received letters from the individuals and organizations listed in Section A.2.

All of the comments received were considered with respect to improving and revising the final text of the amendments. This document presents the NRC staff's analyses of these comments. As outlined in Section A.3, Sections B through H contain a summary, analysis, and response to all comments received. To reduce repetition in Sections B through H, similar comments were combined. As indicated in Section A.3, the comments, and the staff analysis and response to the comments are arranged according to the general subjects treated by the proposed rule and Supplementary Information to the proposed rule. The source of each comment is identified by the number given to each comment letter as it was received by the Commission's Public Document Room.

## A.2 Comments Received on Proposed Rule

The following commenters responded to the Federal Register Notice:

<u>Docket No.</u>	<u>Commenter</u>
1.	Ecology Alert
2.	United States Department of the Interior
3.	State of Oregon, Department of Energy
4.	State of Minnesota, Department of Public Service
5.	John P. & Helene J. Forst
6.	Martin J. Dreyfuss
7.	Yale Maxon
8.	Kermit F. Cuff Jr.
9.	Public Citizen/Environmental Action
10.	Harriet Pellar
11.	Hannah L. Katz
12.	Ray F. Smith
13.	Barbara Levy
14.	Jerry Depew
15.	Peter R. Mitchell
16.	Mary L. Steketeer
17.	Constance G. Weeks

<u>Docket No.</u>	<u>Commenter</u>
18.	North Carolina Public Interest Research Group
19.	University of Virginia, Department of Nuclear Engineering and Engineering Physics
20.	Mercy Medical Center
21.	Rhode Island Atomic Energy Commission
22.	San Diego Gas & Electric
23.	Yankee Atomic Electric Company
24.	Department of the Army, Department of Defense
25.	General Electric
26.	Detroit Edison
27.	Mary Z. Skorapa
28.	Cerac Incorporated
29.	Pennsylvania Public Utility Commission
30.	Sacramento Municipal Utility District
31.	Northeast Utilities
32.	Philadelphia Electric Company
33.	Ohio Citizens for Responsible Energy
34.	Massachusetts Institute of Technology, Nuclear Reactor Laboratory
35.	The Pennsylvania State University
36.	Safe Power for Maine
37.	Educational Campaign for a Prosperous Georgia
38.	State of Michigan, Department of Commerce
39.	Lois M. Barber
40.	United States Environmental Protection Agency
41.	Patricia T. Birnie
42.	Aileene Gauntt
43.	FMC Wyoming Corporation
44.	Kershaw County Safe Energy Project
45.	Martha Drake
46.	Dean Witter Reynolds, Inc.
47.	Governor's Special Committee on Decommissioning Maine Yankee
48.	County of Santa Cruz, Board of Supervisors
49.	Mr. Alva Morrison on behalf of Maine Nuclear Referendum Committee
50.	County of Bedford, Pennsylvania, Commissioner's office
51.	Concerned Citizens for SNEC Safety
52.	Virginia McGowan
53.	Atomic Industrial Forum, Inc., Committee on Radionuclides and Radiopharmaceuticals
54.	Bill Schwarz
55.	Gary P. Proctor
56.	Citizens Association for Sound Energy
57.	Naomi Jacobson, LAND, Inc.
58.	Bedford County Conservation District
59.	Citizens Opposed to Radioactive Pollution
60.	Pacific Gas and Electric Company
61.	Bishop, Liberman, Cook, Purcell, & Reynolds
62.	Spiegel and McDiarmid
63.	LeBoeuf, Lamb, Leiby & MacRae
64.	The Association of the Bar of the City of New York, Committee on Nuclear Technology & Law
65.	Mallinckrodt, Inc.

<u>Docket No.</u>	<u>Commenter</u>
66.	Iowa Electric Light and Power Company
67.	California Public Utilities Commission
68.	Mike Andrews
69.	Commonwealth of Virginia, Department of Emergency Services
70.	University of Missouri, Research Reactor Facility
71.	Russell M. Maynard, MD
72.	The Conservation Council of North Carolina
73.	American Electric Power Service Corporation
74.	Concerned Citizens for SNEC Safety
75.	Houston Lighting and Power
76.	E. I. DuPont DeNemours & Co, Biomedical Products Department
77.	Carolina Power & Light Company
78.	Bedford County Environmental Committee
79.	Dale Saltzman
80.	Seacoast Anti-Pollution League
81.	David S. Pate
82.	Lakeland Audubon Society, Inc.
83.	Utility Ratecutters of Kentucky
84.	Coalition for the Environment
85.	State of Rhode Island, Department of Health
86.	Minnesota Public Interest Research Foundation
87.	Cleveland Electric Illuminating Company
88.	Portland General Electric Company
89.	Minnesota Environmental Quality Board
90.	State of New Jersey Department of Environmental Protection
91.	Wisconsin Public Service Corporation
92.	Sierra Club
93.	M. I. Lewis
94.	Charles C. Williams
95.	Redwood Alliance
96.	Texas Department of Health
97.	Omaha Public Power District
98.	Saxton Nuclear Experimental Corporation
99.	Southern California Edison Company
100.	Georgia Power Company
101.	Alabama Power Company
102.	Duke Power Company
103.	Nuclear Information and Resource Service
104.	Arkansas Power & Light Company
105.	Duquesne Light Company
106.	Baltimore Gas & Electric
107.	Consumers Power Company
108.	Public Service Company of New Mexico
109.	Iowa State Commerce Commission
110.	State of Washington, Energy Facility Site Evaluation Council
111.	Public Service Electric & Gas Company
112.	GPU Nuclear Corporation
113.	Arizona Public Service Company
114.	Long Island Lighting Company
115.	Kerr-McGee Corporation
116.	Washington Public Power Supply System

<u>Docket No.</u>	<u>Commenter</u>
117.	GA Technologies
118.	Duke Power Co.
119.	Minnesota Department of Health
120.	Ecology Center of Southern California
121.	Henry Peck
122.	Concerned Citizens for SNEC Safety
123.	Virginia Power
124.	3M Company
125.	State of Maine, Senate Chamber
126.	Atomic Industrial Forum, Inc.
127.	Northern States Power Company
128.	American Electric Power Service Corp
129.	State of Illinois, Attorney General
130.	Dairyland Power Cooperative
131.	Bishop, Liberman, Cook, Purcell & Reynolds
132.	Florida Power & Light Company
133.	Public Service Company of Colorado
134.	Wisconsin Electric Power Company
135.	Department of the Army
136.	Minnesota Environmental Quality Board
137.	State of Nevada, Nuclear Waste Project Office
138.	TLG Engineering
139.	Niagara Mohawk Power Corporation
140.	State of Oregon Department of Energy
141.	State of New York Department of Public Service
142.	Labros E. Pilalis
143.	Bishop, Liberman, Cook, Purcell & Reynolds

## A.2 Index of Issues

The analysis of the individual issues raised by the commenters is structured, to the extent practical, according to general subjects treated by the rule and discussed in the Supplementary Information to the rule. The section numbers are indicated as part of the summary and analysis of and response to the public comments.

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## B. Decommissioning Alternatives

### B.1 Definition of decommissioning

#### B.1.1 Clarify use of word decommission

##### 1. Comment Summary

Commenter indicated that there is no commonly accepted definition of decommissioning since three different decommissioning methods, DECON, SAFSTOR, and ENTOMB are allowed. (9)

##### Comment Analysis and Response

The commenter indicates that three very different methods have been described by the nuclear utilities and the government and then provides the descriptions of each of these methods, namely DECON, SAFSTOR, and ENTOMB. However the Supplementary Information to the proposed rule (Ref. 1) and the rule text itself make it clear that although there are three approaches to accomplishing the decommissioning, each of them conforms to the definition of decommissioning as contained in Section 50.2 which is "to remove a facility safely from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of license." While each decommissioning method may entail different activities and lengths of time to complete, they all result ultimately in termination of license and release for unrestricted use.

##### 2. Comment Summary

Commenter indicated that the definition of decommissioning was too restrictive and that it should be revised to clarify that decommissioning only refers to the process of getting to the end point of termination of license. The actual end point of termination of license with unrestricted use should be separately stated. (126)

##### Comment Analysis and Response

The definition of decommissioning as expressed in the rule provides a description of the process in a regulatory framework. Specifically it is the process of removing a facility safely from service and reducing residual radioactivity to a level which permits release of the facility for unrestricted use and termination of the license. This definition expresses the complete process of decommissioning and puts it into the context of reaching a safe point.

## B.1.2 Clarify what facilities are covered

### 1. Comment Summary

Six commenters indicated that the rule needed to provide clarification as to what facilities are covered by the decommissioning rule. These commenters indicated that there appeared to be a discrepancy between proposed Section 50.2 which defined decommissioning as removing a facility "safely from service and reducing residual radioactivity to a level that permits release of the property for unrestricted use and termination of license" and the Supplementary Information which indicates that decommissioning means to remove "nuclear facilities" from service including "the site, buildings and contents, and equipment associated with any licensed NRC activity." The commenters indicated that it appeared that the definition in the statement was too broad and not within the generally understood scope of decommissioning. Two comments indicated that the rule should clarify that it does not apply to the nonradioactive portion of the facility. (32, 61, 102, 123, 126)

### Comment Analysis and Response

The definition of decommissioning in Section 50.2 clearly defines what is intended by this rulemaking, namely that decommissioning involves those activities necessary to remove a facility safely from service and to reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of license. Section 50.82 indicates that a licensee must provide NRC with a plan indicating how these activities will be carried out and that this plan will be approved if it demonstrates that the decommissioning will be performed in a safe manner. Section 50.82(f) indicates that the NRC will terminate the facility license if the terminal radiation survey demonstrates that residual radioactivity has been reduced such that the facility and site are suitable for release for unrestricted use. The definition of decommissioning in Section 50.2 is general and its application in any given case will depend on specific circumstances.

The decommissioning rule applies to the site, buildings and contents, and equipment associated with a nuclear facility that are or become contaminated during the time the facility is licensed, and to activities related to the definition of "decommission" in the amended regulations. The decommissioning rule will not apply to the disposal of nonradioactive structures and materials beyond that necessary to terminate the NRC license. Disposal of nonradioactive hazardous waste not necessary for NRC license termination is not covered by these regulations but would be treated by other appropriate agencies having responsibility over these wastes.

### 2. Comment Summary

One commenter questioned whether the process of decommissioning deals with pools of spent fuel rods now in temporary storage at reactor sites. One commenter indicated that spent fuel storage facilities and other storage facilities are licensed under Part 72 whereas power stations are licensed under Part 50, and the rule should be specific as to what is addressed. (41, 123)

## Comment Analysis and Response

Decommissioning deals with pools of spent fuel rods in temporary storage at reactor sites only in the sense that a licensee which must maintain these storage pools after the facility permanently ceases operation must consider what decommissioning alternatives will be used in this situation. A licensee in this situation cannot use the DECON alternative but would have to use the SAFSTOR or ENTOMB alternative. This is discussed in the Supplementary Information to the proposed rule and in more detail in two PNL studies, NUREG/CR-0130, Addendum 2, (Ref. 2) and NUREG/CR-0672, Addendum 1 (Ref. 3) both of which are subtitled "Effects on Decommissioning of Interim Inability to Dispose of Wastes Offsite."

The actual safety aspects and costs associated with storage of spent fuel on an interim basis after shutdown would not be dealt with as part of a licensee's actual planning of decommissioning activities or in the decommissioning plan which he would submit to the NRC under Section 10 CFR 50.82. These items are treated in the existing regulations in 10 CFR 50.54(bb) in which it is indicated that, for operating power reactors, licensees are to submit written notification to the Commission for its review and preliminary approval of the program by which the licensee intends to manage and provide funding for the management of all irradiated fuel at the reactor upon expiration of the reactor operating license until the fuel is transferred to DOE for ultimate disposal.

Since the storage of spent fuel at a reactor is outside the scope of this rule, the proposed decommissioning rule does not address whether the storage of spent fuel at a reactor is licensed under 10 CFR Part 50 or 10 CFR Part 72.

### B.1.3 Requirements for unrestricted use as part of definition of decommissioning

#### Comment Summary

Two commenters indicated that requiring unrestricted use as part of the definition of decommissioning is too restrictive. One comment indicated that the rule should be careful to avoid inhibiting site uses that cannot be construed as unrestricted especially since the plant sites are improved private property. One comment suggested that no reference to unrestricted use be contained in the definition since this would preclude alternative decommissioning methods which provide reasonable assurance of public health and safety without releasing the site for unrestricted use. In contrast, four commenters stated that decommissioning should clearly result in safe unrestricted use of the site. (5, 18, 22, 78, 82, 104)

#### Comment Analysis and Response

It is the Commission's belief that there is nothing in the definition which would inhibit future use of the site once the license is terminated. According to amended Section 50.2 (and related sections in the other parts) decommissioning is defined as removing a facility safely from service and reducing residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license. The Commission's objective is that decommissioned facility sites would ultimately

be available for unrestricted use for any public or private purpose. Unrestricted use refers to the fact that from a radiological standpoint, no hazards exist at the site, the license can be terminated, and the site can be considered an unrestricted area. This definition is consistent with the definition of an unrestricted area as it exists in 10 CFR 20.3 as being "any area access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials and any area used for residential quarters." The alternatives for decommissioning provide different ways to accomplish decommissioning as defined in the rule, i.e., alternative ways to reduce residual radioactivity to a level permitting release of the property for unrestricted use and termination of license. These alternatives are DECON, SAFSTOR, and ENTOMB which are discussed in more detail below but which primarily consist of activities which either result in prompt dismantlement of the facility or which permit a storage period during which radioactive decay can occur prior to dismantlement of the facility. Each of the alternatives includes all those activities necessary to lead to termination of the NRC license. Once the license is terminated, the facility buildings and site can be used for any other non-nuclear purposes, including industrial purposes. The use made of the facility after termination of the NRC license is independent of the alternative used to decommission the facility. With regard to reuse of the site for nuclear purposes, there is nothing in the rule preventing such reuse. As indicated above, reuse of the nuclear facility for other nuclear purposes is not considered decommissioning. Therefore, a licensee would not be required to submit a decommissioning plan or apply for termination of license.

As noted in Sections B.3 through B.5 of this report, the rule considers the use of alternative decommissioning methods which delay the completion of decommissioning thereby not releasing the site for unrestricted use during a period of radioactive decay. The definition of decommissioning as well as the definitions of the alternatives contained in the Supplementary Information to the Proposed Rule indicate that, if permanent cessation of nuclear activity occurs at the facility, the licensee is to propose to NRC the method that it intends to use in decommissioning the facility in a manner ultimately leading to the return of the site to an "unrestricted area" according to the definition of 10 CFR 20.3 and the termination of the facility license. In determining whether a particular site is free from radiological hazards, the Commission will take a hard look at the extent to which the site has been previously used to dispose of low-level radioactive wastes by land burial and will decide what remedial measures, including removal of such waste offsite, are appropriate before the site can be released for unrestricted use and the license terminated.

## B.2 Definition of alternatives

### B2.1 Clarify definition of alternatives

#### Comment Summary

Five commenters indicated that the decommissioning alternatives are vaguely defined and hence meaningless. Thus comparison of alternatives in terms of

costs and benefits is difficult since the rule does not give a fair picture of the complexities involved in the different alternatives. (5, 18, 57, 93, 103)

#### Comment Analysis and Response

In the proposed rule each of the alternatives is defined in the Supplementary Information. The definitions provide a description of DECON, SAFSTOR, and ENTOMB and the Supplementary Information indicates the acceptability of the alternatives based on the costs and benefits of the alternatives. This evaluation is based on an extensive information base developed for the NRC by Battelle Pacific Northwest Laboratories (PNL) and by Oak Ridge National Laboratory (ORNL) (Refs. 2-19). These reports are listed in the reference section of the Federal Register Notice in which the proposed rule was published (Ref. 1) and in Section I of this report. The PNL and ORNL reports represent the best information currently available with regard to decommissioning and are based on decommissioning and decontamination experience at a number of facilities. The PNL and ORNL reports contain detailed discussions of the technology, safety, and costs of each of the alternatives considered for decommissioning in the proposed rule. In particular, the reports analyze the work activities involved in each of the alternatives, the labor necessary to complete the work activities, associated costs, waste disposal quantities, and radiation exposures to plant workers and the public. Based on the PNL and ORNL reports, the NRC prepared the Generic Environmental Impact Statement on Decommissioning Nuclear Facilities, NUREG-0586, (Ref. 20) which summarized the data in the PNL and ORNL reports and which provided an analysis of the costs and benefits associated with each of the alternatives.

This analysis is summarized in the Supplementary Information to the proposed rule. Further guidance on the decommissioning alternatives will be found in revisions to Regulatory Guide 1.86.

#### B.2.2 Use of acronyms

##### Comment Summary

One commenter objected to the use of the acronyms DECON, SAFSTOR, and ENTOMB in the rulemaking since it causes confusion preferring instead the nomenclature of Regulatory Guide 1.86. One commenter considered the categories and their definitions appropriate but recommended that ordinary phraseology be used in lieu of acronyms and that these definitions be included in the regulation. (104, 134)

##### Comment Analysis and Response

The purpose of the acronyms is to reduce confusion and misunderstanding. In the past, the nomenclature to describe the alternatives has not been consistent. In particular, the discussion in the Supplementary Information to the Proposed Rules which describes the terms DECON, SAFSTOR, and ENTOMB clearly indicates the activities involved in carrying out decommissioning and clearly states that they all satisfy the definition of decommissioning as stated in 50.2 which is to remove a facility safely from service, to reduce radioactivity to a level which permits unrestricted use of the

facility, and to terminate the license. Earlier terminology contained in Regulatory Guide 1.86 (Ref. 21), such as mothballing and in-place entombment, was vague as to the ultimate disposition of the facility and not consistent with the amended 50.2. The amendments themselves do not use the acronyms, however, they are considered sufficiently clear and flexible in dealing with decommissioning plans.

### B.3 Choice of alternative

#### B.3.1 Criteria used for choice of alternative

##### 1. Comment Summary

A number of commenters indicated that the rule does not contain sufficient criteria that a utility can use in choosing which decommissioning alternative should be used and that can be used in the review and evaluation of that choice. Some of these commenters pointed out that these criteria should factor in important considerations to be made in the choice, including clarifying what is sufficient benefit for delaying decommissioning, and that the choice of alternative be based on a detailed assessment demonstrating that the health and safety of the public is protected.

These commenters indicated that better criteria on sufficient benefits should be included in the rule, specifically the degree of reduction in occupational radiation exposure, generation and disposal of waste, assurance that decommissioning will take place, radiation doses to the public, and quality of decommissioning operations. Other commenters mentioned that economic or other factors should also be included as being sufficient benefit, including comparative cost of alternatives, presence of other facilities at the site, development of new decommissioning techniques, and need to store wastes or spent fuel at the site. Some commenters indicated that it was not satisfactory to include criteria on acceptable alternatives in regulatory guides as is proposed in the supplementary information while other commenters indicated that it is. (5, 33, 41, 44, 49, 51, 55, 56, 57, 58, 60, 68, 72, 73, 78, 82, 86, 88, 92, 93, 95, 101, 103, 126, 128, 132, 137)

##### Comment Analysis and Response

It should be noted that the intent of the rule is to provide the necessary guidelines with regard to use of decommissioning alternatives in a manner which protects the public health and safety. Specifically, the rule includes requirements that, at the time of termination of operations, licensees submit a decommissioning plan to the NRC which contains an indication of the decommissioning alternative to be used and a description of the activities involved and the controls and limits on procedures to protect occupational and public health and safety for that alternative. Discussion of how the decommissioning plan and the chosen alternative are evaluated in terms of protecting health and safety is contained below in Section C.1.3.

In addition, §50.82 of the proposed rule stipulated that alternatives which significantly delay completion of decommissioning, such as use of a storage period, will be acceptable if sufficient benefit results. This section of the proposed rule has been modified in two ways. The first is

to be more definitive in terms of acceptable decommissioning alternatives by permitting power reactors to use alternatives which provide for completion of decommissioning within 60 years. This is consistent with the technical data base developed as part of the rulemaking (Refs. 2 and 3) and with the conclusions of the Supplementary Information to the Proposed Rule. In the Supplementary Information, it was indicated that DECON or SAFSTOR for up to 50 years are reasonable options for decommissioning a light water power reactor. The reason for both of these alternatives being acceptable is that both have benefits and both are capable of being carried out in a manner which protects public health and safety. In selecting 60 years as an acceptable period of time for decommissioning of a nuclear power reactor, the Commission considered the amount of radioactive decay likely to occur during an approximate 50-year storage period and the number of months expected to be needed to dismantle the facility (Refs. 2 and 3). In addition to this change, the modified rule also states that consideration will be given to a decommissioning alternative which provides for completion of decommissioning beyond 60 years for power reactors only when necessary to protect public health and safety. Factors, set out in the modified rule, which would be considered in evaluating an alternative which provides for completion of decommissioning beyond 60 years include unavailability of waste disposal capacity and other site specific factors affecting capability to carry out decommissioning safely, including presence of other nuclear facilities at the site.

Section 50.82(b)(1) of the proposed rule has also been modified for non-power reactors. Because of the variety of type of these reactors, specific criteria on time periods for completing decommissioning, such as indicated above for power reactors, are not included for non-power reactors. However, the proposed rule has been modified to provide additional detail on the factors affecting acceptability of decommissioning alternatives for non-power reactors. These factors include considerations affecting waste disposal for the different alternatives and other site-specific factors affecting capability to carry out decommissioning operations safely, such as presence of other nuclear facilities at the site and reduction of occupational and public radiation exposures associated with the different alternatives. Other factors not related to protection of health and safety are not included in the consideration of alternatives in the modified rule. In addition, Regulatory Guide 1.86 will be revised to provide additional guidance on the decommissioning alternatives, specifically guidance on the factors affecting delay in completion of decommissioning. Use of the modified rule in conjunction with the regulatory guidance will provide for an expeditious licensing procedure. A licensee's proposed decommissioning alternative will be reviewed based on the criteria and guidance discussed here and in Section C 1.3 for acceptability in terms of completing decommissioning and protecting public health and safety.

## 2. Comment Summary

One commenter indicated that in making the choice of alternatives that, provided a licensee observes its statutory and common law obligations to protect the public health and safety, it is improper to use the NEPA concept of cost-benefit balancing in making NRC staff licensing decisions on decommissioning alternatives. (117)

### Comment Analysis and Response

As stated in amended Section 50.82(e), NRC staff licensing decisions with regard to decommissioning alternatives are that the decommissioning plan demonstrates that the decommissioning be performed in accordance with the regulations and will not be inimical to the common defense and security or to the health and safety of the public. The NRC's evaluation of a licensee's proposed use of a certain alternative will be based on the evaluation of that alternative in terms of protecting public health and safety. More detail on this is contained in Section B.3.1 in response to Comment Summary No. 1 and in Section C.1.3.

#### B.3.2 Difficult to choose alternative due to lack of sufficient information on occupational exposure

##### Comment Summary

One commenter noted that neither the NRC nor the licensees can properly assess costs and benefits attributable to different alternatives due to the lack of sufficient information on occupational exposure. The commenter noted that NRC had no experience with decommissioning large, aged reactors and that, for example, the experience at the cleanup at TMI-2 had shown the workers were being exposed to radiation levels six times higher than expected. Thus, it is likely the decommissioning estimates of exposure are gross underestimates. In addition the commenter stated that there is much uncertainty with regard to radiation effects on human health, indicating that some of his information sources say limits should be raised and others say they should be reduced ten-fold. Furthermore the commenter indicated that the Generic Environmental Impact Statement on Decommissioning (NUREG-0586), (Ref. 20), which provides a basis for this rulemaking, does not adequately address health and genetic effects. Hence the commenter noted it is difficult to assess the proper alternative and that, in any event, in making assessments NRC should use conservative estimates. (103)

##### Comment Analysis and Response

NRC has had Battelle Pacific Northwest Laboratory (PNL) prepare detailed analyses of the technology, safety, and costs of decommissioning (Refs. 2-15). These reports were prepared for a number of nuclear facilities and are listed in the Reference section of the Federal Register Notice and in Section I of this report. The PNL reports contain estimates of expected occupational radiation exposures based on an analysis of work activities involved in decommissioning and radiation levels expected at the end of reactor life.

While it is true that no large, aged reactors have been decommissioned, the PNL reports represent a reasonable analysis of the occupational dose which would be incurred at decommissioning. They provide sufficient information so that assessment of the different alternatives can be made, specifically that DECON can be carried out while maintaining occupational exposures at reasonable levels while SAFSTOR and ENTOMB can result in reduction in occupational exposures. Thus, choice of the alternative can be made.

It should be noted that for any of the alternatives, occupational exposures will be limited by the requirements of 10 CFR Part 20 and that, in particular, licensees should maintain exposures to workers to as low as reasonably achievable levels. Thus, radiation exposure to workers will be kept at acceptable levels for any of the alternatives used. The health impacts of radiation and concerns over whether limits on exposure should be raised or lowered are outside the scope of this rulemaking and are the type of issues being addressed currently in a separate rulemaking that proposes to amend 10 CFR Part 20. The allowed occupational exposures during the decommissioning period will conform to the requirements of 10 CFR Part 20. The Generic Environmental Impact Statement (NUREG-0586) (Ref. 20) analyzed the occupational exposures which would be received during decommissioning and found that over a 4-year decommissioning period they would be similar to that which would be experienced at an operating facility on a yearly basis. Thus, NRC determined that the health impact of decommissioning did not add significantly to the operating plant impact.

In summary, the information currently available provides NRC with a reasonable understanding of the safety aspects involved in decommissioning and also provides sufficient information to evaluate alternatives. As more information becomes available, NRC will factor it into the decision-making process. It is not feasible to compare the increases in the estimates at TMI-2 to decommissioning since the TMI-2 estimates were for a post-accident situation where there was significant contamination and the situation was initially uncertain with regard to contamination levels and cleanup procedures. When licensees prepare their decommissioning plans for submittal to the NRC for approval under the requirements of 10 CFR 50.82, they will have more information about the conditions in the reactor and will provide more up to date information about occupational exposures during decommissioning. At that time NRC will be able to evaluate the choice of decommissioning alternative for the specific facility.

### B.3.3 NRC should control choice of alternative

#### Comment Summary

Commenters indicated that the choice of the decommissioning alternative should not be left to the discretion of the utility but that the NRC should choose the alternative to be used. (18, 39, 48, 92)

#### Comment Analysis and Response

The choice of an alternative depends on a number of factors. These include factors which have safety implications such as reduction in occupational exposure and radioactive waste volume, and availability of waste disposal capacity, and the presence of other facilities on the site. Choice of an alternative can also depend on factors such as the economics of one alternative versus another and the expected ultimate use of the site. These factors are not safety-related and hence are not part of NRC's decision-making responsibility. Thus a licensee makes a decision regarding the decommissioning alternative based on a number of both safety-related and nonsafety-related factors. If the alternative proposed by a licensee results in decommissioning being carried out in a manner which protects

the public health and safety it will be acceptable to NRC. Amended Section 50.82 requires that, following permanent cessation of operations, a licensee submit a decommissioning plan to the NRC. This plan must contain a description of the decommissioning alternative, including a description of the controls and limits on procedures and equipment to protect occupational and public health and safety and a description of the planned final radiation survey. Section 50.82(b) contains requirements on the decommissioning alternatives which may be used and Section 50.82(e) states that if the decommissioning plan demonstrates that this chosen alternative is such that decommissioning can be carried out safely that the Commission will allow it to be used. Thus the NRC has approval control over any alternative chosen with respect to its safety.

#### B.4 Use of DECON and SAFSTOR

##### B.4.1 Rule appears to favor DECON

###### Comment Summary

Three commenters noted that the rule seems to favor use of prompt decommissioning or DECON for reactors, because the rule requires a detailed plan 5 years prior to projected end of operations and because the statement of considerations neglects the benefits of the other alternatives. (22, 104, 134)

###### Comment Analysis and Response

The amendments do not contain a preference for DECON for reactors and, as noted in Section B.3.1, the modified rule specifically allows SAFSTOR for up to 60 years. The preliminary decommissioning plan which is required 5 years prior to projected end of operations does not itself favor or necessitate use of DECON. It only requires submittal of an up-to-date cost estimate and a current assessment of major factors which could affect planning for decommissioning. For example, if a utility were planning to use SAFSTOR, that could be indicated in the preliminary decommissioning plan submitted 5 years prior to shutdown. Amended 50.82(d) indicates that for decommissioning plans in which it is intended that there be a storage period, that planning for these delayed activities may be less detailed.

With regard to indication of benefits for other alternatives besides DECON, the Supplementary Information to the proposed rule discussed the fact that SAFSTOR or ENTOMB will have benefits in reduction of occupational dose and radioactive waste volume and, in addition, may have advantages where there are other operational nuclear facilities at the same site, and may be necessary in other cases if there is a shortage of radioactive waste disposal space offsite.

##### B.4.2 Advantages and disadvantages of the DECON and SAFSTOR alternatives

###### Comment Summary

A number of commenters expressed opinions on the rule with regard to allowing use of DECON and SAFSTOR. Some commenters favored the use of DECON,

one in particular noting that it should be used at a site of high potential for a seismic event. Other commenters noted the problems associated with DECON including the higher occupational exposure involved and problems associated with inability to dispose of wastes. Some commenters noted that site specific factors should come into play and that either DECON or SAFSTOR should be possible. Some commenters noted that because of problems associated with DECON, that SAFSTOR was the best option. (9, 30, 42, 44, 51, 54, 58, 59, 78, 80, 82, 92, 95, 100, 101, 104, 112, 123, 126, 137)

#### Comment Analysis and Response

The NRC is aware of and has considered the issues related to the advantages and disadvantages of the DECON and SAFSTOR options. The studies done for NRC by Battelle Pacific Northwest Laboratory (PNL) considered factors such as cost of the alternative and occupational exposure and waste volumes associated with each alternative. The PNL studies also considered the effects on decommissioning of interim inability to dispose of wastes off-site. The Generic Environmental Impact Statement on Decommissioning Nuclear Facilities (NUREG-0586) (Ref. 20) prepared by NRC also addressed the advantages and disadvantages of DECON versus SAFSTOR including the fact that DECON releases the site for unrestricted use in a much shorter time period than SAFSTOR, whereas use of SAFSTOR would reduce occupational exposures and waste volumes. Both of these alternatives satisfy the definition of decommissioning in Section 50.2. Based on the documents indicated above and on the discussion in the Supplementary Information to the proposed rule, the conclusion of the Supplementary Information regarding these two alternatives is that DECON or 30- to 50-year SAFSTOR are reasonable options for decommissioning light water power reactors. As indicated in Section B.3, the proposed rule has been modified to permit use of DECON or SAFSTOR for up to 60 years as long as it is demonstrated that they will be performed in a manner which protects public health and safety. Use of the 60-year time period in the modified rule is not intended to mean that if DECON is selected that it would be acceptable for it to last that long; periods of 5-10 years would be more reasonable for DECON.

#### B.4.3 Time limit on SAFSTOR

##### Comment Summary

Several commenters stated that the rule should contain requirements that if the SAFSTOR alternative is chosen, reactor decommissioning be completed following storage periods of a maximum of 30-50 years because after this time period there will be little benefit in dose or waste volume reduction. In contrast, four commenters stated that even a 100-year period was too restrictive because periods of over 100 years are allowed in waste disposal facilities. Four commenters indicated that the rule should provide criteria by which the appropriate length of time for the storage period of SAFSTOR can be determined, balancing site-specific costs and benefits. (9, 40, 49, 52, 53, 71, 86, 95, 102, 103, 117, 126)

## Comment Analysis and Response

The Commission does not believe it necessary for the rule to contain an absolute time limit on how long SAFSTOR can last. Instead, as noted in Section B.3, modified Section 50.82(b) indicates that a power reactor licensee's decommissioning plan must indicate a choice of decommissioning alternative, that DECON or 60-year SAFSTOR is acceptable, and that consideration will be given to alternative methods for decommissioning which provide for completion of decommissioning beyond 60 years when necessary to protect public health and safety. Factors considered in evaluating an alternative which provides for completion of decommissioning beyond 60 years include lack of waste disposal capacity or other factors affecting safety, including presence of other nuclear facilities on the site.

The rule does not contain a specific limitation on the length of time for SAFSTOR beyond the time period indicated in the modified rule. The case-by-case considerations, such as shortage of radioactive waste disposal space offsite or presence of an adjacent reactor whose safety might be affected by dismantlement procedures, or other similar site specific considerations, mean that the appropriate delay for a specific facility must be based on factors unique to that facility and could result in extension of completion of decommissioning beyond 60 years. Based on this, the NRC considers the setting of an absolute time limit on SAFSTOR to be impractical and unnecessary. In addition, the expected revisions to Regulatory Guide 1.86 setting out guidance on the factors discussed above will provide the NRC the flexibility to consider specific cases while still providing assurance that the health and safety of the public is protected.

Although the final rule does not contain specific restrictions on the time period involved for delay in completion of decommissioning, the Supplementary Information to the proposed rule does indicate that this period should be on the order of 100 years because this is considered a reasonable time period for reliance on institutional control. Although commenters refer to longer periods of storage for waste disposal facilities there are some differences between these two situations which must be considered, including the fact that, in the case of the waste disposal facility, the NRC transfers the license for the facility to the State or Federal government agency that owns the disposal site following satisfactory site closure whereas the reactor facility would remain licensed by a private organization, and that there are only a small number of disposal facilities compared to possibly over 100 reactor facilities.

### B.4.4 Bankruptcy during SAFSTOR

#### Comment Summary

Two commenters expressed concern over the use of SAFSTOR as an alternative since a utility could very well go bankrupt during the safe storage period especially if it is as long as 100 years. (81, 82)

## Comment Analysis and Response

This rule requires licensees to have a funding plan that provides reasonable assurance that funds will be available for the completion of decommissioning. Section 50.82(c)(1) requires that if a licensee proposes to use an alternative for decommissioning that delays completion of decommissioning by including a period of storage or long term surveillance that funds needed to complete decommissioning be placed into an account segregated from licensee assets and outside its administrative control during the storage period. Review and adjustment of the funding level will also occur over the SAFSTOR period. With these provisions it is expected that there will be reasonable assurance of the availability of funds for decommissioning following the storage period of SAFSTOR.

### B.4.5 SAFSTOR for materials facilities

#### Comment Summary

One commenter stated that short-term SAFSTOR should be indicated as a viable option for materials facilities due to the short half-life of materials handled at the facility. (65)

#### Comment Analysis and Response

The amendments do not prohibit short-term SAFSTOR for materials facilities. Amended Section 30.36(c) indicates that upon termination of licensed activities, the licensee submit a decommissioning plan which includes, among other items, a discussion of planned decommissioning activities, and that upon approval of the plan the licensee is to complete decommissioning in accordance with the plan. The Supplementary Information to the proposed rule indicates that although DECON is the most likely option (because occupational exposures are quite low in most cases), SAFSTOR is possible for short-lived materials, although extended delay would rarely be justifiable.

If, after disposing of inventory and some preliminary decontamination, contamination from relatively short-lived materials is reported, the Commission will determine whether allowing a period for decay is an appropriate means of completing decommissioning. Hence a licensee should provide these details in his decommissioning plan. Further guidance in this area will be contained in a regulatory guide on termination of licenses for materials facilities which is under development.

### B.5 Use of ENTOMB

#### 1. Comment Summary

A number of commenters indicated that the rule should expressly prohibit the use of ENTOMB as a decommissioning alternative for reactors. Several reasons were advanced for this statement including the following: the ENTOMB alternative could cause environmental damage due to the presence of long-lived radionuclides which would be radioactive beyond the life of any concrete structure; the Supplementary Information to the proposed rule indicates ENTOMB is not viable yet the rule does not explicitly prohibit

it; ENTOMB is inconsistent with the definition of decommissioning requiring release for unrestricted use; and some reactors are located in highly populous areas. One comment indicated the utilities wanted to retain this alternative since it is cheaper than the others. One comment indicated that the use of ENTOMB should be prohibited for test reactors as well since they are generally in highly populous areas. In contrast, several commenters stated that the ENTOMB alternative should be left as a possible option and that in addition the 100-year period discussed in the Supplementary Information as the time period in which ENTOMB should be completed was too restrictive. Some commenters indicated that ENTOMB had certain advantages including reduced occupational exposure and waste volumes while some noted that no options should be precluded at this time due to the developing nature of decommissioning technology. (5, 9, 15, 17, 41, 44, 48, 49, 51, 52, 53, 54, 55, 56, 71, 78, 80, 82, 83, 86, 92, 95, 101, 102, 103, 104, 117, 123, 126, 134)

#### Comment Analysis and Response

The ENTOMB alternative for decommissioning has not been specifically precluded in the rule because there may be instances in which it would be an allowable alternative in protecting public health and safety and common defense and security. By not prohibiting ENTOMB the rule is more flexible in enabling NRC to deal with these instances. These instances might include smaller reactor facilities, reactors which do not run to the end of their lifetimes, or other situations where long-lived isotopes do not build up to significant levels or where there are other site specific factors affecting the safe decommissioning of the facility, as for example presence of other nuclear facilities at the site for extended periods. In addition there is potential for variations on the ENTOMB option where, for example, some decontamination has already been performed, thereby making the ENTOMB option more viable. Analysis of the ENTOMB alternative in the PNL reports (Refs. 1, 2) and in the GEIS (Ref. 20) indicates that it can be carried out safely and that it can have some benefit in the reduction of occupational exposure and waste requiring disposal.

As noted above, concerns were expressed by the commenters that the ENTOMB option would cause environmental damage due to the presence of long-lived radionuclides which would be radioactive beyond the life of any concrete structure, that it is inconsistent with the definition of decommissioning requiring unrestricted release, and that some reactors are located in highly populous areas. In addition, commenters noted that the Supplementary Information to the proposed rule indicated, in general, that there may be difficulties with the use of ENTOMB, in particular in demonstrating that the radioactivity in the entombed structure had decayed to levels permitting unrestricted release of the property in a period on the order of 100 years. In response, the rule contains requirements that a licensee must submit an alternative for decommissioning to the NRC for approval and that consideration will be given to an alternative which provides for completion of decommissioning beyond 60 years only when necessary to protect health and safety. This provides the Commission with both sufficient leverage and flexibility to ensure that if the ENTOMB option is chosen by the licensee it will only be used in situations where it is reasonable and consistent with the definition of decommissioning which requires that

decommissioning lead to unrestricted release. As indicated above, analysis of ENTOMB indicates that it can be carried out safely and with minimal environmental effect for the time periods presented in this NUREG and in the guidance under preparation. However, based on the difficulties with ENTOMB described in the Supplementary Information to the proposed rule and by the commenters, use of ENTOMB by a licensee would be carefully evaluated by NRC according to the requirements of the rule before its use is permitted. Regulatory guides currently in preparation will provide more guidance in this area.

One commenter indicated that the utilities wanted to retain this alternative because of its economics, however the NRC has evaluated ENTOMB with respect to protection of public health and safety and the relative economics of the utility is beyond the scope of this rule.



## C. Planning

### C.1 Clearer guidance for decommissioning process

#### C.1.1 Licensing scheme governing decommissioning unclear (for reactors)

##### Comment Summary

Several commenters found the proposed rule vague in the areas of what type of license is in effect during reactor decommissioning, how Part 70 applies to reactors during decommissioning, when the license terminates, definitions of terms, and procedural criteria for the termination process. Some of these commenters indicated that clarifications in these areas were important to assure meaningful public participation. One comment indicated that there might be loopholes which would be exploited by the industry resulting in adverse impacts to the public and the environment. One comment indicated that explicit procedural criteria would remove a needless burden on applicants and result in a more cost and time effective licensing process. (18, 33, 45, 49, 86, 92, 103)

##### Comment Analysis and Response

In response, it should be noted that application for termination of license occurs at the time of initiation of decommissioning which may be many years before actual termination of license is granted, that decommissioning is carried out under an amended license in accordance with the terms of a decommissioning order, and that the license is terminated only after the Commission is satisfied that decommissioning has been properly completed. Normally, an amended Part 50 license authorizing possession only will be issued prior to the decommissioning order to confirm the nonoperating status of the plant and to reduce some requirements which are important only for operation prior to finalization of decommissioning plans. The authority to possess radioactive materials under Parts 30, 40, and/or 70, as appropriate, continues to be incorporated in the modified Part 50 license, as it is during operation. Subsequent license amendments will be issued as appropriate. The Commission will follow its customary procedures, set out in 10 CFR Part 2 of the NRC Rules of Practice, in amending Part 50 licenses to implement the decommissioning process. In the past, the period of safe storage or that following entombment has been covered by an amended "possession-only" Part 50 license which does not authorize facility operation, with the term "order" used only in the case of a dismantling order, due to the more active nature of this stage of decommissioning. Except for the use of the term "decommissioning order," there has been no change from past practice. The term "decommissioning order" is used in lieu of the term "dismantling order" because, according to the amendments, the overall approach to decommissioning must now be approved shortly after the end of operation rather than an amended "possession-only" Part 50 license being issued without plans for ultimate disposition.

As with any license, the authority to operate or to carry on licensed activities ceases at the expiration date unless the license is being renewed. However, the license and the responsibility to protect health and safety and promote the common defense and security continues until the Commission terminates the license. Section 50.82 (f) clearly indicates that the license is terminated by a determination of the Commission after the decommissioning has been performed and it has been adequately demonstrated that the facility and site are suitable for release for unrestricted use. Because the decommissioning, including any change from the original operating license, requires Commission approval, there are no "loopholes" which would allow adverse impacts to the public or environment. The staff believes that the public will have adequate opportunity for meaningful participation; all guidance documents used in rule implementation are also available to the public.

"Decommission" is defined in § 50.2 of the amended rules (and in similar sections of Parts 30, 40, 70, and 72); all other words used in the amendments conform to their dictionary definition and need not be defined in § 50.2 or elsewhere.

For clarification, it is noted that the term "decommissioning plan" refers to the plan submitted at the time the licensee decides to terminate the license, while the term "decommissioning funding plan" refers to plan submitted early in facility life which indicates the licensee's financial assurance provisions.

## C.1.2 Clarifications concerning "permanent end of operation"

### 1. Comment Summary

One commenter was concerned that a reactor licensee would defer decommissioning after shutdown by continuing to renew the operating license unless the Commission were to specify criteria for permanent cessation of operations. (40)

### Comment Analysis and Response

It would be difficult if not impossible to specify criteria on what constitutes permanent cessation of operations, e.g., it would be unreasonable to put an arbitrary time limit on how long a reactor could be shut down before restarting. Any such action on the part of the Commission should be based on a case-specific determination concerning the safety of operating. Although some delay is possible, there are disincentives to any prolonged delay such as the cost of maintaining and renewing the license past the original expiration date and possible technological disincentives. With the financial assurance requirements of this rule in place, any extended delay would be even more unlikely, especially in conjunction with the regulation of funds by the State Public Utility Commissions and the Federal Energy Regulatory Commission. Finally, the use of SAFSTOR probably would eliminate any incentive to maintain an operating license unless possible future operation is anticipated.

As discussed in the Supplementary Information to the proposed rule, the amendments require decommissioning plans to be submitted by reactor facilities within two years following permanent cessation of operation or one year prior to operating license expiration. The decision as to whether a shutdown will be permanent is, of course, the licensee's. These amendments do not limit how long a licensee may have a facility shut down under its operating license but require only that when a facility is permanently removed from operational status, plans need to be made as to how the ultimate termination of license will be attained.

## 2. Comment Summary

One commenter suggested that the requirement for submission of decommissioning plans after the "permanent end of operation" should be modified in the case of where one license is expiring and another is still active at the same site. (126)

### Comment Analysis and Response

Although it may be desirable to await completion of all site "operations" before completing decommissioning of facilities on the site that cease operating earlier, as suggested by the commenter, the staff believes it is appropriate to consider the overall approach to decommissioning at the time each facility stops operating. The existence of another operating facility on the same site will frequently make SAFSTOR the most desirable alternative, but a decommissioning plan must be submitted so that the approach can be considered on a case-by-case basis and so that preparations for safe storage and procedures for safe storage are adequately planned. The details concerning the dismantlement may be deferred according to § 50.82(d) and § 72.38(c) and when determined appropriate on a case-by-case basis under Parts 30, 40, and 70.

## C.1.3 Criteria for decommissioning activities and license termination

### Comment Summary

Many commenters were concerned with the lack of specific requirements applicable to the process of decommissioning, particularly in the case of reactors, and suggested that strong guidelines on requirements for conducting and evaluating decommissioning plans and activities and terminating licenses are necessary to protect public, occupational, and environmental safety. Some suggest that the rule establish certain safety criteria and the ways in which the utility will meet these criteria. A few commenters were specifically concerned with clarifying requirements during the "safe storage" period, such as those for security, inspection, reporting, and monitoring. Many were not clear as to whether the suggested "guidance" should be in the rule or if Regulatory Guides would be considered appropriate. Two comments indicated that without more specific criteria for acceptability of decommissioning plans, the Commission would exercise little authority over licensee actions during decommissioning. They indicated that because Regulatory Guides are not binding, they would be inadequate to deal with specific safety issues. One comment indicated that the licensees could conduct decommissioning with "virtually complete

independence." Two comments indicated that the rule "assumed" that utilities would follow basic safety criteria. Two comments gave specific examples of requirements which should be included. One comment indicated more specific regulations were needed in order to evaluate whether or not a licensee complies with the law. One comment suggested that the Commission has been too apt to find exceptions to rules and that this has a negative effect on public confidence. (5, 9, 13, 15, 16, 18, 33, 39, 41, 47, 49, 51, 56, 57, 60, 72, 78, 79, 82, 86, 103, 119)

#### Comment Analysis and Response

Continuing authority to possess a reactor in a decommissioned status is governed by the provisions in 10 CFR Part 50 governing operating licenses, as appropriate. As discussed earlier, it is the intent of the rule to provide the necessary guidelines to assure that decommissioning is carried out in a manner which protects the public health and safety. To this end, the rule contains requirements that a decommissioning plan contain a description of the following: the choice of the alternative for decommissioning and the activities involved; the controls and limits on procedures and equipment to protect occupational and public health and safety; the planned final radiation survey; technical specifications and quality assurance and safeguards provisions in place during decommissioning, if appropriate; and a plan for assuring the availability of funds for decommissioning. Based on this requirement the licensee submits the necessary information to the NRC in the decommissioning plan. The NRC's evaluation of the information contained in this plan and the licensee's subsequent conduct of decommissioning activities is based on existing regulations applicable to reactors and other facilities undergoing decommissioning. These regulations include 10 CFR Parts 20, 50, 61, 70, 71, and 73.

Part 20 contains the basic standards for protection against radiation and is applicable to all licensees during operation as well as decommissioning, including the storage period. Part 20 contains requirements for limits on both occupational and public exposure, including limits on radiation exposure and concentrations of radioactive material in both restricted and unrestricted areas. In addition to the general limitations on exposure contained in Part 20, 10 CFR 20.1(c) indicates that radiation exposures, and releases of radioactive materials in effluents to unrestricted areas, should be as low as reasonably achievable (ALARA). Part 20 also contains, among other things, requirements on radiation monitoring, personnel monitoring, precautionary procedures, and reporting. Part 50, Appendix B contains broad requirements on quality assurance provisions which can be used as appropriate, to the extent commensurate with the safety functions to be performed by facility structures, systems, and components during decommissioning activities. Part 50 also contains guidelines on radioactive waste system design. Part 61 contains requirements on land disposal of radioactive waste including criteria for classification and characteristics of waste acceptable for disposal. Part 71 contains requirements for the packaging and transportation of radioactive material. Parts 70 and 73 contain requirements for physical protection of plants and materials. Although all of these parts do not specifically mention decommissioning activities, the criteria of these parts would apply, as appropriate, to decommissioning. In addition, regulatory guides, many of which

already exist and some of which are under consideration, can provide additional guidance for planning and conducting decommissioning in accordance with the applicable regulations. For example, Regulatory Guide 8.8 (Ref. 22) provides guidance on ensuring that occupational exposures are ALARA and Regulatory Guide 1.143 (Ref. 23) provides guidance on radioactive waste treatment systems. Also, as noted below in Sections B.4 and B.5, guidance is being considered on safeguards and on quality assurance provisions during decommissioning and on procedures to be considered for facilitating decommissioning by reducing radiation dose based on NUREG/CR-3587 (Ref. 24).

The primary means of protecting the health and safety of the public and workers during decommissioning is through implementation of the decommissioning plan. The decommissioning plan would contain the licensee's means for complying with parts of the regulations discussed above which are applicable to non-operating facilities.

All amendments to the operating license which the licensee holds at the time the decommissioning plan is submitted are subject to Commission approval. Amendments to the license are needed because many of the prescriptive requirements of an operating license are for the purpose of assuring safe operation and are no longer necessary during decommissioning. The decommissioning plan and the associated approval process provide an adequate legal framework for the regulation of facilities undergoing decommissioning. Therefore the licensee would not have independence in conducting decommissioning. The Commission does not merely assume the utilities will follow basic safety criteria. The licensing offices will review decommissioning plans based on the applicable criteria and guidance and the inspection and enforcement staff will monitor the carrying out of the plans. This approach should provide enough flexibility to accommodate the varied nature of activities which are possible.

The proposed rule has been modified to provide some additional detail on the scope of decommissioning plans in the final rule. A proposed Regulatory Guide on contents of decommissioning plans for materials facilities has been published; a similar Regulatory Guide for reactors is being developed to provide guidance on the information which should be submitted to conform to the rule. In addition, Regulatory Guide 1.86 provides guidance on conducting decommissioning activities, including storage periods, in a manner to meet applicable requirements. This Regulatory Guide is currently being revised to be fully consistent with the regulations. Regulatory Guides have been used successfully to provide uniform application of requirements while affording Commission staff flexibility to consider unique factors in any situation. In addition, the staff would use standard review plans (SRPs) which contain review procedures and the acceptance criteria used in evaluating licensee applications, including decommissioning plans. These SRPs would be available and contain the bases for the acceptance criteria. A standard review plan for review of reactor decommissioning plans is under development.

The specific procedures suggested in comment letters No. 47 and 103 need not be detailed in § 50.82, but are either required under Part 20 or considered "good practice" under the ALARA principle. Such procedures

will in any case be reviewed in decommissioning plans. (Some of these specifics are also discussed separately in other sections.) A regulatory guide detailing procedures to be considered for facilitating decommissioning, based on NUREG/CR-3587, is also being considered and would further contribute to minimizing doses.

Based on the above, the staff believes that the regulations provide adequate opportunity for informed public participation in decommissioning decisions and that more prescriptive regulations are not necessary. All important relevant information is available to the public.

In reference to the comment about exemptions, the need for an exemption often arises because a regulation was too prescriptive; since it is impossible to foresee all factors that may be relevant to a decision in the future, a too detailed rule may include specifics which are not appropriate to all situations; thus, an exemption becomes appropriate. Avoiding this need for requesting exemptions is desirable; one reason being that too many exemptions may indeed have a negative impact on public confidence as the commenter suggests.

#### C.1.3.1 Separate license, regulations, or regulatory department

##### Comment Summary

A few commenters suggested a new "decommissioning license" to cover facilities undergoing decommissioning. One said that this license would specifically address the utility's proposed plan for decommissioning and require NRC approval in a formal manner. Another stated that this license should require an application, an Environmental Report, a PSAR, and an FSAR. Four commenters suggested a new regulatory section to deal with all matters related to decommissioning in one comprehensive treatment so that the regulations applying to decommissioning would be clearly defined. Two referred to the Commission action of creating a separate part for well-logging operations and also indicated that the same approach would provide better guidance to licensees and to NRC staff. Another suggested a separate department charged just with decommissioning so that there isn't confusion with the regular licensing process. (45, 49, 72, 80, 86, 92, 103)

##### Comment Analysis and Response

An amendment to the Atomic Energy Act requiring Congressional action would be needed to institute a separate "decommissioning license." This legislative action would be of little value because the Commission already has the authority to regulate decommissioning without such a statutory change.

An application to terminate a license and commence decommissioning and an Environmental Report (in the form of a supplement to previous ER's) are required. As part of the decommissioning plan a safety analysis will be done. However, this safety analysis need not be in the form of changes to the FSAR because the FSAR deals primarily with the safety of operation. A PSAR is done only for a construction permit.

As discussed in the Generic Environmental Impact Statement on Decommissioning, NUREG-0586, (Ref. 20) development of a separate regulation

which specifically addresses decommissioning was considered in the rule-making. However, such a separate regulation covering different types of licensees would be cumbersome and confusing because it would need to contain many of the requirements already presented in 10 CFR Parts 30, 40, 50, 51, 70, and 72. Since decommissioning requirements are an integral consideration in nuclear facility licensing and operation, it is appropriate in terms of simplicity, efficiency, and reduction of regulatory burden, to amend the pertinent parts of the existing regulations to explicitly include appropriate decommissioning requirements. This rulemaking involves a very different situation than the well-logging rule which was referenced. That rule put all licensing requirements for one type of operation or licensee into one part which otherwise would be regulated by a number of parts. This decommissioning rule contains requirements for many types of licensees for various stages of licensing. Putting these requirements on decommissioning into the appropriate sections for each type of licensee consolidates the licensing requirements for these licensees. Hence it was decided to amend the existing regulations rather than prepare a separate regulation covering decommissioning.

Matters of the division of responsibilities within the Commission staff are not appropriately dealt with in the regulations. However, it is expected that the organizational structure at NRC licensing offices will adapt to deal with decommissioning reviews satisfactorily. For example, NRC has reorganized to deal with its changing function of formerly being an agency which primarily licensed new reactors to one now engaged primarily in the review and oversight of operating reactors and, in addition, has formed the Division of Low-Level Waste and Decommissioning in its Office of Nuclear Material Safety and Safeguards.

#### C.1.3.2 Addressing Wastes

##### Comment Summary

One commenter suggested that in writing more specific guidance for decommissioning planning in Section 50.82, mention should be made of the need to assess the impacts and risks associated with the radioactive wastes generated in the decommissioning process. (119)

##### Comment Analysis and Response

Although the decommissioning plan describes how the decommissioning is proposed to be carried out and this planning must consider the minimization of impacts and risks from decommissioning, the specific requirements for estimating impacts and risks, including those from wastes, are covered for all actions in Part 51 and thus need not be addressed in Section 50.82. The licensee's assessment of impacts is contained in the separate document, the environmental report, submitted along with the decommissioning plan.

#### C.1.4 Framework of safety goals

##### Comment Summary

Three commenters indicated that there should be a "framework of safety goals" for decommissioning paralleling existing regulations for nuclear

power plant operations, which could be met by a variety of means. Two of them indicated that this approach could provide flexibility in dealing with specific problems and that means of meeting goals could be suggested in Regulatory Guides. One specifically referenced Part 50, Appendix A. (56, 86, 103)

#### Comment Analysis and Response

This "framework of safety goals" has to do primarily with the safe operation of the reactor; Appendix A contains general design criteria which, when met, assure that a reactor is designed for safe operation. When operation has ceased permanently, all of these considerations do not apply. The facility becomes similar to any facility where large amounts of radioactive material are confined. The general framework of requirements to protect workers and the public from exposure to radioactive material still apply and are discussed above in Section C.1.3.

#### C.1.5 Major decommissioning activity

##### Comment Summary

One commenter noted that it was unclear what activities should not be started prior to approval of decommissioning plans. Other commenters requested that the regulations be clarified in order to delineate those activities related to decommissioning that could proceed without approval of the decommissioning plan if those activities are allowed by the operating license and § 50.59. (60, 61, 104, 123, 126).

##### Comment Analysis and Response

It is assumed that the first commenter was also primarily or exclusively concerned with a clarification in Part 50. Parts 30, 40, and 70 contain more specific criteria in this regard. In response it should be noted that § 50.59 permits a holder of an operating license to carry out certain activities without prior Commission approval unless these activities involve a change in the technical specifications or an unreviewed safety question. However, when there is a change in the technical specifications or an unreviewed safety question, § 50.59 requires the holder of an operating license to submit an application for amendment to the license pursuant to § 50.90. Section 50.59(a)(2) contains criteria as to what is deemed to be an unreviewed safety issue. The amendments contained in this rulemaking do not alter a licensee's capability to conduct activities under § 50.59. Although the Commission must approve the decommissioning alternative and major structural changes to radioactive components of the facility or other major changes, the licensee may proceed with some activities such as decontamination, minor component disassembly, and shipment and storage of spent fuel if these activities are permitted by the operating license and/or § 50.59. These matters will be further discussed in a revision to Regulatory Guide 1.86 under consideration.

## C.1.6 Requirements applicable to "possession-only license"

### Comment Summary

One commenter suggested that clearer guidance was needed on what restrictions and requirements apply to a "possession-only license." Two commenters specifically recommended codifying the "possession only" license in the regulations so as to clarify the timeframe for reducing such requirements as Security Plan, Emergency Plan, and Operator Requalification Training. (60, 98, 112)

### Comment Analysis and Response

As discussed above in Section C.1.3, certain requirements such as the radiation protection requirements of Part 20 apply to all licensees and the requirements of Part 50 and all parts containing requirements pertaining to nuclear reactor operating licenses are applicable to "possession-only licenses" except that many of these are relevant only to actual operation which is no longer permitted. The extent to which specific license conditions and technical specifications will be reduced under a possession-only license will continue to be determined on a case-by-case basis depending on the planned condition of the facility during any storage period within the context of the applicable regulations and regulatory guidance.

## C.1.7 Total exposures and releases

### Comment Summary

One commenter was concerned because there are no standards for total worker exposure, total public exposure, and total amount of releases. (93)

### Comment Analysis and Response

Specifics regarding radiation standards are outside the scope of this rule-making. The approach to radiation and environmental protection used in the Commission's regulations in 10 CFR Parts 20 and 50 is to put limits on individual doses and consider total impacts when considering the total cost and benefit of a particular action. Total impacts of decommissioning are considered by the NEPA process as delineated in Part 51. These impacts are minimized through the detailed planning required by § 50.82.

## C.1.8 Occupational exposure during decommissioning

### 1. Comment Summary

Many commenters emphasized the importance of worker protection. Many of these suggested more specific criteria to minimize worker exposure. A number were concerned that the rule did not specifically address radiation monitoring. One indicated that reporting of all phases to NRC should be required. One felt that strict enforcement of safety standards should be required, and also indicated that experience at TMI and Shippingport would indicate that total occupational exposures are apt to be substantially

higher than estimated. Another believed that exposures during decommissioning will be substantially higher than from operations. One commenter was concerned about the problems of "sponges" or "jumpers." One commenter (as discussed under C.1.3) suggested specific requirements such as training of workers prior to work in highly radioactive areas. (5, 15, 18, 39, 41, 44, 47, 48, 49, 55, 56, 57, 72, 79, 80, 82, 86, 92, 103)

#### Comment Analysis and Response

Minimizing worker exposure during decommissioning is one of the main goals of this rulemaking and of the guidance being developed in connection with this rulemaking. Detailed plans for decommissioning are the primary means of minimizing worker exposure. Procedures for carrying out decommissioning will be evaluated by NRC staff for adequacy of occupational exposure control; plans for appropriate training are an area of review. Basic radiation protection, monitoring, and reporting requirements need not be developed specifically for decommissioning because generally applicable criteria are already contained in 10 CFR Part 20. The radiation levels to which workers will be exposed will be similar to levels of major maintenance activities conducted during operations. If total exposures prove to be higher than estimated, this could be factored into decisions concerning alternatives and approaches in the future. Also contributing to the minimization of worker exposure are the recordkeeping requirements of this rule. Other aspects of facilitation of decommissioning will be considered in the review of license applications.

With regard to recordkeeping, consideration of these comments has resulted in modifying the proposed rule to clarify that drawings be kept of restricted areas when radioactive materials are present and that records of spills at material facilities be limited to instances where contamination remains after cleanup procedures. The regulations provide a legal basis against which enforcement can be carried out.

#### 2. Comment Summary

Two commenters suggested that NRC should require that representatives of workers be involved in the creation of the decommissioning plans and procedures. (86, 103)

#### Comment Analysis and Response

Engineers with knowledge about the types of work required for decommissioning will be involved in the planning. Some of these also will probably be involved in the execution of the plans. It is not practical nor necessary for actual representatives of workers to be involved in developing decommissioning plans. Overall plans probably would be developed before staff selection, especially in the case of contractors. The regulations, such as 10 CFR Part 20, and the planning process include a program to assure adequate training and provide for the protection of workers.

### C.1.9 Standards for radiation monitoring and protection

#### Comment Summary

One commenter suggested that strict standards for radiation monitoring must be established until it is clear that releases will be as low as anticipated. Another suggested that new security and radiation monitoring systems should be installed for decommissioning. (49, 103)

#### Comment Analysis and Response

As indicated above, generally applicable radiation protection and monitoring requirements are contained in Part 20. Any modifications to existing security and monitoring systems which may be appropriate will be proposed and reviewed in the decommissioning plan.

### C.1.10 Registry of workers

#### Comment Summary

A number of commenters suggested that a registry or recordkeeping system be established to keep account of exposures of decommissioning workers. One suggested specifically that a retrievable history be recorded under the individual's social security number to prevent another "sponge" controversy. Two commenters indicated that such records were also important for compensation purposes arising from wrongful death suits in the future. (9, 15, 18, 39, 41, 48, 52, 55, 57, 71, 86, 92, 103)

#### Comment Analysis and Response

Such a registry of workers would not be valuable unless it recorded exposures from all types of work not exclusively those from decommissioning work. Reporting and recordkeeping requirements designed to minimize possible overexposure are contained in 10 CFR Part 20. Consideration of a more comprehensive recordkeeping system is outside the scope of this decommissioning rulemaking.

### C.1.11 Methods of blasting and cutting of components

#### Comment Summary

Some commenters were specifically concerned that appropriate procedures be used for such activities as blasting, cutting, and waste packaging. (9, 47, 79, 103)

#### Comment Analysis and Response

Although not specifically required by NRC, blasting would have to be done by people qualified for such activities. The licensee would have to meet any applicable requirements other than those of NRC, such as the requirements imposed by the Occupational Safety and Health Administration (OSHA). All major activities will be reviewed by NRC with regard to adequate control

of radioactivity. Also, the decommissioning plan must include appropriate training programs about radiological safety for workers involved in decommissioning.

#### C.1.12 Safeguards and other specific areas

##### Comment Summary

One commenter pointed out specific requirements whose applicability to decommissioning is unclear, namely: safeguards, site emergency planning, operator training, and plant staffing requirements. (60)

##### Comment Analysis and Response

As noted in Section C.1.3, the existing regulations on safeguards for nuclear facilities are considered to contain criteria applicable to the decommissioning process. Therefore, it is not considered necessary to amend those regulations. However, the Commission has modified the proposed rule to indicate that safeguards provisions during decommissioning are to be described, as appropriate, in the decommissioning plan. In addition, appropriate guidance documents will be issued identifying which of the current operating requirements on safeguards are to apply during decommissioning. Also as noted in Section C.1.3, other applicable regulations will apply to other areas discussed.

#### C.1.13 Packaging, shipping, and burial of wastes

##### Comment Summary

A few commenters were particularly concerned with standards for packaging, transportation, and burial of radioactive wastes. One of these indicated that packaging and shipment should be conducted to minimize occupational exposures and reduce cross contamination of clean areas. (41, 79, 103, 119)

##### Comment Analysis and Response

Although requirements for packaging, transportation, and burial of wastes are highly important to decommissioning, there is no need for additional specific requirements specific for these procedures when connected with decommissioning. These matters are already covered by existing NRC and DOT regulations (see, for example, 10 CFR Parts 60, 61, and 71) which have been determined to be adequate to protect public health and safety. Relevant parts of the requirements in Parts 60, 61, and 71 are applicable for the decommissioning as well as the operational phase. (See Section H.1 of this NUREG) In regard to the specific comment, the concept of ALARA in 10 CFR Part 20 would be applied in both the development and review of decommissioning plans.

#### C.1.14 Decommissioning plans and waste disposal and ALARA

##### Comment Summary

One commenter suggested that licensees should be required to minimize waste quantities to levels "as low as reasonably achievable" and to show that the wastes will be accepted at appropriate disposal sites. (86)

### Comment Analysis and Response

The decommissioning plan will be reviewed as to the adequacy of plans for waste handling and disposal based on criteria in 10 CFR Parts 60 and 61 and existing disposal capacity. More details regarding this comment are contained in Section H.1.

#### C.1.15 Delays in shipping wastes

##### Comment Summary

Two commenters indicated that the decommissioning plan should show how the decommissioning activities would be affected should there be a delay in the shipping of wastes. (86, 103)

##### Comment Analysis and Response

As discussed in the Supplementary Information to the proposed rule, the decommissioning plan would have to describe procedures for handling and disposal of waste which would consider any delays which could be foreseen such as delays caused by the unavailability of disposal facilities. The plan would include the safe handling and control of the wastes on site; such controls would remain in effect until the wastes are disposed. Thus, the plan would protect public health and safety in the event of unforeseen delays, especially in the short term. Long term unforeseen delays are unlikely, but, if they occur, the decommissioning plan could be modified as appropriate.

#### C.1.16 Criteria for decontamination under § 30.36(c)(1)(ii)

##### Comment Summary

One commenter indicated that the words "remove contamination to the extent practicable" in § 30.36(c)(1)(ii) and comparable sections in Parts 40 and 70 are not adequate to quantify the extent to which decontamination should be performed. A limit or standard such as 100 dpm/100 cm<sup>2</sup> is suggested. (119)

##### Comment Analysis and Response

If the commenter is concerned with the lack of specific residual radioactivity limits in the regulations, this subject is discussed in Section E of this NUREG. However, the reference to Section 30.36(a)(1)(ii) (and comparable sections in Parts 40 and 70) is not intended as a standard for termination of license. The standard for termination of license (contained in § 30.36(d)) is that the premises be suitable for release for unrestricted use and that the information submitted be adequate to demonstrate that fact. Although a quantification of this standard in the regulations has yet to be developed, some guidance exists in this area as discussed further in Section E. Paragraph 30.36(c)(1)(ii) requires the licensee to decontaminate to the extent practicable prior to expiration of the license. In most cases, this will mean completion of decontamination so that the survey required in § 30.36(c)(1)(v) may serve as the final radiation survey. If,

instead, the licensee were required to complete decontamination prior to license expiration, the licensee might be forced to cease licensed activities sooner than desired even though the license has not yet expired and also the licensee might end up in violation of the requirement even though a conscientious attempt had been made to complete decontamination. For those cases where a decommissioning plan is required, § 30.36(c)(1)(ii) serves to tell the licensee to proceed with any decontamination activities which are practical and not covered by § 30.36(c)(2)(i) rather than wait for approval of the decommissioning plan.

## C.1.17 Accidents

### 1. Comment Summary

Three commenters were concerned about the handling of decommissioning at a plant after an accident. Two commenters indicated that the rule does not establish any special requirements for decommissioning after an accident where the work is most dangerous and costly. One commenter indicated that accident situations must be handled on a case-by-case basis. (86, 92, 103)

### Comment Analysis and Response

The rule provides a framework for the regulation of decommissioning which is adequate for decommissioning after normal operations or after an accident. This flexibility allows for case-by-base considerations which are especially important in dealing with an accident situation. The funding assurance requirements do not address accidents because they are covered by existing § 50.54(w) (and were noted as being under consideration in a separate rulemaking for materials licenses). Section 50.54(w) requires electric utility licensees to obtain onsite property damage insurance and stipulates the levels of insurance coverage to be obtained. The purpose of that insurance is to cover decontamination and cleanup costs associated with the property damage resulting from an accident and is expected to cover the accident cleanup during which the major portion of contamination resulting from the accident is cleaned up and the associated wastes are processed. As discussed in the Supplementary Information to the proposed rule, a study done by Battelle Pacific Northwest Laboratory (NUREG/CR-2601, Ref. 7) indicated that, once the accident cleanup activities are completed, the technology exists to accomplish the decommissioning and that safety and costs of decommissioning following the accident cleanup do not vary significantly from that following normal operations. The accident cleanup period itself is outside the scope of this rulemaking.

### 2. Comment Summary

One commenter indicated that the impacts and risks of accidents related to decommissioning need to be addressed. (119)

### Comment Analysis and Response

The impacts of potential accidents during decommissioning have been evaluated in the Generic Environmental Impact Statement on Decommissioning (NUREG-0586) (Ref. 20) developed in connection with the rulemaking.

These impacts will be considered further by the licensee and NRC on a case-by-case basis as appropriate under 10 CFR Part 51.

## C.2 Timing of plan submittals

### C.2.1 Preliminary plans

#### Comment Summary

Some commenters indicated that it was important that there be preliminary planning for decommissioning at an early stage. One commenter mentioned some specific facilitation techniques. One commenter thought that preliminary planning should begin immediately following commencement of operation; the others that it should be done at the design stage. One commenter noted that the "preliminary plan" is properly limited in scope to funding. (18, 22, 30, 95, 103, 110)

#### Comment Analysis and Response

Preliminary planning is important and should be appropriate for each stage of licensing. Some consideration of decommissioning should take place in developing designs prior to issuance of OL; this is discussed further under C.8.

### C.2.2 Timing of final decisions

#### Comment Summary

One commenter gave a general comment that maximum flexibility should be provided so that decisions on decommissioning can be made near the end of operation. Another commenter was very concerned that the updated cost estimate required 5 years before the projected end of operation would require much more detail than an assessment of the technical situation could reasonably provide at that time and such plans would involve premature commitments. One commenter specifically indicated agreement with the scope of both preliminary and final planning. (22, 30, 105)

#### Comment Analysis and Response

The staff agrees that the rule should provide flexibility; the amendments require no final decisions or commitments concerning approaches to decommissioning until submittal of decommissioning plans at the end of operation. Section 50.82(b) requires that the decommissioning plan indicate the choice of decommissioning alternative to be used. The purpose of the cost estimate submitted in the preliminary decommissioning plan 5 years prior to the projected end of operation is to provide an up-to-date cost estimate on which to base financial assurance so that the amounts being assured by the funding method will reach a level at the end of life which is approximately equal to the actual cost of decommissioning. In particular, this submittal would be based on an up-to-date assessment of the major technical factors that could affect decommissioning planning and would assure that licensees consider relevant up-to-date information which could be important to adequate planning and funding for decommissioning well before decommissioning actually begins. The factors to be considered in submitting this information include

the decommissioning alternative anticipated to be used, major technical actions necessary to carry out decommissioning safely, the current situation with regard to disposal of radioactive wastes, residual radioactivity criteria, and other site specific factors which could affect decommissioning planning and costs. As discussed in more detail in Section D.2 of this NUREG, this requirement is an important part of providing reasonable assurance of the availability of funds for decommissioning. This requirement serves to assure that financial assurance will be based on cost estimates which have been estimated on the basis of a technical review while a few years remain to make adjustments and that preliminary planning is adequate to avert potential problems.

### C.2.3 Timing of final plans

#### Comment Summary

A few commenters were concerned about the timing of decommissioning plans. One commenter questioned the meaning of the recommendation to submit plans in a timely way prior to initiation of major activities to avoid delays. One commenter recommended requiring plans one year prior to planned termination. One commenter was concerned that too long a time would pass while no plan had been prepared because planning is triggered by the licensee's decision to terminate operation. Another commenter suggested that up to 5 years after the end of operation be allowed for submittal of plans so that more complete information can be obtained after shutdown and more effective plans developed. (81, 95, 110, 132)

#### Comment Analysis and Response

The concerns of these commenters were considered in developing the proposed rule and the staff still believes that the requirement that decommissioning plans be submitted two years after shutdown is appropriate. It would be desirable to have plans submitted one year before shutdown, but it is not always possible for final shutdown to be anticipated. One comment suggested that the unprogrammed shutdown was overlooked. On the contrary, unprogrammed shutdown was the primary consideration in choosing the two-year time limit. In addition, however, a submittal one year before shutdown is recommended, so that the review process will be unlikely to delay implementation. The question of which activities would continue and which should await approval was discussed under Section C.1.5. A reasonably complete overall plan for decommissioning can be developed before shutdown, or within two years if shutdown were not anticipated. It is expected that, particularly in the case of plans developed before shutdown, additional information will be submitted to supplement or modify the decommissioning plan; for example, some of the sampling to determine levels of contaminants can only be done after permanent shutdown. The proposed rule has been modified to specifically require that about 5 years prior to projected end of operation a licensee must submit a preliminary decommissioning plan containing a cost estimate for decommissioning and an up-to-date assessment of the major technical factors that could affect planning for decommissioning.

### C.3 Previous approvals

#### Comment Summary

One commenter suggested that the description of "controls and limits on procedures and equipment to protect occupational health and safety" (proposed 50.82(b)(2)) should only have to address those required or changed as a result of decommissioning, that is, that programs or procedures in place which will continue should require no further review and approval. (60)

#### Comment Analysis and Response

Whether or not the regulations request only changes to a program or procedure, the licensee may use references, if they are clear and specific, to previous submittals to avoid repeating information. Some parts of the decommissioning plan will change existing procedures or programs. Previously approved procedures, programs, and equipment which remain unchanged during decommissioning will not undergo further review and approval.

### C.4 Decommissioning Plans

#### C.4.1 Quantification of criteria for submitting decommissioning plans for Parts 30, 40, and 70 licensees

##### Comment Summary

One commenter suggested quantification of the term "significantly greater" used in the criteria for which Parts 30, 40, and 70 licensees must submit a decommissioning plan in § 30.36(c)(2)(i) and comparable sections of Parts 40 and 70. (119)

##### Comment Analysis and Response

Although the criteria for determining which Part 30, 40, or 70 licensees should submit a decommissioning plan do not contain numerical guidelines, the proposed rule has been modified to stress the need for a plan submittal if procedures not applied routinely during maintenance or cleanup operations are used. If a licensee desiring to terminate his license is unsure as to whether a decommissioning plan should be submitted, he should consult with the licensing staff. The large majority of Parts 30, 40, and 70 licensees will be able to proceed with decommissioning without NRC approval. In all cases, the Commission will review information on residual radioactivity and make a determination on terminating the license based on existing criteria for residual radioactivity. (More detail regarding residual radioactivity is contained in Section E of this NUREG.)

#### C.4.2 Separation of decommissioning plan and application for termination of license

##### Comment Summary

One commenter suggested that a decommissioning plan should be allowed to be submitted independently from an application for termination of license. (132)

### Comment Analysis and Response

The commenter does not indicate the purpose of this suggestion or how the licensing process might proceed in this case. Thus, an explanation of why the regulation is written as it is, is presented here. The proposed decommissioning plan essentially constitutes the initial application for termination of license. Consistent with the definition of decommissioning, the licensee is applying to carry out those procedures necessary to obtain termination of license. In fact, at least one submittal, the final survey report, will have to be made after this initial application prior to the Commission granting termination of the license. Although, the terminology "application to decommission" may have been somewhat clearer, the terminology "application for termination of license" has been retained at the time of submittal of plans rather than at the time of submittal of survey reports in part to be consistent with previous usage and to be consistent with the use in Parts 30, 40, and 70 where such terminology is essential to the structure of the termination sections.

If the commenter is concerned with being able to take a facility out of service without terminating all licensed activities, this is possible under the regulations. As explained in the Supplementary Information to the proposed rule, such action is not considered full decommissioning; submittals would consist of applications for amendment of license or for a new license.

#### C.4.3 Different plans for decommissioning

##### Comment Summary

One commenter suggested that the individual licensee be allowed to submit different plans for decommissioning to NRC for approval. (97)

##### Comment Analysis and Response

The intent of the commenter is not clear. Each licensee (for reactor or other major facility) must submit a decommissioning plan to NRC for approval. The selection of a decommissioning method is the responsibility of the licensee. If the licensee finds it necessary to change the decommissioning plan, a substitute, revised, or amended plan should be submitted for review. Independent of this, the method for decommissioning must be consistent with the definition of decommissioning in the regulations, that is, the method would have to include eventual decontamination to levels suitable for release for unrestricted use.

#### C.4.4 Need to demonstrate safety of decommissioning

##### Comment Summary

One commenter suggested that reactor licensees should not have to demonstrate that decommissioning can be accomplished safely in the decommissioning plan. (99)

### Comment Analysis and Response

The general standard for acceptability of decommissioning plans (for reactors) is contained in § 50.82(e). The licensee need not demonstrate that in general decommissioning can be carried out safely but that this particular decommissioning will be carried out safely, that is, the licensee must describe his plan for decommissioning sufficiently that the Commission can judge whether reasonable approaches to assuring safety are planned.

#### C.4.5 Decommissioning plan - condition of license

##### Comment Summary

One commenter indicated that the decommissioning plan should not be a license condition but submitted subsequent to issuance of the operating license. (99)

##### Comment Analysis and Response

The decommissioning plan is not a condition of license of the operating license because the plan is not required until the end of operation. As noted in amended 10 CFR Section 50.82, a licensee is required to submit a decommissioning plan following permanent cessation of operations. Once the Commission approves the plan, it will issue an order authorizing the decommissioning.

#### C.5 Provisions if decommissioning plan not approved

##### Comment Summary

One commenter was concerned about what would happen if the decommissioning plans were not approved. (60)

##### Comment Analysis and Response

If the decommissioning plan is not approved the licensee cannot proceed to decommission the facility. The facility would remain under license and be subject to continuing NRC regulation. It is expected that in all cases it should be possible to work out an acceptable decommissioning plan in consultation with Commission staff. As with other submittals of information, the Commission may request additional information if that submitted does not satisfy the requirement. If necessary, modifications might be required. Planned regulatory guidance which is being developed would reduce the need for redrafting plans.

#### C.6 Quality Assurance during decommissioning

##### Comment Summary

Many commenters were concerned that the proposed regulation did not include mention of quality assurance and/or quality control for decommissioning. Some of these indicated that QA/QC requirements need to be clearly specified. A few commenters indicated the need for a separate or

independent QA/QC staff. Two commenters suggested some specific procedures which should be subject to Q/A. Two others refer to problems with decontamination activities at Saxton because of lack of QA. (5, 13, 18, 33, 44, 51, 55, 56, 57, 58, 60, 72, 78, 80, 82, 86, 92, 103)

#### Comment Analysis and Response

The Commission agrees that quality assurance is important for decommissioning. The intent to include QA in decommissioning plans was mentioned in the Supplementary Information to the proposed rule, but the scope of plans in the regulation itself was very general. The final rule indicates that QA provisions during decommissioning are to be described, as appropriate, in the decommissioning plan. A large part of the QA program for operating reactors pertains to equipment and procedures necessary for the safe operation of the plant; the equipment and procedures requiring QA procedures during decommissioning is much more limited. It is not considered necessary to detail these requirements in the regulations because of the limited nature of the QA requirements. As noted above in Section B.2 information in the decommissioning plan would describe QA provision as they comply with 10 CFR 50, Appendix B to the extent commensurate with the safety functions to be performed by facility structures, systems and components during decommissioning activities. Guidance is being considered to assist in the development and review of the quality assurance provisions of the decommissioning plans.

### C.7 Recordkeeping

#### C.7.1 Need for recordkeeping

##### Comment Summary

Commenter opinions concerning the recordkeeping requirements proposed was mixed. A few thought it was important enough to include specific support for the requirements as proposed indicating why such records were important. Other commenters indicated that existing recordkeeping requirements are sufficient. Many of these felt that the proposed requirements were redundant or too specific, or both. One commenter suggested that records might be limited to those events resulting in the spread of contamination outside of radiologically controlled areas identified in the updated FSAR. (22, 29, 31, 53, 76, 95, 96, 103, 104, 105, 123, 126)

##### Comment Analysis and Response

The Commission is retaining recordkeeping requirements for decommissioning. Experience has shown that incomplete knowledge of facility design and history can result in significant difficulties and greatly underestimated costs at the time of decommissioning. Although many of the records, particularly in the case of reactors, would be kept for other purposes, it is expected that an improvement in assurance of availability of the records will result from the amendments. The amendments have been written to minimize the additional effort required, that is, requiring only centralized reference to pertinent records and their location rather than duplication of the records, and not requiring that each relevant document be indexed individually. As noted in Section C.1.8.1, the proposed rule has been

modified to clarify that drawings be kept of restricted areas where radioactive materials are present and that records of spills at materials facilities be limited to instances when contamination remains after cleanup procedures.

#### C.7.2 Recordkeeping as license condition

##### Comment Summary

A number of commenters were concerned that requiring recordkeeping as a condition of license would cause problems and that it was not necessary for it to be a license condition for reactors since such a requirement was not important to safe operation. Some thought that a change to recordkeeping procedures could be construed as an amendment of the operating license. A few indicated that there would be problems if the Commission chose to modify the requirement referring to the case of changing the compliance deadline for environmental qualification. Many pointed to the fact that Commission enforcement authority would not be reduced if such requirements were regulations but not license conditions. Some suggested eliminating the requirement, possibly including it in guidance; others, that it be in the regulations but removed from § 50.54 for license conditions, or that it be clarified that changes to the program would not constitute a license amendment. (23, 31, 61, 102, 104, 105, 114, 118, 132, 134)

##### Comment Analysis and Response

The Commission has considered these comments in the light of the need to provide protection of health and safety during the decommissioning process and, in response, in order to build flexibility into the rule has modified the proposed rule to make the recordkeeping requirements a specific regulatory requirement in Section 50.75 instead of a license condition. Adequate enforcement capability is retained since records will have to be available for inspection.

#### C.7.3 Records made public

##### Comment Summary

One commenter suggested the records important to decommissioning be made public. (95)

##### Comment Analysis and Response

A large portion of the records would be available to the public in the Commission's public document room to the extent they have been submitted as part of an application or under any reporting requirement such as reportable occurrences or as part of a decommissioning plan.

#### C.7.4 Indexing of records

##### Comment Summary

One commenter suggested that the indexing of documents be required to enhance the goal of accessibility. (95)

## Comment Analysis and Response

The amendments require licensees to keep records important to decommissioning. These records include records of spills or other unusual occurrences and also include as-built drawings and modifications of structures and equipment. The amendments indicate that if required drawings are referenced, each relevant document need not be indexed individually. This means that a licensee can reference a category of drawings of a particular area for example and need not index each one separately. Considering the very large number of drawings at a facility such as a power reactor, this provision is considered to provide reasonable capability of retrieval and accessibility at the time decommissioning is being planned without imposing undue burden. Some filing system would likely be necessary in practice in order that drawings of various portions of the facility can be located.

### C.7.5 Records during SAFSTOR

#### Comment Summary

One commenter suggested that the regulation should be more specific so that the information continues to be available at the time of deferred dismantlement in the case of SAFSTOR. (103)

#### Comment Analysis and Response

Because the facility maintains a modified Part 50 license, the requirement for recordkeeping applies until termination of license and records would have to be maintained and updated as appropriate during SAFSTOR. Revised Regulatory Guide 1.86, being developed, will include reference to these requirements.

### C.8 Facilitation

#### Comment Summary

Some comments were submitted concerning facilitation of decommissioning. The commenters favored consideration of facilitation except for one who indicated that additional plant design requirements and operating procedures to facilitate decommissioning are not necessary. One commenter indicated that techniques for worker protection such as robots and remote devices should be developed. Another commenter discussed how design facilitation and improvements in the technology of decommissioning (such as robots and remote devices) can reduce the costs, time, and exposures at decommissioning; this was as part of discussion arguing that the rate of escalation used in the certification option for utilities was too high. Two commenters recommended that specific requirements for facilitation of decommissioning in design and operating procedures be included in the regulations. (41, 56, 61, 103, 142)

#### Comment Analysis and Response

In preparing the proposed rule, the Commission did not conclude that additional plant design requirements and operating procedures to facilitate

decommissioning are unnecessary but rather that, other than recordkeeping, no specific design feature nor operating procedure need be required specifically for all licensees at this time. As noted in the Supplementary Information to the proposed rule, although no specific requirements are being imposed at this time, the effects of facilitation on design of facilities and operational procedures can be considered under general criteria contained in existing regulations in 10 CFR Parts 20, 30, 40, 50, 70, and 72. To the extent that design features or operational techniques are of known value in facilitating decommissioning, the Commission staff may consider these factors in reviewing applications for construction permits or operating licenses under the more general criteria contained in the regulations. The remarks of commenter 142 would support the view that the industry has an interest in the development of improved designs and techniques for decommissioning because of the economic benefits. The Commission has completed some preliminary studies to identify possible beneficial features and techniques (NUREG/CR-3587).

## C.9 Shutdown reactors

### Comment Summary

A number of commenters were concerned about the exemption of reactors permanently shut down prior to issuance of the rule from the requirement to submit decommissioning plans. Some thought that this would mean a lower level of protection for the public living near such a plant. One commenter suggested that those licensees be required to review their plans within a set time after the effective date of the rule and submit any revisions necessary to make their plans consistent with the new regulations. Two commenters suggested an exemption procedure in the regulations would be better than a blanket exemption. (40, 51, 56, 58, 67, 78, 81, 86, 95, 103)

### Comment Analysis and Response

Reactors which are permanently shut down prior to the effective date of this rule, have had their status reviewed by applying for a possession-only license (a few had obtained a materials license only). These plants are being adequately controlled under their modified license and license conditions to protect the health and safety of the public while in this decommissioning mode. Any further delay in completion of decommissioning would have to be considered formally if an extension is requested beyond the expiration of the possession-only license. Detailed plans for ultimate dismantlement of reactors currently in safe storage would be deferred under the provisions of this rule. Requiring a decommissioning plan for these reactors at this time, or an application for exemption, would all involve administrative efforts on the part of these licensees with no significant impact on health and safety. Funding and recordkeeping requirements in the amendments apply to these reactors since they possess an "operating license" albeit modified. Details concerning financial assurance, primarily the time period for accumulating funds not set aside during operation, would be decided on a case-by-case basis.

## C.10 Advanced planning for deferred dismantlement

### Comment Summary

One commenter recommended that advance planning for delayed dismantlement should be required in the case of SAFSTOR. The primary concern appeared to be the need to adjust funding levels. (95)

### Comment Analysis and Response

The rule provides that planning for deferred dismantlement at the time of cessation of operations may be less detailed with detailed planning to occur at the appropriate time. This initial planning would be sufficient to establish reasonable assurance of funding during the storage period. Cost estimates and funding levels are required to be reviewed and adjusted as necessary over the storage period. This level of advance planning is considered appropriate.

## C.11 Consolidated plans for multiple licensees

### Comment Summary

One commenter was concerned that, in the case of licensees having materials licensed under more than one part of 10 CFR and used within common facilities, the rule would require a separate decommissioning plan for each license and recommended that a consolidated plan be allowed. (53)

### Comment Analysis and Response

In some cases where byproduct, source, and/or special nuclear material are used in the same facilities, it would be very difficult to develop separate decommissioning plans for terminating each license, in particular where there is interdependence of facilities, operations, or projected decommissioning activities. Consolidated plans based on a combined analysis of the facility decommissioning would be permitted. This would also be the case for some funding plans. If a licensee operates multiple independent facilities and/or sites under a single license, a consolidated decommissioning plan or funding plan would have to delineate procedures and cost estimates for each facility/site. The regulatory guides currently under consideration would include further details concerning these situations. The rule is broad enough to encompass these situations.

## D. Financial Assurance

### D.1 Cost of decommissioning

#### D.1.1 Costs of power reactor decommissioning

##### 1. Comment Summary

A number of commenters questioned the Battelle Pacific Northwest Laboratory (PNL) estimates of the cost of decommissioning as discussed in the Supplementary Information to the proposed rule while a few agreed with the level of funding indicated in the rule. A variety of alternative estimates and reasons for questioning the estimates were given. A summary of these listed below. (1, 9, 11, 14, 15 18, 31, 33, 34, 36, 37, 44, 45, 47, 49, 51, 53, 55, 57, 58, 59, 61, 68, 72, 79, 80, 81, 82, 86, 88, 95, 103, 111, 126, 129, 131, 138, 140, 141)

- (a) Commenters indicated that other estimates have been made which make the PNL studies appear to be too low. Commenters from the nuclear industry indicated costs are more likely in the range of \$126 to \$178 million. Other commenters cited estimates which range from \$600 million to as high as \$3 billion. The variety of estimates are cited by some commenters as being indicative of the uncertainty of estimates. One commenter indicated that the estimates in the PNL studies were high.
- (b) The data base of the PNL reports is limited because the reports are based on small research reactors and on the Elk River reactor. In particular, Elk River and Saxton operated at low power loads and for only a very short time, not long enough for long-lived radionuclides to build up. Thus, necessary experience to make accurate cost estimates does not exist and commenters quote the PNL reports as stating that "extrapolations from these experiences to large commercial reactors are considered to be generally unreasonable." Moreover commenters stated that the PNL studies are outdated. Some commenters point out that certain necessary data for estimating costs does not exist. These data include information on concrete contamination, activated vessel components and biological shield and soil contamination and uncertain status of requirements regarding occupational dose, waste disposal, and residual radioactivity.
- (c) Shippingport, a 65 MWe reactor, has been estimated to cost \$98 million to decommission. Larger reactors would likely cost significantly more than this, perhaps more than three times as much. In addition, Shippingport cost estimates are probably lower than typical because the reactor vessel will be removed intact and the wastes will be disposed of in a Federal Repository. Other estimates at Saxton and Humboldt Bay (which the commenters indicated as being \$600 million in 2015 dollars) indicate PNL estimates are too low.

- (d) Estimates of costs of other activities such as reactor construction, TMI-2 cleanup, and Saxton decommissioning have been greatly underestimated. Costs of decommissioning will likely escalate much higher than estimated today.
- (e) The commenters indicate that decommissioning is a "first of a kind" technology and cite a Rand Corporation study which considers such technologies to be subject to large unanticipated cost overruns, as much as 400 percent.
- (f) The cost of decommissioning a reactor will likely equal the cost of construction of the plant.
- (g) The decontamination of Dresden 1 cost about \$40 million for the decontamination activities alone, while the cost of cleanup at TMI-2 will be about \$1 billion. In addition, commenters claim that experience with decommissioning test reactors and similar facilities has shown the need for repeated cleanups and higher costs. Thus, commenters dispute the PNL decommissioning cost estimates as being too low.
- (h) The PNL reports have received no formal criticism or review from individuals outside the nuclear industry and the NRC. In addition PNL has nuclear industry ties.

#### Comment Analysis and Response

NRC, as part of its efforts on rulemaking for decommissioning, contracted with Battelle Pacific Northwest Labs (PNL) to develop an analysis of estimated costs of decommissioning various nuclear facilities, (Refs. 2-15) including PWRs and BWRs, on a generic basis, based on an engineering evaluation of activities involved in decommissioning. As indicated above, certain of the commenters disputed the accuracy of the PNL studies to varying degrees.

The PNL reports on decommissioning a reference PWR and reference BWR are detailed engineering studies of the conceptual decommissioning of a large PWR (the 1175 MWe Trojan Nuclear Plant is used as the reference plant) and a large BWR (the 1150 MWe WNP-2 plant is used as reference). The PNL reports consider: (1) the detailed plant design and layout of the reference plant; (2) estimated conditions in the plant at the time of shutdown (just prior to decommissioning) including estimates of radionuclide inventory and radiation dose rates; (3) techniques for decontamination and dismantling which are current and proven; and (4) radiation protection requirements for workers and the public. Based on these conditions, the PNL reports present detailed work plans and time schedules to accomplish decommissioning, including those for planning and preparation, decontamination, and component disassembly and transport. In making cost estimates of decommissioning, the PNL reports include work scheduling estimates, staffing requirements, specialty contractors, essential systems, radioactive materials disposal, supplies, etc.

The PNL reactor decommissioning studies were performed during the period 1976-1979 and PNL has since prepared updates of the original PWR and BWR studies (NUREG/CR-0130 (Ref. 2) and NUREG/CR-0672 (Ref. 3), respectively) in which the earlier estimates were adjusted for inflation due to increases in labor costs, waste disposal charges, and other general cost increases since the original studies. In addition to inflation, several aspects not considered in the original studies were examined: the use of a general decommissioning contractor in place of the utility acting as its own contractor; the use of an external engineering firm to develop the detailed plans and procedures for accomplishing decommissioning; and the addition of sufficient staff to assure that radiation doses to decommissioning workers do not exceed 5 Rem per year.

Based on the above factors and adjustments, PNL estimates of decommissioning in January 1986 dollars are in the range of \$105 - \$135 million. A breakdown of these costs is contained in the Final Generic Environmental Impact Statement on Decommissioning Nuclear Facilities (Ref. 20). The PNL costs do not include the cost of demolition and removal of noncontaminated structures, storage and shipment of spent fuel, or restoration of the site.

Although it may be difficult to make simple comparisons between different cost estimates for different plants because of site-specific considerations it can be said that the PNL estimates represent a reasonable approximation of the range of decommissioning costs, in particular because they use engineering assumptions and are based on decommissioning experiences. Other estimates made independently from PNL and made using engineering assumptions are in the same general cost range as PNL. Estimates in the range of \$600 million to \$3 billion appear to be unreasonably high. The \$600 million figure is for decommissioning Humboldt Bay and is in year 2015 dollars and hence includes the assumed effects of price escalation between 1984 and 2015 which could be substantial. No specific bases or data are presented by the commenter to justify the \$3 billion figure. It may be based on comparisons of construction and decommissioning costs. However, this is not necessarily a valid comparison as discussed below.

Explanation of differences between the PNL cost estimate range and that cited by the nuclear industry of \$126 to \$176 million rests partly with site specific differences and partly with differing assumptions regarding labor necessary to complete certain decommissioning tasks and differing assumptions regarding waste disposal volumes and charges. These different assumptions come about based partially on the uncertainty inherent in making these cost estimates at this time. Further analysis in revisions to the estimates to account for recent technical information obtained since the original PNL studies were prepared may well reduce the differences in the assumptions and estimates. For example, the NRC has research programs underway to obtain data from the decommissioning of the Shippingport reactor. The rule amendments provide for these differences by allowing the use of site-specific cost estimates in financial assurance provisions.

The commenters in (b) above questioned the PNL data base because it used small reactors as a basis. As discussed below, the primary use of information from earlier decommissionings of small reactors like Elk River was to

gain a perspective on the types of operations necessary and the types of tooling appropriate to accomplish dismantlement.

The fact that the activation levels experienced in Elk River were lower than those anticipated in a reactor after a full lifetime of operation has little effect on the PNL analyses, because components that are highly activated are generally disassembled under water. With water shielding, still higher activation levels will not influence the approach and methods of disassembly and packaging in any significant way.

With respect to the lack of data on contamination and activation levels throughout the plants at the end of life, the activation levels were calculated using well-proven methods and the contamination levels were based on data from actual operating plants after 3 to 6 years of operation. These values are not unreasonable estimates of end-of-life conditions because current operating practice is to perform system and surface decontaminations periodically as required to keep occupational radiation doses to operations personnel within reasonable bounds.

The quotation from the PNL report to the effect that "extrapolations of these experiences to large commercial reactors are considered to be unreasonable" needs to consider the remainder of the discussion contained in the PNL report for the proper context. The statement in the PNL report was not intended to imply that reasonable analyses could not be made for the large reactors. The statement was intended instead to discourage persons from performing linear extrapolations of the Elk River decommissioning costs to a large power reactor by using the ratio of their power levels. In fact, the PNL studies go on to state in Section 4.3 of NUREG/CR-0672 that "the primary value of past decommissioning experience is in identification of the methods and technologies of decommissioning." In Section 4.3.3, NUREG/CR-0672 describes some of the lessons learned from past decommissionings, including the fact that "Past decommissionings have demonstrated some of the aspects of the practicality and acceptability of the various decommissioning approaches. The necessary technology not only exists, but has been safely and successfully applied numerous times to a wide variety of nuclear installations." As can be seen in Appendix G of NUREG/CR-0672, information on techniques and methods from earlier decommissionings, gathered from various sources, is used in considering which techniques are applicable to larger facilities. Some examples are decontamination, physical cleaning, removal of structural material, and equipment disassembly. Thus, as discussed in NUREG/CR-0672, direct extrapolation or comparison of decommissioning the small facilities is not used by PNL in evaluating costs of decommissioning for the larger reference facilities, but rather the usefulness of the earlier decommissionings is in their demonstration of available and successful decommissioning methods and techniques to accomplish specific tasks.

PNL utilizes this information, where applicable to large reactors, and also considers the design and plant layout of the large reactors, and the estimated conditions in the reactor at the time of shutdown, including estimates of radionuclide inventory and radiation dose rates, as well as decontamination techniques and radiation protection measures more appropriate for large reactors. Based on these considerations, the PNL studies developed detailed work plans and time schedules to accomplish decommissioning which

are described in more detail in Sections 4.2 and 9 and Appendices F and G of NUREG/CR-0130 and Sections 3 and 9 and Appendices G, H, and I of NUREG/CR-0672.

The commenters in (c) questioned the PNL estimates due to the costs of the Shippingport decommissioning. In response, first it should be noted that the Shippingport reactor has all of the components of a large commercial reactor, and, in addition, the ratio of the physical size of components at Shippingport compared to the physical size of components at a large commercial reactor is much larger than the ratio of power levels. Thus, the kinds and numbers of operations required to accomplish dismantlement are very similar. The cost of assembling and paying a crew for the decommissioning is high and makes up a large fraction of the cost of decommissioning. Even for smaller facilities, a crew must still be assembled and must perform a number of tasks similar to those in large reactors such as decontamination of piping loops, decontamination of concrete surfaces, vessel and pipe cutting, etc. The costs of staff labor for these activities is significant in each case.

Second, the specific situation at Shippingport must be considered. In particular, the Shippingport dismantlement is being conducted as a learning exercise and an information/technology transfer opportunity for the nuclear industry. More time and effort are being devoted to planning, executing, and documenting each task than would otherwise be necessary during a commercial reactor decommissioning project. Thus, the costs should be greater than expected for a plant of that size. In addition, the Shippingport cost estimate is escalated to real dollars spent during the active decommissioning period up to 1990 which is a reasonable estimation method because DOE needs to project actual year dollar costs for budget purposes. However, this is different from the method used in the PNL estimates which was to use constant 1984 dollars in the proposed rule. To make a valid comparison, both estimates would have to be in the same year dollars. Inflation over this period may also be an important factor. Another factor in the difference in cost is that the Shippingport estimates include cost of demolition of certain facility structures and site restoration, which are not included in the PNL estimates. In addition to these factors, DOE indicated the existence of certain unique items in the Shippingport decommissioning including: the testing of certain decommissioning methods to determine if they fit particular applications; efforts involved to share technology with utilities; and efforts involved in considering the presence of the nearby operating Beaver Valley plants during decommissioning.

The commenters in (d) questioned the cost estimates due to earlier underestimates of nuclear plant construction costs and of cleanup costs at TMI-2. In response, while there is no doubt that decommissioning costs will continue to escalate in step with general price increases, it does not follow that because reactor construction costs exceeded original estimates, decommissioning cost estimates will also be greatly exceeded. Cost overruns in the construction of nuclear plants reflected the regulatory requirements necessary to license a reactor for construction and operation, the cost of interest to borrow money during protracted delays, and other site-specific problems rather than a basic inability to project the technological costs. Decommissioning cost estimates do not include a number of the factors

involved in obtaining an operating license and should not necessarily be subject to such increases. The cleanup at TMI-2 is a first of a kind endeavor with potential for increased costs. The initial cost estimates were based on very limited knowledge of the actual conditions to be overcome and in addition, there were delays in the program caused by technical and regulatory problems. The cost estimate for cleanup at TMI-2 has not increased appreciably since 1981 due in part to a better understanding of the work scope. The cleanup following an accident is not comparable to a normal decommissioning in terms of either technology or cost, and the conditions for a reactor decommissioning can be much more sharply defined than could the conditions for TMI-2 cleanup. Also, the activities needed to decommission are not first-of-a-kind, but reflect direct applications of developed techniques and equipment. Thus, cost increases of the magnitude experienced by the TMI-2 cleanup effort are unlikely to occur for a normal decommissioning effort.

The commenters in (e) questioned the accuracy of decommissioning estimates since decommissioning is a "first of a kind" technology. However, it is not an accurate statement that decommissioning of large power reactors represents first-of-a-kind efforts and is likely to incur unanticipated large cost overruns. As discussed above, decommissioning employs known methods and technologies and should not experience significant cost overruns for technical reasons. As noted in the PNL reports, decommissioning activities have been carried out at a large number of facilities and are currently being conducted at Shippingport. Activities similar to decommissioning have been carried out at operating reactors including a large number of primary system decontaminations.

The commenters in (f) indicated that the cost of decommissioning would likely equal the cost of construction of the plant, i.e., with costs of construction running at \$3 billion, the cost of decommissioning would be \$3 billion. First, there have been no detailed analyses presented to indicate that decommissioning costs will equal construction costs and, in fact, there is not a specifically defined or fixed relationship between these two costs. The PNL studies on decommissioning (NUREG/CR-0672 and NUREG/CR-0130) have not identified a specific relationship between construction costs and decommissioning costs. As can be seen in Section 10 of NUREG/CR-0672, decommissioning costs depend on various specific factors such as costs of staff labor to accomplish decommissioning tasks, costs of disposal of waste, special tools and equipment, miscellaneous supplies, etc. Cost of construction includes several items which have little or no effect on decommissioning costs such as licensing, extensive quality assurance procedures during construction, site preparations, installation and testing of instrumentation, control and electrical systems, the cost of interest on the money used during construction, etc. This discussion does not attempt to define or provide costs of these and other items, but to point out the differing nature of many of the construction costs versus decommissioning cost items, and, why there was no identification of a defined relationship between them in the Battelle-PNL reports.

Secondly, in any comparison of costs it is necessary to place the costs in the same year's dollars in order to have a meaningful basis for comparison. Certainly in about 30-40 years when the reactors are decommissioned, inflation may well drive the decommissioning costs towards the current

cost of construction. However, the NRC decommissioning rule amendments, which will require maintenance of funds in methods which keep pace with inflation and which requires periodic adjustment of funds to account for effects of inflation, will provide assurance that funds are available to pay for decommissioning when needed.

The commenters in (g) disputed the costs of decommissioning due to the high cost of decontamination at Dresden Unit No. 1. However the Dresden facility is a very atypical situation. The Dresden 1 project was a research and development study for the purpose of demonstrating the feasibility of decontaminating plant systems to reduce occupational exposure prior to a plant resuming further operations. When returning a plant to field service, great care has to be taken to ensure that the decontamination solutions and procedures used do not adversely affect the plant's systems. Therefore the procedure used at Dresden was relatively costly since it was highly controlled as a research project. Conversely, decontamination solely for the purpose of reducing the worker dose prior to the initiation of decommissioning would not require the same level of system protection since the systems would never be intended for further use. The system at Dresden consisted of a much larger, more complex set of systems than the portable systems employed today for primary system decontaminations by several nuclear service companies. The costs of a single primary system decontamination are estimated by the service companies to be in the range of \$1 to \$3 million, depending upon site-specific circumstances. The system decontamination described in NUREG/CR-0130, including waste treatment but excluding waste disposal, was estimated to cost about \$484,000 in 1978 dollars. When escalated to 1984 dollars, that cost becomes \$1.07 million, in reasonable agreement with prices quoted by nuclear service companies.

Finally in (h) some commenters indicate there has been no formal review of the PNL reports and that PNL has nuclear industry ties. The PNL studies have been available in the open literature for several years. A variety of other studies employing engineering assumptions and analyses have been conducted since that time with results in a range similar to those in the PNL studies considering the impact of site specific factors. Although a DOE laboratory, PNL's primary function is to perform independent technical studies.

## 2. Comment Summary

Three commenters expressed concern that underestimates of decommissioning costs could cause rate shocks years from now when the true costs of decommissioning would become known, that it could cause delays in or redefining of decommissioning by utilities who haven't accumulated sufficient funds, and that it could also cause negative environmental and health effects. (9, 18, 86)

### Comment Analysis and Response

The costs of decommissioning are based on the best engineering judgement available at this time. The accuracy of this information is discussed in detail in Section D.1.1. As indicated in that section, these estimates are considered to represent a reasonable representation of the range of

the cost to decommission in today's dollars and are not gross underestimates of the true cost.

In addition, there are provisions incorporated in the amendments for adjustment of financial assurance provisions, including the provision that, 5 years before the projected end of operations, licensees submit preliminary decommissioning plans containing a cost estimate for decommissioning based on current conditions and, if necessary, plans for adjusting levels of funds provided for decommissioning. These provisions are intended to take into account the decommissioning alternative anticipated to be used, major technical actions necessary to carry out decommissioning safely, the current situation with regard to disposal of waste, residual radioactivity criteria in effect, and other site specific factors which could affect decommissioning costs. With these requirements there is reasonable assurance that a licensee's provisions should result in a level of funds close to the true cost of decommissioning at the time of termination of operations. Based on this, we do not expect that there will be rate shocks, delays or redefining of decommissioning or negative environmental health effects if licensees follow the provisions of the rule amendments.

A consideration which is equally important as rate shocks years from now is the problem of collecting too much money from early ratepayers if the higher estimates of, for example, \$3 billion suggested by Commenter 9 proves to be a serious overestimate. If this should be the case, which appears likely based on our engineering studies to date, these ratepayers will have been unfairly overcharged when it becomes clear that too much money has been accumulated.

### 3. Comment Summary

One commenter indicated that the extra revenue requirements associated with unrecovered fuel costs should be added to the total costs of decommissioning. One commenter indicated that salvage value of certain components in the facility should be deducted from decommissioning estimates. Also credit should be taken for useful fuel remaining in the core at shutdown which could be used in another facility and thus deducted from the cost. (9,22)

### Comment Analysis and Response

The definition of decommissioning in the amendments (see for example 10 CFR 50.2) indicates that decommissioning includes those activities associated with removing a facility safely from service and reducing residual radioactivity to a level permitting release of the property for unrestricted use and termination of license. Activities related to fuel remaining at the facility are not considered part of decommissioning since they are similar to operational activities and the associated costs are not considered part of decommissioning costs. Salvage value of components are considered to be too uncertain and too small to be considered in the estimated cost of decommissioning.

### 4. Comment Summary

One commenter indicated that the 25% contingency factor proposed in the regulations is unnecessary, is excessive and has been disallowed in a rate

case. The commenter indicated that as additional experience is accumulated actual decommissioning costs will be reduced below the level anticipated. (29)

#### Comment Analysis and Response

The prescribed amounts in the rule amendments include a 25% contingency factor. In addition, the reports on decommissioning technology, safety, and cost prepared by Battelle Pacific Northwest Laboratory (PNL) for NRC include a 25% contingency factor in the estimate of decommissioning cost. The inclusion of this factor in prescribed amounts provided for early in plant life seems reasonable based on the fact that the estimate is being made for an activity that will occur approximately 30 years in the future and there are uncertainties involved, in particular waste disposal. In the cost estimate submitted in the preliminary decommissioning plan five years prior to the end of operations and in the cost estimate submitted as part of the decommissioning plan at the time of termination of operations, when more information about the decommissioning is known and actual planning is being done, the contingency factor necessary could be considered for the particular situation.

#### D.1.2 Costs of test reactor decommissioning

##### Comment Summary

One commenter stated that many non-power reactor facilities are licensed pursuant to Parts 30 and 50 while a few are licensed pursuant to Parts 30, 40, 50, and 70 and that the cost of total decommissioning will be less than the costs of decommissioning piecemeal. Thus the rule should allow licensees to adjust cost estimates accordingly. (21)

##### Comment Analysis and Response

It is not the intent of the rule that costs be overestimated for a particular facility. In the funding plan submitted by a licensee, costs for a particular facility should be carefully estimated to provide a reasonable estimate based on the actual decommissioning situation. If a facility has diverse parts licensed under different sections of 10 CFR, the cost may be estimated to reflect this. Regulatory guidance will provide additional detail in this area.

#### D.1.3 Costs of post-accident cleanup and decommissioning

##### Comment Summary

One commenter disputed the estimates for post-accident dismantlement made by Battelle Pacific Northwest Laboratory (PNL) in a study for the NRC. The commenter's source indicates that a cost of \$3 billion is a more likely figure for post accident decommissioning. Another commenter expressed concern regarding paying the costs of accident cleanup (9, 140)

## Comment Analysis and Response

There is no specific requirement concerning a post-accident cost for decommissioning in the rule amendments. If a licensee were to experience an accident, financial assurance provisions that funds will be available to decommission the facility based on the changed condition of the plant would likely need to be altered. Battelle Pacific Northwest Laboratory (PNL) has prepared a report on the technology, safety and costs of decommissioning reactors following postulated accidents, NUREG/CR-2601 (Ref. 7). In that report they analyze a number of accident scenarios and estimate the cost of the post-accident cleanup as well as the decommissioning which would occur following that cleanup. The costs of the cleanup would be covered by the insurance requirements of 10 CFR 50.54(w). Following accident cleanup, a facility may either be recovered for reuse or be decommissioned. If the facility is decommissioned, NUREG/CR-2601 estimates that the costs of decommissioning following the accident cleanup do not vary significantly from that following normal operations.

### D.2 Use of certification and funding plans

#### D.2.1 Use of certification of a specified amount and funding plans for power reactors

##### Comment Summary

The proposed rule contained provisions that a utility applicant or licensee may submit a certification that financial assurance for decommissioning will be provided in a prescribed amount stipulated in the regulations as \$100 million (1984 dollars). The proposed rule also indicated that this value is to be adjusted annually for inflation using an inflation rate twice that indicated by the change in the Consumer Price Index. The following were comments received on this issue.

- (a) A number of commenters objected to the use of certification or the inflation factor for the general reasons listed below. (1, 9, 14, 22, 23, 26, 29, 31, 38, 47, 51, 56, 61, 62, 72, 75, 77, 78, 80, 87, 88, 91, 92, 95, 97, 99, 100, 101, 102, 104, 105, 107, 108, 111, 118, 123, 126, 127, 131, 132, 133, 134, 138, 139, 140, 141, 142, 143)
- (1) The use of site specific estimates is preferable to a prescribed amount because they will be more realistic and accurate and able to account for site-specific factors.
  - (2) Commenters generally felt that, because of the wide range of site-specific cost estimates, any one value would not be accurate and not be representative of most plants and therefore the number of licensees using certification would be low. Most commenters argued that \$100 million was too low while a few argued that it was too high.
  - (3) The use of a prescribed amount will not decrease utility efforts because they will still have to prepare site specific cost studies for the rate regulators regardless of the certification procedure. Commenters noted that the use of the \$100 million figure or other

similar prescribed amount will be viewed by state and Federal rate regulators as a limiting value, thus placing a burden on utilities to justify to the rate regulators an alternative funding level even if site specific studies show the prescribed amount to be inappropriate for that plant. Some commenters noted that this situation had already occurred in specific situations.

- (4) The use of a specific prescribed amount as stated in the certification was seen by some commenters as setting a revenue requirement which is a function for state and Federal rate regulators.
  - (5) A utility corporate officer will not certify or guarantee a certain rate of recovery over the life of the plant since he cannot certify to the future actions of rate regulators.
  - (6) The inflation factor contained in the proposed rule was considered to be inaccurate because of the different elements involved in the decommissioning cost estimate. There is no historical or other basis for the escalator used, and there is no basis to expect the decommissioning cost to increase at twice the CPI in the future. In particular, commenters noted that future increase in waste disposal costs, which have been the cause of major increases in the decommissioning cost estimate to date, are uncertain and hence difficult to tie to a predetermined escalator. The use of such a factor may cause problems as noted in (3) above; if it were too high could cause an unfair burden, and could create built-in obsolescence for the rule.
- (b) Some commenters indicated that if certification is retained that it should be revised and clarified. The suggestions listed below were made as to what should be done if certification is kept. (23, 26, 29, 30, 31, 61, 62, 66, 67, 73, 75, 87, 88, 91, 97, 99, 100, 102, 103, 105, 107, 108, 111, 123, 126, 127, 128, 129, 133, 138, 139, 141)
- (1) The certification requirement should be clarified to indicate that it is not intended to and does not represent the actual cost of decommissioning, that it is not fixed but is for reference purposes only, that it is only intended to insure minimum financial responsibility and that it is not intended to bind regulatory ratemaking bodies to that figure either as a minimum or maximum.
  - (2) The amount should be increased so that it is sufficiently high to include realistic decommissioning costs, although one commenter indicated the amount was satisfactory.
  - (3) Indicate that, despite the allowance of certification, use of a site specific study is preferable and should be used if available. Only allow use of certification in certain cases when it can be shown that costs are less than \$100 million.

- (4) There should be consideration given to including means to adjust the certification numbers to account for such things as plant size, design, other site specific factors, BWR vs PWR, pre- or post-TMI units, decommissioning alternative, two-unit site savings, etc.
  - (5) Clarification should be included as to what the \$100 million includes, namely whether it covers both radioactive and nonradioactive structures, whether it includes contingencies, whether it is per unit.
  - (6) A more explicit definition of "certification" and criteria which must be met under a "certification" should be included.
  - (7) The use of the inflation factor should be clarified, in particular that it is not intended to reflect the actual rate of increase of decommissioning costs, and the inflation factor should be modified using other escalators, for example a combination of use of Handy-Whitman indexes for labor and materials and published tariff sheets and burial rates for waste disposal. Other commenters suggested various other escalators including the Gross National Product, Implicit Price Deflator, Chase Econometrics, and Consumer Price Index (without any multiplier) while others suggested use of periodic review and update. One commenter indicated that if decommissioning costs are found to differ significantly in the future from that approximated by the prescribed amount then action can be taken to modify the regulation.
- (c) With regard to funding plans, several commenters indicated that there needed to be more specific or quantitative description of NRC's criteria for approval of power reactor funding plans with some indicating it could be in regulatory guides and some not expressing an opinion. One commenter indicated that it is not clear that the proposed rules are intended to provide for the necessary supervision and regulation of proposed utility decommissioning estimates and that some matters would not be subject to review at all. Lack of criteria could result in confusion and potential miscollection of funds. Commenters indicated that better criteria were needed for funding methods and cost estimates. (18, 30, 49, 60, 62, 73, 103, 128, 141)

#### Comment Analysis and Response

As discussed in the Supplementary Information to the proposed rule, the intent of the use of certification is to minimize the administrative effort of licensees and the Commission while still providing reasonable assurance that funds will be available to carry out decommissioning in a manner which protects public health and safety. The certification amount was based on the significant data base on decommissioning developed as part of the policy evaluation. The intent expressed in the proposed rule remains valid, however it appears from the comments that the intent and proposed use of certification has been misunderstood. Thus, the retention of certification requires clarification and adjustment for it to be useful

in the manner it was intended. These points are discussed in the following paragraphs.

First, it is still expected that a proper certification method would provide clear criteria and would minimize the amount of administrative effort that the NRC and licensees must expend in establishing reasonable financial assurance for decommissioning. The certification would also minimize NRC involvement in the rate regulatory process which is an area outside of NRC's jurisdiction. The fact that site specific cost estimates may still have to be prepared for rate regulators is outside the scope of this rulemaking.

Second, the comments that a site specific cost estimate is preferable as noted in (a)(1) above, that the prescribed amount in the certification is not representative of most plants as noted in (a)(2) above, and that the use of the prescribed amount will be viewed as a limiting upper value by rate regulators as noted in (a)(3) above, indicates the certification method in the proposed rule has been misunderstood. The proposed rule stated that a utility could submit a certification that financial assurance for decommissioning will be provided in an amount at least equal to \$100,000,000. (Emphasis added). Accordingly, the proposed rule did not intend to prevent site specific cost estimates from being done and amounts greater than the prescribed amount being estimated and used for financial assurance planning as long as the estimate exceeded the prescribed amount. Under the provisions of the proposed rule, licensees could prepare a site specific cost estimate and if it exceeded the prescribed amount, which would be acting as a threshold review level, the estimate would not be a matter for NRC consideration. The amount listed as the prescribed amount does not represent the actual cost of decommissioning for specific reactors but rather is a reference level established to assure that licensees demonstrate adequate financial responsibility that the bulk of the funds necessary for a safe decommissioning are being considered and planned for early in facility life, thus providing adequate assurance at that time that the facility would not become a risk to public health and safety when it is decommissioned. It is not intended to bind ratemaking bodies to that specific figure. The text of the final rule states that, if a site specific cost evaluation is prepared, it can form the basis for the certification and the licensee may indicate that provisions are being made for an amount greater than the prescribed amount.

Use of the certification approach is a first step in providing reasonable assurance of funds for decommissioning from the Commission's perspective. The second step is that the amendments require the licensee, five years prior to the expected end of operations, to submit a cost estimate for decommissioning based on an up-to-date assessment of the actions necessary for decommissioning and plans for adjusted levels of funds assured for decommissioning. As noted in the Supplementary information to the proposed rule, this estimate would be based on a then current assessment of major factors that could affect decommissioning costs and would include relevant, up-to-date information. These factors could include site specific factors as well as then current information on such issues as disposal of waste, residual radioactivity criteria, etc., and would present a realistic appraisal of the decommissioning of the specific reactor, taking into

account actual factors and details specific to the reactor and the time period.

Combination of these steps, first establishing a general level of adequate financial responsibility for decommissioning early in life, followed by periodic adjustment, and then evaluation of specific provisions close to the time of decommissioning, will provide reasonable assurance that the Commission's objective is met, namely that at the time of permanent end of operations sufficient funds are available to decommission the facility in a manner which protects public health and safety. More detailed consideration by NRC early in life beyond the certification is not considered necessary because of the steps discussed above. In addition, because public utility commissions are to set a utility's rates such that all reasonable costs of serving the public may be recovered and because NRC requirements concerning termination of a license are part of the reasonable cost of having operated a reactor, it is reasonable to assume that added costs beyond those in the prescribed amount could be obtained if the latter were too low as suggested by the commenters.

Based on the above discussion, the level of review contained in this decommissioning rule provides reasonable assurance for funding. In response to those commenters who were concerned that the criteria for evaluation of power reactor funding plans were not sufficiently specific or quantitative, the certification process provides clear requirements and will achieve the objective of reasonable assurance of funding while minimizing associated administrative effort. Therefore, the amendments do not contain requirements for a cost estimate early in reactor life. The more detailed review 5 years prior to end of life is consistent with the requirements for nonreactor facilities who are required to submit updated plans at the time of license renewal (which occurs every five years).

As discussed above, the intent of the amendments is that there be reasonable assurance of funds for decommissioning. Other issues normally outside NRC's jurisdiction such as rate of collection and whether a funding method is equitable should be considered by utilities and their ratemaking bodies. For example, to be more equitable to rate payers, the utilities and ratemaking bodies may want to consider whether amounts should be collected based on a site-specific cost estimate which exceeds the prescribed amount rather than the stepwise approach discussed above. The final rule contains text recognizing that funding for decommissioning of electric utilities is also subject to the regulation of agencies having jurisdiction over rates, and that the NRC requirements are in addition to and not substitution for, other requirements, and are not intended to be used, by themselves, by other agencies to establish rates. Hence, NRC will not become involved in the rate regulation process as it relates to decommissioning.

Based on these considerations, the certification requirement has been retained. However, it has been modified in several ways to incorporate public comments to clarify its purpose and use. First, as noted above, the text of the rule has been revised to indicate clearly that a licensee may use a site specific decommissioning cost estimate to indicate that provisions are being made for an amount greater than the prescribed amount and to delineate the correct usage of the certification. Second, as indicated in Section 50.75(c), the amount has been increased. The revised

amount is based on recent evaluations done for NRC by its contractor Battelle Pacific Northwest Laboratory. As discussed in Section D.1, these estimates are considered to represent a reasonable engineering estimate of the range of decommissioning costs. In preparation of the final rule, the original PNL estimates were reevaluated and compared with other estimates and updated estimates were developed based on recent information. Third, in response to the public comments, the rule text has been revised to clarify what would be covered by the prescribed amount and provisions have been included in the rule to adjust the amount for such factors as plant size and reactor type. The adjustment for plant size is based on PNL's generic evaluation of the effect of plant size on decommissioning cost and overall reviews of a number of plant cost estimates. An indication of the bases for the prescribed amounts and for the adjustment is contained in addenda to NUREG/CR-0130 and NUREG/CR-0672. The final rule text also indicates that amounts are based on activities related to the definition of "decommission" in 10 CFR 50.2 and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the NRC license. Costs of disposal of nonradioactive hazardous waste not necessary for NRC license termination are not included in the prescribed amounts.

In addition, in response to a number of comments, the escalation factor contained in the proposed rule has been revised to better account for factors affecting increases in decommissioning cost. The factors for labor, energy, and waste burial are indicated separately and are based on the addenda to NUREG/CR-0130 and NUREG/CR-0672 and on NUREG-1307 (Ref. 30).

#### D.2.2 Use of certification for R&T reactors

##### Comment Summary

One commenter stated that appropriate levels of assurance should be specified in the rule for research and test reactors so that organizations will have the option of providing assurance in that amount or in some other amount based on a decommissioning funding plan, i.e. the same option afforded most other licensees. (34)

##### Comment Analysis and Response

The use of a certification prescribed amount was not included in the proposed rule for research and test reactors. The Supplementary Information to the proposed rule indicated that for research and testing facilities a specific amount is not set due to the large diversity of facility types. As discussed in NUREG/CR-1756, Addendum, (Ref. 4) prepared by Battelle Pacific Northwest Laboratory for NRC, it is difficult to establish the effect of plant type in costs of decommissioning with any reasonable degree of confidence. Hence, the proposed rule has not been modified in this regard. Other efforts have been made in the rulemaking to minimize the burden on these licensees including use of a statement of intent by federal, state, or local licensees of availability of funds. In addition, the proposed rule has been modified to permit use of financial tests in certain circumstances as was done for materials facilities.

### D.2.3 Use of certification for small power reactors

#### Comment Summary

One commenter indicated that the use of a prescribed amount for decommissioning is inappropriate specifically because it does not take into account the much lower decommissioning costs which would be incurred by a small power reactor. The commenter indicates that a small power reactor should be permitted to accumulate a lesser amount and specifically requests that the proposed rule be modified to allow small power reactors of under 100 MW to provide a fund in the amount of \$20 million in 1985 dollars. (130)

#### Comment Analysis and Response

As discussed in Section D.2.1, use of the certification approach is intended to minimize licensee and NRC administrative effort in providing reasonable assurance that funds are available for decommissioning. As noted in that section the amended rule contains provisions for funding amounts which can vary depending on reactor size. Based on information from Battelle PNL the amounts in the rule are considered reasonable for the reactor sizes indicated in the rule. For very small power reactors an exemption to the certification could be considered in a manner similar to the exemptions taken from 10 CFR 50.54(w) on property damage insurance.

### D.3 Funding methods

#### D.3.1 Flexibility of rule

#### Comment Summary

Several commenters indicated that the rule should provide flexibility and continue to allow a range of options for the acceptable funding methods so that the decision as to specifically which method to use can be made on a case by case basis. (25, 38, 65, 87, 102, 104, 106, 108, 111, 132)

#### Comment Analysis and Response

As the Supplementary Information to the proposed rule indicates, the NRC is allowing some latitude in the use of funding methods. The basis for this latitude is the two criteria discussed in the Supplementary Information. The first and most important criterion from the Commission's standpoint is reasonable assurance that funds will be available in a timely manner for a safe decommissioning. Based on this criterion, certain funding methods are deemed acceptable in the proposed rule for providing reasonable assurance of funds. Latitude for choosing among these methods is permitted by the amendments to take into account other issues which are normally outside NRC's jurisdiction including rate collection, rate-payer cost, taxation effects, whether a method is equitable to ratepayers, and other local concerns.

## D.3.2 Funding method acceptability

### D.3.2.1 Use of internal reserve as a funding method

#### D.3.2.1.1 Principal reasons presented for agreeing or disagreeing with internal reserve as an acceptable funding method.

##### Comment Summary

The proposed rule lists internal reserve as one of the funding methods considered acceptable in providing assurance of funds for decommissioning. In internal reserve, funds are placed into an account or reserve which is not segregated from licensee assets and is within the licensee's administrative control. A number of commenters either disagreed with or favored the inclusion of internal reserve as an acceptable method.

- (a) A number of commenters disagreed with inclusion of internal reserve for the general reasons listed below. (5, 6, 8, 9, 10, 12, 14, 15, 16, 18, 27, 29, 33, 36, 37, 41, 42, 44, 45, 46, 47, 48, 49, 51, 54, 55, 56, 58, 59, 71, 72, 78, 79, 80, 81, 82, 86, 92, 93, 94, 95, 103, 120, 121, 128, 129)
- (1) There may be problems with liquidity of the internal reserve if the acquired assets and investments do not preserve value over time and there may be problems in issuing bonds against these assets to pay for decommissioning. In particular, funds could be used for new nuclear construction or other uses such as accident cleanup. With this method one cannot insure that money taken from customers will be available in the future for decommissioning. This could cause serious cash flow problems at the time of decommissioning, especially if utilities are replacing old plants with new ones at the same time decommissioning takes place.
  - (2) The future financial viability of utilities cannot be assured and the potential exists for utility instability and insolvency. The commenters expressed concern that the utilities could not raise funds for decommissioning if they were having severe financial problems or were facing insolvency resulting in possible health and safety problems or the need to re-fund the decommissioning. Commenters cited examples of potential situations.
  - (3) The level of assurance provided is inadequate and the generation of insufficient funds could compromise safety, cause delays, and cause rate boosts. Nuclear power should pay its way fairly. In addition by not requiring external funds NRC has not responded to the petition for rulemaking made by the Public Interest Research Group in 1977 or to GAO's concern that decommissioning costs be paid by current beneficiaries, not future generations. One commenter indicated that internal reserve costs exceed external reserve costs when they are adjusted to equalize relative risk with respect to the availability of funds.

- (b) A number of commenters agreed with the inclusion of internal reserve as an acceptable funding method for the general reasons listed below. (4, 26, 30, 31, 38, 61, 63, 87, 88, 100, 101, 104, 106, 108, 109, 111, 113, 114, 118, 123, 126, 127, 131, 132, 134, 140)
- (1) The use of internal reserve would enhance utilities' financial positions by reducing external financing needs. In addition, utilities have investments, cash flow, and annual earnings which are large compared to decommissioning costs.
  - (2) The likelihood of instability and insolvency is remote and utilities are good investments and have large assets. Commenters noted that utilities whose rates are regulated are essentially guaranteed a minimum return on investment and have an obligation under the ratemaking system to pay for decommissioning. Commenters also noted that in times of financial difficulty, an internal reserve is sufficient because even utilities with severe financial problems have assets which are large compared to the cost of decommissioning, and it is unlikely that electric generation service would not be provided. Even in the case of insolvency there will be a successor to the insolvent utility who would retain the obligation to decommission. One commenter (38) indicated that the state public utility commissions were in the best situation to judge the solvency of a utility and to evaluate warning signals of a potential problem.
  - (3) Several commenters supported internal reserve because it can earn a higher rate of return, reduces revenue requirements, and provides a reasonable balance between cost and assurance. Also, some commenters noted that there are financial risks associated with external reserve.

#### Comment Analysis and Response

In developing the Proposed Rule, the Commission considered the question of the use of internal reserve in several documents. These include NUREG-0584, "Assuring the Availability of Funds for Decommissioning Nuclear Facilities," (Ref. 25) NUREG/CR-1481, "Financing Strategies for Nuclear Power Plant Decommissioning," (Ref. 26) and NUREG/CR-3899, "Utility Financial Stability and the Availability of Funds for Decommissioning" (Ref. 27). In addition, the Commission held a meeting soliciting public and industry views on decommissioning on September 19, 1984, and the NRC staff reviewed comments in the area of financial assurance submitted on NUREG-0586 "Draft Generic Environmental Impact Statement on Decommissioning Nuclear Facilities." These reports and meetings considered several factors regarding availability of funds for public utilities in the United States. One factor is that utilities are economically large, very heavily capitalized enterprises whose rates are comprehensively regulated by the State Public Utility Commissions (PUC) and the Federal Energy Regulatory Commission (FERC). This factor permits utilities to charge reasonable rates subject to reasonable regulation and rules. In addition, the NRC has taken action in the promulgation of 10 CFR 50.54(w) to set requirements to establish onsite property damage insurance for use after an accident. Although

these insurance proceeds would not be used directly for decommissioning, they would reduce the risk of a utility being hit by a large demand for funds after an accident. Most utilities are now carrying insurance well in excess of \$1 billion. Other factors considered are the long time period before decommissioning takes place during which time reasonable assurance of funds for decommissioning must be maintained, as well as concerns regarding utility solvency and potential problems regarding availability of funds which may occur as a result of bankruptcy.

Before publication of the proposed rule, the NRC evaluated the adequacy of various funding methods in light of financial problems encountered by some utilities which, faced with lower growth in electricity demand than they projected and rapidly increasing costs of construction, had been forced to cancel nuclear plants in advanced stages of construction and the ramifications these conditions, as well as issues related to bankruptcy, could have on a utility's ultimate ability to pay for decommissioning. Details of this evaluation are contained in NUREG/CR-3899, prepared by an NRC consultant, Dr. J. Siegel of The Wharton School, University of Pennsylvania.

Based on the results of NUREG/CR-3899 in which it is indicated that internal reserve can be a valid funding method and on the considerations discussed in the Supplementary Information to the Proposed Rule, the proposed decommissioning rule permitted a range of options, including internal reserve, for providing assurance that sufficient funds are available for decommissioning. However the Supplementary Information to the proposed rule noted that the regulatory approach for assuring funds for decommissioning had been particularly difficult to resolve and specifically requested additional information and comments in this area. In particular the Supplementary Information noted that:

"More specifically, Commissioners Asselstine and Bernthal continue to be concerned about the vulnerability of the internal funding mechanism for decommissioning funds, particularly where the funds are used to purchase assets or reduce existing debt."

Based on this concern, Commissioners Asselstine and Bernthal requested "public comments on the need to consider the possibility of insolvency and its impact on the continued availability of decommissioning funds."

Although commenters did not generally refer specifically to the separate request for comment by Commissioners Asselstine and Bernthal, a number of comments, noted above, were received in this area. Those who disagreed with the inclusion of internal reserve in the rule cited problems with liquidity of the internal reserve and with the future financial viability of utilities, with resultant problems in providing decommissioning funds. and stated that the level of assurance is inadequate. In contrast, other commenters agreed with the use of internal reserve citing the fact that the likelihood of instability and insolvency is remote, that utilities have investments, cash flow, and annual earnings which are large in comparison to decommissioning cost, and that the internal reserve does provide reasonable assurance.

As part of the review of the comments, NRC has had NUREG/CR-3899 updated to consider the current situation in the utility industry. This analysis is contained in NUREG/CR-3899, Supplement 1 (Ref. 27), which reviewed six utilities which have been subject to severe financial distress. Based on

the analysis, NUREG/CR-3899, Suppl. 1, indicates that, since NUREG/CR-3899 was published in 1984, the financial health of the nuclear utilities has improved, with the exception of Public Service of New Hampshire (PSNH), and that from a financial standpoint, use of internal reserve currently provides sufficient assurance of funds for decommissioning. The basis for this conclusion is the fact that the likelihood of future crises developing, although not impossible, is extremely remote; that the total market value of the securities of each of the six utilities studied substantially exceeds its decommissioning costs; that it is not necessarily true that bankruptcy of a utility is tantamount to default on decommissioning obligations; and the potential that the costs of decommissioning would be recognized as a prior obligation with regard to creditors.

Despite these conclusions, NUREG/CR-3899, Supp. 1, notes that PSNH has said that, unless it undergoes financial restructuring and gets the rate increase it is seeking, it probably would become the first major utility to seek protection under the Bankruptcy Act in nearly 50 years (subsequent to the preparation of the analysis of NUREG/CR-3899, Supplement 1, PSNH has filed a petition in bankruptcy under Chapter 11 of the U.S. Bankruptcy Code). In addition, Supplement 1 notes that if PSNH's Seabrook plant becomes operational the prospects for PSNH greatly improve although bankruptcy still cannot be precluded as a possibility due to the potential for large rate hikes and resultant defections from its electric system. Hence, Supplement 1 concludes that internal reserve should not be allowed for Seabrook until the financial prospects of the utility are clarified and the viability of the corporation insured.

In addition, NUREG/CR-3899, Supp. 1, noted that it is imperative that, in the case of the sale or other disposition of utility assets, no monies are distributed to any security holders until a fund is established to assure payment for decommissioning. Supplement 1 also recommended changes in Federal and State bankruptcy laws relating to utilities and the inclusion in the prospectus of newly issued securities of an explicit statement of the utility's financial obligations to provide adequate funds for decommissioning. Further, Supplement 1 noted that because of changing economies and financial conditions, the NRC should conduct periodic reviews of the overall financial health of utilities with ongoing and prospective nuclear facilities. If such a review indicates the financial condition of utilities taken as a whole or individually is such that internal reserve does not provide reasonable assurance of funds for decommissioning, then additional rulemaking or other steps should be taken to insure availability of these funds.

The Commission has considered the conclusions in NUREG/CR-3899, Supp. 1, as well as the public comments received on the issue. The Commission's review in this area is confined to its statutory mandate to protect the radiological health and safety of the public and promote the common defense and security which stems principally from the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended. In carrying out its licensing and related regulatory responsibilities under these acts, the NRC has determined that there is a significant radiation hazard associated with nondecommissioned nuclear reactors. The NRC has also determined that the public health and safety can best be protected if its regulations require licensees to use methods which

provide reasonable assurance that, at the time of termination of operations, adequate funds are available so that decommissioning can be carried out in a safe and timely manner and that lack of funds does not result in delays that may cause potential health and safety problems. Although the Atomic Energy Act and the Energy Reorganization Act do not permit the NRC to regulate rates or to supersede the decisions of State or Federal agencies respecting the economics of nuclear power, they do authorize the NRC to take whatever regulatory actions may be necessary to protect the public health and safety, including the promulgation of rules prescribing allowable funding methods for meeting decommissioning costs. (See Pacific Gas & Electric v. State Energy Resources Conservation & Development Commission, 461 U.S. 190, 212-13, 217-19 (1983); see also United Nuclear Corporation v. Cannon, 553 F. Supp. 1220, 1230-32 (D.R.I. 1982) and cases cited therein.)

For the foregoing reasons, the Commission continues to be concerned with the use of an internal reserve. The Commission notes the concerns expressed in NUREG/CR-3899, Supplement 1, regarding bankruptcy of PSNH as well as the changing economic and financial conditions discussed in NUREG/CR-3899, Supplement 1. The Commission also notes that many utilities are engaging in diversified financial activities which involve more financial risk and believes therefore it is increasingly important to provide that decommissioning funds be provided on a more assured basis.

In addition, to the extent that a utility is having severe financial difficulties at the time of decommissioning, it may have difficulty in funding an internal reserve when needed for decommissioning. The Commission recognizes that the market value of the stock of those utilities studied in NUREG/CR-3899 has exceeded decommissioning cost. However, although the law in this area is not fully developed, in the event of bankruptcy there is not reasonable assurance that either unsegregated or segregated internal reserves can be effectively protected from claims of creditors and therefore internal reserves cannot be made legally secure. In addition, because of the nature of the internal reserve, the funds collected are not isolated for use for decommissioning. Instead the utility may use the funds for other unrelated purposes.

For the above reasons, the Commission concludes that the internal reserve does not provide reasonable assurance that funds will be available when needed to pay the costs of decommissioning and hence does not provide reasonable assurance that decommissioning will be carried out in a manner which protects public health and safety. Accordingly, the proposed rule has been modified to eliminate internal reserve as a possible method of providing funds for decommissioning.

In reaching its conclusion regarding use of internal reserve for decommissioning, the Commission believes it is important not to impose inordinate financial burdens on licensees. The modification to the proposed rule is not expected to impose such a burden for several reasons. First, licensees have two years from the effective date of the final rule before they have to submit information regarding financial assurance. Second, the external reserve is a sinking fund accumulated over a period of time. Third, a number of States (accounting for almost 50% of power reactors) already

require external funding methods. Fourth, recent changes in the tax laws allowing current deductions for external reserves may reduce the cost differential between internal reserve and external reserve. Finally, the rule does not require funds accumulated to date in internal reserves to be transferred to external reserves, however those existing funds if left in internal reserves would not be acceptable for use in meeting the requirements of § 50.75(e)(1) and (3).

D.3.2.1.2 Other reasons presented for disagreeing or agreeing with the inclusion of internal reserve as an acceptable method

Comment Summary

Several other comments were received giving reasons for either disagreeing with or agreeing with the inclusion of internal reserve as an acceptable funding method. These comments are summarized in this section.

Three commenters indicated that the primary concern of this rule should be assurance. One stated that other criteria such as cost of funding methods and equity are inappropriate considerations for NRC. The commenter notes that cost is of minor importance anyway because the variation in cost among the funding methods is small. One commenter indicated that use of internal reserve would limit the extent of public input. One commenter felt that internal reserve should not be permitted because when a plant is shut down there is a high probability for dereliction and delinquency on the part of utilities leaving long term care to be added as a national burden, while another commenter is concerned that there may be a large scale closedown of the nuclear industry which would put a large financial burden on the utilities and raised the question of whether it would be possible to ask Congress to provide a federal bailout which could help utilities to stay solvent long enough to complete decommissioning. One commenter discussed the fact that most utilities are currently using internal reserve which the commenter felt showed that the less desirable a funding method in terms of ratepayer fairness and assurance the more likely it is to be used. Also, the commenter indicated that there has been a case where a utility using internal reserve raised its estimates substantially to get greater use of funds. One commenter was concerned that use of internal reserve would result in licensees defaulting on their commitment and taking advantage of the SAFSTOR option, while another commenter stated that the requirement of external reserve during SAFSTOR will have no real effect since licensees will use internal reserve anyway during plant life. Three commenters proposed limiting the use of internal reserve to certain situations, such as where the liability is small in relation to the company, the company has a strong financial position, the relevant state commission has a demonstrated history of preserving the financial strength of all regulated companies within its jurisdiction, where the licensee has shown it is unable to get a government agency to agree to act as trustee of an external fund and there is no external fund otherwise available which generates nontaxable income.

Conversely, two commenters noted that the Supplementary Information discusses the fact that the prepayment method provides the greatest assurance because the entire amount required is deposited at startup. The commenters indicated, however, that one method of internal funding, namely

straight line depreciation, is structured so that the size of the decommissioning reserve is almost always larger than that which would be in the fund if the prepayment method were used. Thus the commenters state that this method provides the highest level of assurance given the same ability to turn the fund into cash. Other commenters presented the following reasons for agreeing with the inclusion of internal reserve as an acceptable funding method: (1) the periodic reviews required by the regulations will provide an even greater level of assurance that the funding methods and amount are adequate; (2) most state PUCs favor this method and have allowed it so that switching now from the internal reserve methods currently in use to external reserve would be disruptive; and (3) no new information opposing internal reserve has been presented to the Commission since the Commission briefing on September 20, 1984, and therefore these objections were already considered by the Commission in developing the proposed rule. One commenter indicated that in the internal reserve method, funds are invested in other assets and ultimately bonds are issued against these assets to pay for decommissioning, making the assurance of availability of funds dependent on the bonding capability of the licensee's assets. Therefore the comment suggests that the rule require licensees maintaining internal reserve to periodically report to the NRC on their bonding capability. This would provide added assurance that funds would be available at the time of decommissioning. (9, 30, 41, 56, 59, 61, 63, 73, 86, 95, 100, 101, 103, 104, 128, 129, 131)

#### Comment Analysis and Response

Based on the evaluation presented in Section D.3.2.1.1, the Commission concluded, for the reasons noted in Section D.3.2.1.1, that internal reserve does not provide reasonable assurance that funds will be available for decommissioning and, accordingly, the proposed rule has been modified to eliminate internal reserve as a possible method of providing funds for decommissioning.

Based on that evaluation, the additional points raised in this section do not alter the decision. However certain items should be noted in response to the questions raised by the commenters.

With regard to the comment which indicated a concern over dereliction by utilities, it appears that the comment has overstated the concern in this area. While the Commission does not believe that internal reserve provides reasonable assurance of funds for decommissioning, licensees do have the responsibility to carry out decommissioning safely under the regulations. Similarly, the issue of a large scale close-down of the nuclear industry is beyond the scope of this rulemaking which is limited to providing reasonable assurance of the availability of funds for decommissioning. Further, the NRC has no plans for seeking legislation establishing Federal guarantees for decommissioning of privately-owned facilities. With regard to the comment which referred to current usage of internal reserve by utilities and its relation to fairness to ratepayers, it is noted that the rulemaking only considers funding methods based primarily on the criteria of assurance. Current funding method usage and fairness of methods and potential unfair increases in estimates are outside the scope of NRC's jurisdiction. Comments which connected funding methods allowed during the

plant operating lifetime to use of SAFSTOR, or funding methods allowable during SAFSTOR, appear to misunderstand what the rule amendments permit. The funding method used during plant operations to assure funds for decommissioning is independent of the decommissioning alternative chosen at the time of termination of operations and is independent of the method of funding used during a SAFSTOR period.

With regard to the comment which preferred use of internal reserve because it can provide higher levels of assurance than even prepayment, the staff disagrees with the analysis of the comment. First, the prepayment method itself can vary according to whether the deposit includes expected inflation in decommissioning cost or relies on interest earnings to increase the initial deposit. If a deposit includes expected inflation, it would always be higher than an internal reserve. Furthermore, a deposit held by a third-party trustee invested in a diversified portfolio of low-risk instruments would provide greater assurance than an internal reserve, which is by definition limited to investment in the licensee's assets. Regarding the comment that no new information opposing internal reserve has been presented to the Commission since the 9/20/84 Commission briefing, it is noted, as discussed above in Section D.3.2.1.1, that even in the issuance of the proposed rule the Commission expressed concern over use of internal reserve. In response to the comments which are concerned that switching to external reserve would be disruptive, the last paragraph of Section D.3.2.1.1 discusses reasons why the modification to the proposed rule is not expected to impose a burden. In particular, the third and the fifth reasons given address the concern of the comment in this section. Finally, comments suggesting periodic evaluations of use of internal reserve do not present sufficient assurance of availability of funds to alter the Commission decision made as discussed in Section D.3.2.1.1.

#### D.3.2.2 Use of other funding methods

##### 1. Comment Summary

In a comment related to D.3.2.1 several commenters discussed the funding methods they preferred over internal reserve. These included principally the use of prepayment of the funds or the use of an external fund coupled with insurance against premature decommissioning. Principal reasons for favoring these methods include the fact that there may be shutdown of a reactor before the date of its expected end of life due to either an accident or problems with reactor aging or obsolescence. Consequently, sufficient funds for decommissioning might not have been collected by a method which accumulates funds over projected reactor life. Conversely, several commenters indicated that it is appropriate to rely on the property damage insurance requirements of 10 CFR 50.54(w) to supplement decommissioning funding methods. They argue that, with the substantial amount of property insurance required, even in the highly improbable event of an accident-related, premature decommissioning, the utility will still have sufficient resources available after the decontamination process to carry out decommissioning. Some of the commenters recognized the possible difficulties in obtaining nonaccident premature decommissioning insurance. One commenter stated that surety bonds or insurance are not viable alternatives for normal decommissioning or premature decommissioning not associated

with an accident. The commenter noted that nuclear property insurance would be available only if an insured event necessitated premature decommissioning and only in the amount necessary to repair the plant for damages caused by the accident. Premature decommissioning due to regulatory mandate would not be covered. The commenter also noted that surety bonds in the amount of \$100 million are not generally available. (6, 9, 12, 13, 14, 15, 17, 18, 27, 36, 37, 39, 42, 44, 48, 49, 51, 52, 54, 56, 57, 58, 61, 68, 71, 78, 79, 80, 82, 86, 88, 92, 95, 100, 102, 103, 104, 113, 132).

#### Comment Analysis and Response

The Commission notes that these comments must be considered within the context of Commission requirements for onsite property damage insurance, the proceeds from which could be used to decontaminate a reactor after an accident. Although these insurance proceeds would not be used directly for decommissioning, they would reduce the risk of a utility being subject to a tremendous demand for funds after an accident. The Commission has implemented its proposed requirement in 10 CFR 50.54(w) for slightly over \$1 billion of insurance. An important consideration in selecting an acceptable method for providing funds for decommissioning is that the method be reasonably cost effective. Prepayment of funds has been recognized by several studies as being significantly more costly than the other methods. In view of the unlikely nature of the events and the potential problems being considered, prepayment generally has a cost too high for the benefit that would be realized. Use of insurance for nonaccident related decommissioning was found in an earlier study performed for the NRC, NUREG/CR-2370 (Ref. 28), to have potentially serious problems of insurability and moral hazard and is not currently available. (Moral hazard is a term used in the insurance industry to indicate a situation of laxity with respect to loss prevention or loss control where those insured have access to risk prevention.) Finally, earlier studies in NUREG-0584 found that surety bonds were not generally available in the amounts necessary for decommissioning power reactors.

In light of the factors considered, including the assurance provided by the various methods, the unlikely nature of the various events and the cost and practicality of providing more absolute assurance by certain methods, the Commission has concluded that the funding methods listed in the rule as modified by the exclusion of internal reserve are adequate.

#### 2. Comment Summary

One commenter indicated that prepayment or external sinking funds should be in accounts that are overseen by some government entity. (80)

#### Comment Analysis and Response

NRC has considered reasonable assurance as its criterion in evaluating funding methods. With regard to oversight of funding methods by government entities, regulatory guidance under consideration in support of the rule amendments will likely advise that, if a licensee uses a prepayment or external sinking fund method, the institution in which the fund is

placed should be an entity whose trust operations are regulated or examined by a federal or state agency. This is considered to provide reasonable assurance of the availability of funds.

3. Comment Summary

One commenter indicated that external funding is preferable because it is the traditional method of providing for pension fund obligations. In pension funding for utilities money is collected through utility rates, is tax deductible, and is invested in external trust accounts. The commenter indicated that coverage for premature decommissioning should be provided through use of the external fund coupled with insurance provided by either the government or the utility industry. The commenter believes that this pension funding provides a role model for decommissioning funding. (46)

Comment Analysis and Response

Since the establishment of the Employment Retirement Income Security Act of 1974 (PL93-406), government insured pensions liabilities must be funded externally. However, the funds collected for decommissioning are not directly insured by any governmental agency. Although both decommissioning, and pension funding are designed to meet a future obligation for which revenues are no longer received, the obligation to fund decommissioning is similar to the obligation to fund safe operation of the nuclear plant. Therefore, the parallel between funding of pensions and decommissioning is limited.

4. Comment Summary

Some commenters had comments on equitableness of funding provisions to the ratepayers. One commenter noted that external reserve is preferable because it assures the regulator that the customers who use the service from the power plant will pay the cost of decommissioning and that it should be during the useful life of the plant. Another commenter noted that prepayment and external funding are the most equitable funding arrangements for ratepayers assuming that cost estimates are accurate and a straight-line amortization schedule is used. Also the commenter's opinion was that prepayment and external funding are more flexible and responsive to change than internal reserve. One commenter indicated that state public utility commissions must allow proper recovery of costs incurred to ensure equity to the utility (9, 46, 91, 100).

Comment Analysis and Response

As discussed in Section D.3.2.1.1, the proposed rule has been modified to eliminate use of internal reserve based on the criteria of providing reasonable assurance that funds will be available at the time of shutdown of the facility for decommissioning in a manner which protects public health and safety. Apart from this criterion, questions on ratepayer equity, amortization schedules, and responsiveness to change are outside of NRC's jurisdiction and outside the scope of this rulemaking.

## 5. Comment Summary

One commenter indicated that although the rule permits internal reserve funding methods, it includes an explicit preference for using external funding. In particular Commissioners Bernthal and Asselstine clearly favor external funding. (102)

### Comment Analysis and Response

As discussed in Section D.3.2.1.1, the Commission, in reviewing the issue of financial assurance in preparation of the final decommissioning rule, concluded that the internal reserve does not provide reasonable assurance of the availability of funds for decommissioning. Accordingly, the proposed rule has been modified to eliminate internal reserve as an acceptable method of providing funds for decommissioning thus making the point raised by this comment moot.

## D.3.2.3 Funding methods for publicly owned power reactors

### Comment Summary

Two commenters indicated that applicants and licensees of publicly owned power reactors should be permitted to use the provisions of proposed Section 40.36(d)(4), specifically that they can certify that the appropriate government entity is guarantor of decommissioning funds. (62, 126)

### Comment Analysis and Response

Considering the larger amounts of funds needed for power reactor decommissioning, a similar provision for State or local government owned power reactor licensees is not included in 10 CFR Part 50.

## D.3.2.4 Funding methods for research and test reactors

### Comment Summary

Two commenters stated that well capitalized, firmly established private organizations operating research and test reactors should be allowed to guarantee compliance with financial assurance requirements by use of the certification process which is permitted for government entities. (21, 34)

### Comment Analysis and Response

Certain government licensees are permitted in the amendments to meet the funding requirements of the rule by submitting a statement of intent that the appropriate government entity will be guarantor of decommissioning funds. Private organizations were not afforded that option in the proposed rule. The different treatment arises because there is reasonable assurance that the appropriate government entity, which has the power of taxation, will provide adequate funding in the future to decommission the facility in a manner which protects public health whereas this is not necessarily the case with private organizations even if they are currently

adequately capitalized. If they have no funds for decommissioning there can be problems with completion of decommissioning. As noted in Section D.7.4.1 use of parent company guarantees backed up by financial tests will be permitted for private organizations operating research and test reactors.

### D.3.3 Specific comments about the mechanics of funding methods

#### D.3.3.1 External funding methods

##### 1. Comment Summary

One commenter indicated that the rule should not limit external funds to a sinking fund methodology but should also permit other methodologies such as an external fund maintained on a constant dollar basis and that the proposed rule should be expanded to allow the maintenance of an external fund utilizing any fiscally responsible funding basis which achieves the stated objective. (32)

##### Comment Analysis and Response

The term external sinking fund has been used in a broad sense to cover any fund set aside in a periodic manner segregated from licensee assets and outside the licensee's administrative control in a manner that the total amount of funds is sufficient to pay for decommissioning at the time termination of operations is expected. The rule does not preclude the use of various approaches including the method discussed by the commenter. The exact approach would be a matter for the rate regulator and utility to determine. The rule has been modified to clarify this.

#### D.3.3.2 Multi-asset utilities

##### Comment Summary

Three commenters raised questions regarding the provision in the proposed rule that internal reserve is only acceptable for only utilities "owning more than one generating facility." One commenter indicated that the rulemaking should distinguish between the ability of diversified utilities and single asset utilities to provide financial assurance. The other two commenters indicated that the diversity in partial ownership and multiple licensee situations makes this phrase ambiguous and that the term "generating" facility should be defined. Also one commenter indicated that it was not explained why this provision would provide assurance from an internal reserve. (88, 104, 123)

##### Comment Analysis and Response

As discussed in Section D.3.2.1.1, based on a criterion of providing reasonable assurance of the availability of funds for decommissioning, the Commission has modified the proposed rule to eliminate internal reserve as an acceptable method for providing funds for decommissioning. A general standard of acceptable funding methods for all utilities holding power reactor licenses is contained in § 50.75(e) of the amendments.

### D.3.3.3 Internal reserve

#### Comment Summary

Two commenters took issue with the statement in the proposed rulemaking that utilities who use internal reserve would issue bonds against utility assets and use the funds raised to pay for decommissioning. The commenters pointed out that there are various other modes available to pay for the decommissioning from internal funds and that any suggestion that a bond issue is a regulatory requirement should be deleted. Another commenter identified three separate internal funding methods and indicated they can have varying effects on ratepayers. The commenter indicated that since the proposed rule mentions only sinking fund depreciation, it appears that the NRC may be limiting licensees to this one method of internal funding. The commenter recommended that the rule not single out any of the three internal funding methods. One commenter indicated that the NRC requirement that any internal funding option be supplemented by additional guarantee or surety would negate the cost effectiveness of this option and that if a state public utility commission finds that internal reserve is acceptable for reasonably assuring funds for decommissioning, additional surety should not be required. Another commenter expressed concern that unless the NRC modifies its proposed amendments to 10 CFR 50.54(w) along the lines the commenter previously recommended, reliance on the property damage insurance for use with internal reserve may be misplaced. (31, 38, 63, 64, 104)

#### Comment Analysis and Response

As discussed in Section D.3.2.1.1, the proposed rule has been modified to eliminate use of internal reserve as an acceptable funding method thus making the point raised by this comment moot.

### D.3.3.4 Prepayment

#### Comment Summary

One commenter stated that if a licensee uses the prepayment method the accumulated earnings in the decommissioning fund will reach a level larger than required to reflect the annual adjustment for inflation because the proposed rule does not recognize that the accumulated earnings will consist of an inflation adjustment component, a pure interest rate component, and a premium-associated-with-risk component. The commenter recommended that the proposed rule be modified to permit a licensee to withdraw the pure interest rate component and the premium-associated-with-risk component periodically from the prepayment fund. (133).

#### Comment Analysis and Response

The amendments indicate that in prepayment, at the time of decommissioning, the funds are in such amount that the principal plus accumulated earnings would be sufficient to pay decommissioning costs. There is nothing in these requirements which is intended to prevent a licensee from making sure that the fund does not reach a level higher than required. Measures

which licensees may take to prevent that occurrence are outside the scope of this rule. The rule has been modified to clarify this.

#### D.3.3.5 Costs of funding methods

##### Comments Summary

Some commenters indicated that the proposed rule does not go far enough in considering costs of funding methods. One commenter indicated that the proposed rule does not consider the differences in cost of funding methods between public and investor-owned utilities in that the cost of funding methods for the former are lower because of their tax-exempt status. The other commenter indicated that the rule does not require utilities to use the least-cost funding method based on such factors as favorable tax treatment. (30, 62, 104)

##### Comment Analysis and Response

As discussed in Sections D.3.1 and D.3.2, the objective of this rule is that there is reasonable assurance that funds are available when necessary for decommissioning. Issues such as differences in costs between various licensees, taxation effects, and consideration of least-cost funding methods are outside NRC's jurisdiction.

#### D.3.4 Funding requirements during periods of safe storage or long-term surveillance.

##### Summary of Comments

Proposed 50.82(c)(1) would require a licensee planning to delay completion of decommissioning by including a period of safe storage or long-term surveillance to place funds into an external fund or use a surety or certification method. Three commenters misunderstood or requested clarification of part of this requirement with regard to use of certification. Four commenters indicated agreement with the need to require an external fund. One of the commenters indicated that neither a surety or certification should be allowed. Other commenters disagreed with the proposal indicating that utilities should not be required to shift to external funding. One commenter who prefers external funding both during the reactor operating life and the SAFSTOR period, questioned whether the NRC had considered the problems that a utility may encounter in switching from an internal reserve (which the utility can use during the reactor operating life and which may consist of utility investments in utility assets) to an external reserve and how to handle possible lack of available utility funds at that time. The commenter is concerned that NRC may be too late in beginning to worry about assuring funds for decommissioning if they wait for SAFSTOR to begin and that this will result in shifting burdens from current beneficiaries to future generations. In a related comment two commenters indicated that similar requirements for external funding should also be placed on utilities when DECON is being used in certain situations. (9, 30, 38, 44, 49, 61, 95, 104, 128, 129, 134, 143).

## Comment Analysis and Response

In response, as noted in Section D.3.2.1.1, the proposed rule has been modified to delete internal reserve as an acceptable funding method. Because there is as great or greater need for assurance of funds over the extended timeframe involved with a facility in SAFSTOR when the facility is no longer a revenue producing asset, the proposed requirement in § 50.82(c)(1) for external funding during SAFSTOR remains.

With regard to the requests for clarification by the three commenters, as used in proposed section 50.82(c)(1) the term fund certification refers to certification described under proposed Section 50.33(k)(3)(iv) (which in the final rule is Section 50.75(e)(3)(v)) and only applies to those government licensees who are permitted by Section 50.33(k)(3)(iv) (which in the final rule is Section 50.75(e)(3)(v)) to use that method. This has been clarified in the final rule.

Use of a specific funding method is not required during DECON due to the short period of time involved and the fact that the decommissioning process is underway. Reasonable assurance of availability of funding for decommissioning does not appear to require use of a prescribed funding method by utilities during the DECON period.

### D.4 Funding plans

#### D.4.1 Timing of funding plan submittals

##### D.4.1.1 Time period for submittal

### Comment Summary

One commenter agreed with the requirement of a two year time period for submittal of funding plans while two commenters indicated that funding activities should be on a shorter time scale than that and two others felt that it was too short. Three commenters felt that the timing of submittal of the funding plan should be tied to the date of issuance of the regulatory guide which is to be prepared rather than issuance of the effective rule. (30, 61, 95, 103, 104, 107, 123, 128).

### Comment Analysis and Response

The two year time period for demonstration of funding assurance was set as a reasonable period for submitting of information on funding provisions without imposing undue administrative burden related to other activities involved in continued plant operations while at the same time providing that plans for assurance of funds will be established well before decommissioning is to take place. It is expected that regulatory guidance will become available for use in preparation of information on funding provisions.

#### D.4.1.2 Effect of funding plan submittal requirements on pending licenses

##### Comment Summary

Four commenters expressed concern that the requirement for funding plan submittals could have an effect on utilities whose applications for operating licenses are still pending when the rule becomes effective. These commenters point out that this effect could result in introduction of substantial new contentions and delay in operating license proceedings and in issuance of operating licenses. The commenters stated that the language of Section 50.33 of the amendments should be modified to clarify that the proposed revisions are meant to apply to applications for operating licenses filed after the effective date of the rule and not to applications currently under review. (61, 75, 87, 126)

##### Comment Analysis and Response

Based on modifications to the proposed rule discussed in D.2.1, it is not expected that the rule amendments will affect pending operating licenses.

#### D.4.2 Clarification of funding plan requirements

##### 1 Comment Summary

One commenter indicated that the rule should make clear that utilities should collect funds towards total decommissioning of the facilities, not just decontamination of the nuclear parts. (123)

##### Comment Analysis And Response

Decommissioning is defined in amended Section 50.2 as those activities necessary to remove a facility safely from service and reduce residual radioactivity to a level permitting unrestricted use and termination of license. NRC's responsibility with respect to funding of decommissioning is limited by that definition. Funding for activities (such as demolition of nonradioactive structures) not necessary for termination of the license is outside the scope of NRC's authority. The proposed rule has been modified to indicate this more clearly.

##### 2. Comment Summary

One commenter indicated that there is no consideration given for alternative actions to be taken if the financial plan is not approved or if a utility is unable to establish a decommissioning fund as required. (10)

##### Comment Analysis and Response

The amendments indicate that an applicant or licensee is to provide information on how assurance will be provided that funds will be available to decommission the facility. If either this information is unacceptable or if the applicant or licensee is unable to establish a decommissioning fund in accordance with the information provided, then either of these situations will be a matter of noncompliance with NRC regulations and appropriate measures taken.

### D.4.3 Funding plan updates

#### Comment Summary

A number of commenters indicated that it was important for the funding plan to be updated over the operating life of the facility because there would be increases in costs over facility life. Some commenters indicated that there should be periodic adjustments of the funding level, and most said there should be a specific frequency indicated in the regulations with most saying frequencies of 5 years and some indicating it should be more frequent. Three commenters noted the updates should be based on more than just inflation, but include technical data as well, while one commenter noted inflation adjustments were adequate. The commenters indicated that the funding levels should be adjusted at the time of the updated cost estimates. One commenter indicated that the rule should clarify the means by which changes and updates in the plan are to be made. One commenter indicated these adjustments should be submitted to NRC for review while another indicated this was unnecessary. (6, 9, 18, 36, 39, 42, 44, 51, 52, 55, 56, 57, 58, 60, 78, 80, 86, 88, 92, 95, 97, 103, 108, 123, 127, 140)

#### Comment Analysis and Response

The Commission agrees with the importance of updating the funding plan over the operating life of the plant. This is recognized in the proposed rule which requires that a funding plan include "means of adjusting cost estimates and associated funding levels over the life of the facility" and which also requires each reactor licensee to submit a preliminary decommissioning plan containing a cost estimate for decommissioning 5 years prior to the projected end of operation.

In order to clarify that the updates should take place over the course of the facility lifetime, the proposed rule has been modified to indicate that a funding plan include means of adjusting cost estimates and associated funding levels periodically over the life of the facility. The frequency for these updates is not included in the rule but would be included in regulatory guidance under consideration. This will provide more flexibility in dealing with different types of licensees and financial considerations. It is expected that regulatory guidance will indicate the frequency of adjustment for the cost estimate and funding levels.

### D.4.4 Requirements of funding plan as a condition of license

#### Summary of Comments

A number of commenters objected to the requirement in the rule that submittals of reactor funding plans be a condition of license. The commenters indicated that by doing so any change in the funding plan could be interpreted as a license amendment. The commenters argued that this was unnecessary since the funding requirements do not have a direct impact on the safe operation of the plant. This could have a negative effect on continued plant operations even though there was no safety concern. Most commenters argued that the requirements would be better promulgated as regulations which would not decrease NRC's enforcement authority. Three commenters noted if the requirement were left in as license condition they

should make clear that changes to a funding plan do not constitute license amendments. (22, 23, 26, 31, 61, 75, 102, 104, 105, 114, 118, 123, 126, 132, 134)

#### Comment Analysis and Response

The Commission has considered these comments in the light of the need to provide reasonable assurance of the availability of funds for decommissioning and, in response, in order to build flexibility into the rule, has modified the proposed rule to make the reactor funding requirements a specific regulatory requirement in § 50.75 instead of a license condition. Adequate enforcement capability is retained since funding provisions will be submitted to NRC and records of the funding provisions are required to be kept and to be available for inspection.

#### D.4.5 Co-owner planning

##### Comment Summary

Four commenters raised concerns regarding development of funding plans in situations where licensees share ownership interests in a nuclear facility. Two commenters noted that if the co-owners are all investor-owned utilities that consistent state regulatory treatment may be an issue while if the co-owners are municipalities, cooperatives and investor-owned utilities that regulatory treatment or absence thereof may be an issue. Hence these commenters suggest that regulatory guidelines indicate that co-owner licensees adopt different funding methods and amounts based on their percent ownership. A third commenter agreed with this approach while another commenter indicated however, that the majority utility should be responsible for developing decommissioning plans. One commenter indicated that if these rules are promulgated that the proposed rules should be substantially amended to provide for appropriate challenges to utility selected decommissioning plans and estimates, in particular to provide for a reasonable procedure for resolving utility disputes regarding decommissioning estimates. The commenter indicates that it is not clear that NRC has considered or devised efficient and fair procedures for handling challenges to utility decommissioning cost estimates and funding plans. (38, 46, 62, 100, 101)

##### Comment Analysis and Response

The staff agrees that multiple plant owners can complicate development of financial assurance provisions. Nevertheless, various regulatory environments, cost recovery philosophies, or other areas of potential disagreement are not insurmountable. Although the staff cannot accept the use of different cost bases or decommissioning modes by multiple owners of the same plant, we see no regulatory barrier to allowing each owner to make its own funding arrangements based on its own regulatory/ratemaking environment for its share of estimated decommissioning costs as long as all owners have agreed to the same decommissioning cost estimate, alternative, and timing. In any case, the licensee is the responsible unit for submitting integrated financial assurance provisions and the actual

mechanics of development of the provisions among multiple owners is outside the scope of the NRC's regulatory jurisdiction (see *Pacific Gas and Electric v. State Energy Resources Conservation and Development Commission*, 461 U.S. 190 (1983)).

The staff agrees in principle with the issues raised by the comment on challenges and it is hoped that funding provisions could be worked out equitably among co-owners, although it is recognized that in certain situations challenges to a lead licensee's estimates may occur which cannot be resolved satisfactorily for all parties. The staff disagrees, however, that additional procedures are necessary for handling challenges to such estimates and plans. If issues of health and safety or antitrust are raised, the Commission's rules of procedure in Part 2 and other parts would apply and should be sufficient.

#### D.4.6 Collection of funds

##### D.4.6.1 Collection of funds for existing licensees

###### Comment Summary

One commenter pointed out that to date utilities have not gathered funds at a rate proportional to the total sum that will eventually be required. Five other commenters addressed the issue of the rate at which funds should be collected by existing licensees. The proposed rule does not contain specific requirements regarding this rate. However the statement of considerations suggests that the fund be built to an acceptable funding level in 5 years or one-third of the remaining license period whichever is greater. One commenter wanted to know if this requirement applied to electric utilities, if it was a condition of approval of the plan and what was considered by NRC as an acceptable or adequate funding level. One commenter indicated that if an internal fund is used that any requirement to catch up on funding should recognize that the amount to be made up may properly take into account a lower level of payments for the first years of facility life. Three commenters expressed concern with inclusion of any requirements of this type indicating that NRC had no authority to regulate rate collection, that it was more appropriate for state PUCs to determine this "make whole" rate of collection, and that there could be taxation problems associated with the stipulated mode of rate collection. (38, 46, 63, 103, 104, 128)

###### Comment Analysis and Response

The NRC staff has considered its jurisdictional responsibilities with respect to assurance of the availability of funds as well as the jurisdictional responsibility of other regulatory bodies involved in decommissioning funding, specifically the State public utility commissions and the Federal Energy Regulatory Commission. Based on those considerations the discussion of "make whole" rate of collection has been deleted from the revised Supplementary Information. Existing licensees who submit financial assurance provisions should indicate how these funds will be accumulated over the remaining years of plant so that there is reasonable assurance of the availability of funds at the time of decommissioning. The

rule amendments require that for an external sinking fund that there be a "periodic" accumulation of the necessary funds. The exact rate will be worked out with the appropriate rate regulatory body but it is expected that it will likely be prorated over the remaining life of the plant.

#### D.4.6.2 Collection of funds with more than one facility at a site

##### Comment Summary

One commenter indicated that multi-unit facilities can have individual operation dates separated by a number of years and in such cases decommissioning would be impractical prior to termination of operation of the last unit at the site. Hence the commenter suggested that the rule be modified to allow for the collection of the total decommissioning cost for all units at one site to be complete with the termination of operation of the last generating unit at the site. (32)

##### Comment Analysis and Response

The staff recognizes that multi-unit facilities can have individual operation dates separated by a number of years and that in such cases decommissioning may be impractical prior to termination of operation of the last unit at the site. The proposed rule recognizes this situation as a basis for the use of SAFSTOR at a site where more than one facility exists. However the purpose of the financial assurance provisions as stated in the Supplementary Information is to have reasonable assurance that at the time of termination of operations of each facility adequate funds are available so that decommissioning can be carried out in a safe and timely manner. Delay in completion of funding beyond the end of termination of operations when a facility is no longer producing revenue raises questions regarding assurance and, accordingly, amended Sections 50.82(c) and (d) indicate that, while planning for delayed dismantlement activities may be less detailed, funds needed to complete decommissioning are to be set aside.

#### D.4.6.3 Shutdown plants

##### Comment Summary

One commenter indicated that the rules should not allow for collection of money in rates for plants no longer operable since this should be the stockholders' duty. (83)

##### Comment Analysis and Response

The amendments require that licensees inform NRC of their arrangements for demonstrating that there is reasonable assurance that funds will be available to cover the costs of decommissioning. The source of these funds, whether collected from ratepayers or stockholders is outside NRC's jurisdiction and is a matter for the state public utility commissions and the utilities to decide.

## D.5 Effect of taxation policies on funding methods

### 1. Comment Summary

Some commenters pointed out that the Deficit Reduction Act of 1984 allows tax deductions for external funds but not for internal reserve although their value to utilities has been diminished by two provisions. Other commenters pointed out that the Deficit Reduction Act does not change the conclusion under the current tax laws that internal reserve costs less than external reserve. Other commenters stated that the tax deductions contained in the Deficit Reduction Act of 1984 should continue to be allowed only for external funds with no investment allowed in holding company assets. One commenter noted that another bill now in Congress would further liberalize the tax treatment of decommissioning funds even when established internally. One commenter suggested that the proposed amendments should specify a NRC policy that funds for decommissioning be subject to favorable tax treatment or else NRC should explicitly state that nothing in the proposed amendments is meant to prevent favorable tax treatment for decommissioning. Another commenter indicated that there is a need to encourage the Secretary of the Treasury to make the Tax Code clearer in particular in regard to the amount of funds, referred to as the "ruling amount" which can be deducted. One commenter indicated that NRC should work with other agencies on appropriate tax treatment of decommissioning funds. (6, 9, 38, 46, 52, 67, 71, 100, 104)

### Comment Analysis and Response

The NRC's statutory concerns extend only to the protection of public health and safety and promotion of common defense and security. The purpose of the amendments is to provide reasonable assurance that funds are available for carrying out decommissioning in a safe manner. Although NRC is somewhat concerned with the relative costs of funding methods, the issue of taxation policy is tangential to assuring the availability of funds. Thus, this rulemaking is neutral on current and proposed tax legislation. There is nothing in the rulemaking which could be interpreted as affecting the tax treatment for any of the funding methods.

## D.6 Funding requirements for materials licenses

### D.6.1 Exemptions

#### Comment Summary

Two commenters indicated that they support the half-life and quantity exemption provisions as relieving the burden that would otherwise be imposed. One commenter however discussed the fact that as the rule now stands licensees using Co-57, of which there are a sizable number of medical licensees, would not be exempt and would have to demonstrate financial assurance or apply for license amendments to reduce their possession of limit for Co-57. The commenter urged NRC to consider the ramifications of increased administrative burden as well as the possibility of unwarranted hardship placed on these licensees. (53, 65, 85)

## Comment Analysis and Response

Since the major impact regarding the use of natural and accelerator-produced radioactive material rests with the States, the appropriate State Agencies should be consulted. General questions on exemptions for medical facilities licensed by NRC are discussed in Section G.6.1 of this NUREG.

### D.6.2 Funding plans

#### 1. Comment Summary

One commenter indicated that it is not clear in the proposed rule whether financial assurance requirements apply to each license, each licensee, or each facility. The commenter requested that the unit requiring demonstration be clarified and recommended that the licensee be specified as the responsible unit. (76)

#### Comment Analysis and Response

The amendments require that each holder of a specific license provide financial assurance for decommissioning thus specifically indicating that the licensee is the responsible party for financial assurance. Section C.11 discusses the fact that consolidated funding plans and decommissioning plans may be submitted where there are multiple material licenses.

#### 2. Comment Summary

One commenter indicated that the cost associated with submittal of funding plans by materials licensees should be avoided for the benefit of the licensee and the NRC. (53)

#### Comment Analysis and Response

As part of the effort involved in preparation of the proposed rules, NRC prepared a Regulatory Analysis which evaluated the benefits and costs associated with the requirements contained in the proposed rules. The Regulatory Analysis indicates that the large majority of NRC licensees are exempted from the specific requirements on demonstrating financial assurances, although they are nevertheless financially responsible for paying for decommissioning as well as carrying out decommissioning. In addition, for many of those remaining licensees who must demonstrate funding assurance, a certification of an amount and funding method as prescribed in the rule would be sufficient. For those remaining licensees who must submit a funding plan, the plan would only be required at the time of license renewal at which time it is much more efficient for the licensee and staff to implement as part of the overall renewal effort. The regulatory analysis evaluated the costs associated with submittal of these funding plans. Based on these costs and on the number of exempted licensees, the regulatory analysis concluded that the moderate increase in overall costs to the NRC and the industry is balanced by the important increase in the effectiveness of decommissioning activities that will assure that impacts on health, safety, and the environment are minor.

As an additional effort to minimize impacts while maintaining reasonable assurance that funds are available for decommissioning, the proposed rule has been modified to permit certain financial tests for licensees. See Section D.6.4.1 for more discussion of this issue.

3. Comment Summary

One commenter indicated that the rule should not require collection of funds over too short a time period since this would provide an unreasonable burden for certain licensees without associated benefit. The commenter indicates that the time period mentioned in the proposed rule is unreasonable and inappropriate and that a more satisfactory collection period is that contained in EPA regulations for hazardous waste facilities. (25)

Comment Analysis and Response

The amendments in 10 CFR Parts 30, 40, 70, and 72 list four acceptable methods for providing assurance of funds for decommissioning. These include the following: prepayment; surety, insurance or other guarantee method; external sinking fund coupled with a surety method or insurance; and a statement of intent that an appropriate government entity will be guarantor of decommissioning funds. None of these methods places a specified time period on licensees during facility operation for collection of funds. The guarantee methods are continued over the life of the facility while the prepayment method is a deposit of funds prior to start of operations which should be sufficient to pay decommissioning costs when operations are discontinued. In addition to these methods, Section D.6.4 discusses the inclusion of financial tests as a method. These methods are considered to provide reasonable assurance of funds and are consistent with previous Commission actions.

D.6.3 Cost estimates

1. Comment Summary

For material licensees, the proposed rule contained provisions that an applicant or licensee may submit a certification that financial assurance for decommissioning will be provided in a prescribed amount stipulated in proposed 10 CFR Parts 30, 40, and 70. The amount is dependent on the quantity of licensed material which the licensee possesses.

Two commenters indicated that the cost amounts prescribed in the regulations for 10 CFR Parts 30, 40, and 70 licensees are too high for the quantities of material listed and that the prescribed cost amounts should be set more realistically or the prescribed radioactivity levels should be increased. One of the two commenters who felt the estimates were too high noted that the multiples of Appendix C quantities prescribed in the rule for some isotopes amount to absolute quantities of less than a curie and the commenter did not think that the decommissioning costs for such a license would amount to the sums prescribed in the proposed rule. The other commenter indicated as an example that the amount of A-241 in unsealed form requiring a decommissioning cost of \$500,000 is 10 millicuries. Four commenters felt that the prescribed amounts appeared to be

too low and specific examples were cited to support their claim. These included the following: cleanup of a U.S. Army building which had burned cost over \$300,000; cleanup of the extensive contamination at a USAEC contractor facility at Weldon Spring cost \$200,000,000; cleanup of four igloos at the Seneca Army Depot by the U.S. Army cost \$300,000 to \$1,000,000; cleanup and storage of contaminated soil by DOE in the vicinity of the W. R. Grace and Stepan Chemical facilities cost \$2-4 million; and cleanup at Shieldalloy where there is 50,000 cubic yards of slag. In addition, one of the commenters pointed out that use of contractors to perform the work could increase costs. (18, 53, 81, 90, 96, 135)

#### Comment Analysis and Response

In response to the commenters who felt the estimates were too high, it is the opinion of the Commission, that data base cited in the Supplementary Information to the proposed rule, that the prescribed amounts are reasonable estimates and that it is not the rule's intent that the indicated costs be used in every situation. The purpose of setting the amounts is to provide an approach which minimizes the burden on the majority of licensees and on the NRC while providing assurance of funds for decommissioning. If, in a particular case, the prescribed cost amounts are too high, the licensee has the option of submitting a funding plan with a facility specific cost estimate.

In response to the commenters who felt the estimates were too low, certain points must be considered in assessing the comments and the examples cited. Some of the examples appear to be cases where there was accidental spread of contamination beyond that normally encountered. The funding assurance provisions of the proposed rule are not intended to address the costs of cleanup resulting from an accident. Provisions for funding of cleanup of accidental releases of radioactive material were noted as being under consideration in a separate rulemaking (Ref. 29).

Another point to consider is that certain facilities contain larger quantities of radioactive material than are specified in the sections of the rule amendments (i.e., Sections 30.35, 40.36, and 70.25) permitting use of a prescribed funding amount. Licensees of these facilities would be required to submit a decommissioning funding plan containing a cost estimate specific to those larger facilities. Under the provisions of the appropriate sections, licensees of these larger facilities would be permitted to initially use a prescribed amount of \$750,000 in their financial assurance planning. However, use of this prescribed amount is only a temporary action which is intended to reduce the administrative effort associated with implementation of the rule amendments and these licensees are required by the indicated section of the rule to eventually submit a funding plan (with the facility decommissioning cost estimate) at the time of application for license renewal.

Finally, in preparation of the final rule, we are considering the adequacy of the prescribed amounts listed in the proposed rule based on current cost information. Battelle Pacific Northwest Laboratory (PNL) analyzed the technology, safety, and costs of decommissioning for a number of

nuclear facilities for the NRC and the results of these analyses are contained in a series of reports listed in the Reference section of the Supplementary Information to the proposed rule and in Section I of this NUREG (Refs. 2-15). The amounts prescribed in the proposed rule are based on these reports. PNL has provided updated values of decommissioning cost estimates to NRC for use in the Generic Environmental Impact Statement (Ref. 20). Appropriate information has been taken from those updates for use in the final rule to account for factors such as inflation. The cost estimates for materials licensees do not specifically include the assumed use of contractor costs because, based on the PNL studies, the prescribed amounts listed in the rule are considered reasonable in providing adequate funds so that a facility does not become a concern to public health and safety. The additional expense associated with requiring all material licensees to set aside in their funding method the added costs of assuming use of a contractor is not justified compared to the small number of licensees expected to have to use contractors.

Based on consideration of these comments, as well as the comments regarding responsibility for decommissioning in Section D.8.2.3, the proposed rule has been modified to indicate that combinations of isotopes are to be considered in determining levels of decommissioning cost.

The estimated cost of decommissioning is based on activities related to the definition of "decommission" in 10 CFR 30.2 (and similar sections in other parts) and does not include the cost of removal and disposal of non-radioactive structures and materials beyond that necessary to terminate the NRC license. Disposal of nonradioactive hazardous waste not necessary for NRC license termination is not covered by these regulations but would be treated by appropriate agencies having responsibility over these wastes.

## 2. Comment Summary

Two commenters stated that the prescribed amounts of financial assurance contained in the proposed rule should be adjusted for inflation. (18, 90)

### Comment Analysis and Response

An inflation adjustment has not been included in the proposed rule for adjusting the certification amounts in proposed 10 CFR Parts 30, 40 and 70. The reason for this was that the amounts specified in those parts was considered sufficient to cover decommissioning costs for most licensees in the listed categories while minimizing administrative effort of the licensees and the Commission of obtaining financial assurance. Inclusion of an inflation factor may not be sufficiently accurate to be useful due to the large variety of material licensees and the potential for additional administrative burden without compensating benefit. It is expected that the specified amounts in the rules could be easily revised without significant expenditure of resources.

## D.6.4 Funding methods

### D.6.4.1 Use of financial tests, guarantees, internal reserve

#### 1. Comment Summary

The proposed rule listed funding methods that 10 CFR Part 30, 40, and 70 applicants and licensees may use and that are considered to provide reasonable assurance of the availability of funds for decommissioning. Five commenters indicated that this list was too restrictive and that financial tests of licensees should be utilized in determining acceptable funding methods for materials licensees. These commenters argued that use of financial tests on a case-by-case basis would improve the degree of financial assurance and eliminate unnecessary cost burdens for many non-utility, non-government entities. As precedents and examples of tests which could be used by NRC, the commenters generally referred to the financial tests contained in 40 CFR Parts 264 and 265 for hazardous waste facilities regulated by EPA. The commenters indicated that these tests could be used alone or combined with licensee guarantees of funds, with self-insurance or with internal reserve as acceptable methods for assuring funds for decommissioning. The commenters argued that use of the financial tests should be permitted because the methods currently listed as acceptable were either too burdensome or not viable. In particular, prepayment was seen as being too costly, external funding of reserves was viewed as using capital ineffectively, insurance was deemed to be unnecessary and costly, and no current competitive market for sureties or insurance exists. A commenter suggested that a licensee should be exempt from any financial bond posting if the company is small and the company has an active program to control spills and is subject to periodic NRC inspections. One commenter indicated that letters of credit provided a cost-effective method for his operations. (25, 28, 53, 65, 124)

#### Comment Analysis and Response

The Commission did not include the financial test as an acceptable funding method for materials facilities in the proposed rule. It was felt that because of the potential for changing licensee financial conditions and the fairly lengthy time period involved before decommissioning would take place that the financial test would not provide sufficient assurance of the availability of funds for decommissioning. Also, additional staff time could be necessary to monitor the financial status of a number of licensees. This position and the funding methods listed in the proposed decommissioning rule were consistent with the funding methods listed in earlier NRC promulgated rules in 10 CFR Part 40, Appendix A, regarding requirements for funding the decontamination and decommissioning of uranium mills and tailings, and in 10 CFR Part 61 regarding funding for closure of low-level-waste burial grounds.

The commenters point out that the Environmental Protection Agency permits the use of financial tests when accompanied by corporate guarantees for its hazardous waste facilities and recommended that the NRC use similar financial tests for meeting financial assurance requirements. The staff recognizes that financial tests may be useful in certain situations and can

minimize impacts on licensees. Hence, the regulation has been modified in the final rule to specifically indicate that licensees may use parent company guarantees with accompanying financial tests to meet the financial assurance requirements of the regulation. The use of the parent company guarantee and financial test is taken from the U.S. Environmental Protection Agency's regulations 40 CFR Parts 264 and 265. Use of the parent company guarantee and financial test provides assurance in that the company will provide an independent commitment beyond that of the licensee to expend funds. This requirement is consistent with the NRC's Policy Guidance Regarding Parent Company and Licensee Guarantees for Uranium Recovery Licensees issued in December 1985. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of the rule.

Other funding methods, including letters of credit, will continue to be acceptable for providing assurance of funding. Use of prepayment or other external trust funds is different in approach from use of a surety bond, insurance or other guarantee method. With prepayment, the licensee is actually using the instrument to pay for decommissioning of the facility, while with the second approach, a financial instrument is used as backup to pay for decommissioning in the event that the licensee is unable to complete these activities. If a surety, insurance, or other guarantee method is used to actually pay for decommissioning, the licensee is still fully responsible for all of its decommissioning requirements.

The funding methods and the exemptions for small materials quantities allowed by the amended regulations are considered to provide reasonable assurance of the availability of funds for decommissioning.

NRC intends to periodically review the overall financial status of licensees to assess the effectiveness of the funding methods permitted in the regulations.

## 2. Comment Summary

One commenter suggested that its current method of decommissioning funding which involves use of a reserve account in the amount of the estimated decommissioning cost which is updated annually should be considered an acceptable funding method under the proviso of "other methods providing comparable assurance." (115)

### Comment Analysis and Response

Use of a reserve account unless it is segregated from the licensee's assets and outside the licensee's administrative control is not permitted by the regulations. As discussed in Section D.3.2.1.1, internal reserve does not provide reasonable assurance of the availability of funds for decommissioning. The modifications to the regulations discussed in D.6.4.1 in response to Comment No. 1 above permit use of financial tests in certain circumstances.

### 3. Comment Summary

One commenter indicated that materials licensee should be permitted to use the option of certifying the availability of funds for decommissioning as is permitted for government licensees. The commenter argues that a "certification" from a large private organization may have more value than that from a government organization especially since federal, state, and local governments cannot commit funds beyond the current fiscal year. (117)

#### Comment Analysis and Response

See the Comment Analysis and Response to D.3.2.4. Although certification is not permitted, financial tests may be used with parent company guarantees. (See D.6.4.1)

### D.6.4.2 Other funding methods providing comparable assurance

#### Comment Summary

As noted above, the list of acceptable funding methods in the proposed rule includes several principal funding methods and also includes "other funding methods which are demonstrated by the applicant or licensee to provide comparable assurance to the (principal) methods listed." Two commenters requested that additional detail be provided on these other methods and the specific criteria for evaluating comparable assurance. In particular one commenter suggested that use of financial tests would provide comparable assurance. (25, 115)

#### Comment Analysis and Response

"Other methods of funding" were permitted in the proposed rule sections 30.35(e), 40.36(d), and 70.25(e) if they were "demonstrated by the applicant or licensee to provide comparable assurance to the (principal) methods listed," and thus were to be capable of providing assurance to the same level as the specific methods listed in those sections. In general, the criteria used are that the funding method is capable of providing funds for decommissioning at any time in the facility life and that the licensee does not control use of the funds as in the case for the listed methods.

Because there could be confusion in the use of "other methods" and because the listed methods (or combinations of those methods) appear to encompass the potential range of funding methods, the "other methods of funding" provision has been deleted. As noted in section D.6.4.1, it is indicated that financial tests may be used in certain circumstances because financial tests can provide comparable assurance to the listed methods. This is discussed in more detail in that section. The proposed rule has been modified to indicate the inclusion of such tests.

## D.7 Funding for Federal licensees

### Comment Summary

Comments were received indicating that the proposed requirements for Federal agencies, specifically proposed sections in Parts 30, 40, 50, 70, and 72, requiring a certification that the appropriate government entity will be guarantor of decommissioning funds, appear inconsistent with Federal statute. One commenter suggested either NRC should spearhead statutory relief or establish a Federal agency funding strategy in order to satisfy the intent of the NRC proposed rule. (126, 135)

### Comment Analysis and Response

The commenter bases its comments on the provisions of the Anti-Deficiency Act, 31 U.S.C. § 1341. The Anti-Deficiency Act prohibits the creation of an obligation or the expenditure of funds in excess of appropriations unless the contract or obligation is authorized by law. The purpose of the Act is to "keep all departments of the Government, in the matter of incurring obligations for expenditures, within the limits and purposes of appropriations annually provided for conducting their lawful functions." 42 Comp. Gen. 272, 275 (1962). The Act applies to transactions among government agencies as well as transactions between the government and the private sector. See 59 Comp. Gen. 386, 389 (1980).

While the Anti-Deficiency Act might prohibit the expenditure of funds for decommissioning in the absence of an appropriation, nothing in the Anti-Deficiency Act prevents a government agency from seeking appropriations for future obligations. Nor is there anything in the Act that bars a government agency from obligating appropriated funds for the purpose of complying with rules imposed by other government agencies at the time those rules require an expenditure of funds. Thus, in practice, use could be made of other funding methods besides the certification option such as external funding.

As discussed in the Supplementary Information to the proposed rule, the purpose of the proposed sections with which the commenter is concerned to permit licensees to obtain a guarantee that a government agency will assume financial responsibility for decommissioning the facility. This would most likely be possible when the licensee is a state or Federal agency or a state-affiliated organization such as a university or hospital. This provision of the proposed rule recognizes that these licensees should be capable of providing funds for decommissioning. The intention of the proposed rule is that these state and Federal licensees should, early in their facilities' lifetime, be aware of the eventual decommissioning of the facility, specifically its cost, and make their funding bodies aware of those eventual costs. The provisions of the rule requiring naming of a guarantor of funds may be subject to misinterpretation. Accordingly, the proposed rule is being modified to indicate that Federal and State licensees should provide a statement of intent that they have an estimate of the cost to decommission their facilities and that they will obtain funds when necessary for decommissioning. This modification should satisfy the need for assurance from these facilities while making complying with the regulations easier within the constraints of agency budgetary policies.

## D.8 General Comments on Financial Assurance

### D.8.1 Need for Funding Requirements

#### Comment Summary

A number of commenters disagreed specifically with the need for the funding provisions contained in the proposed rule for electric utilities. The primary reasons cited by the commenters for the disagreement were the following: Utilities are regulated by state and Federal rate regulators who are bound to set a utility's rates such that reasonable costs of serving the public are recovered; NRC has recently eliminated financial qualifications requirements for reactors and this is a similar situation; most utilities already recover decommissioning costs in rates; utilities recognize that those who benefit from the plant should pay for decommissioning; and that the proposed rule will impose a financial penalty on utilities, and will complicate the existing process. In contrast, a number of other commenters indicated that there was a need for rules in this area because they had several concerns over whether adequate funds will be available for decommissioning. (4, 5, 6, 7, 8, 9, 13, 15, 22, 25, 29, 30, 31, 36, 37, 38, 41, 42, 46, 49, 56, 61, 62, 63, 67, 73, 76, 77, 79, 80, 82, 86, 88, 95, 102, 103, 104, 105, 107, 110, 111, 114, 118, 123, 126, 128, 130, 132)

#### Comment Analysis and Response

The Commission's statutory mandate to protect the radiological health and safety of the public and promote the common defense and security stems principally from the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended. In carrying out its licensing and related regulatory responsibilities under these acts, the NRC has determined that this regulation is needed because there is a significant radiation hazard associated with nondecommissioned nuclear facilities. The NRC has also determined that the public health and safety can best be protected by promulgating a rule requiring reasonable assurance that at the time of termination of operations adequate funds are available so that decommissioning can be carried out in a safe and timely manner and that lack of funds does not result in delays that may cause potential health and safety problems. Although these Acts do not permit the NRC to regulate rates or to interfere with the decisions of State or Federal agencies respecting the economics of nuclear power, they do authorize the NRC to take whatever regulatory actions may be necessary to protect the public health and safety, including the promulgation of rules prescribing allowable funding methods for meeting decommissioning costs. (See Pacific Gas & Electric v. State Energy Resource Conservation & Development Commission, 461 U.S. 190, 212-13, 217-219 (1983); see also United Nuclear Corporation v. Cannon, 553 F. Supp. 1220, 1230-32 (D.R.I. 1982) and cases cited therein). The fact that these regulatory actions may have an economic impact does not mean that they lie outside NRC's jurisdiction.

Based on the previous paragraph, the Commission approved publication of the proposed rule. Commissioner Bernthal included separate comments (discussed in more detail below) stating that there is a difference between

the elimination of financial qualifications requirements for construction and operation and the decommissioning funding requirements, and expressing the specific need for this rule.

Some of the commenters indicated that there is no need for the rule because there is rate regulation by federal and state agencies. The NRC staff recognizes the role which these agencies have in this area. The NRC staff has had contact with staff of the Federal Energy Regulatory Commission and with State agencies. These agencies indicated that they recognize the NRC's role in setting standards with respect to health and safety and, in particular, that they support the rule as it was promulgated with certain modifications as long as it is understood that states may choose among the funding alternatives based on their specific responsibilities for protecting the interests of consumer by developing reasonable rates for providing public utility services. NRC's rule amendments permit a State or Federal rate regulatory agency to choose from among the funding alternatives listed in the final rule and to choose levels of funding based on specific considerations related to their ratemaking responsibilities, as for example cost and equitability for early ratepayers versus later ratepayers. Under the existing statutory scheme the NRC has the authority to base specific funding arrangements on protection of public health and safety whereas the other agencies do not. In addition, FERC and the state PUCs do not have regulatory responsibility over all utilities. Publicly owned or rural electric cooperatives which set their own rates generally do not come under the jurisdiction of FERC or the state PUCs and would not, absent NRC oversight, be subject to review of their decommissioning funding methods.

In response to comments that there should not be funding requirements for decommissioning because financial qualification requirements for construction have been eliminated, it is NRC's view that the elimination of financial qualifications requirements does not eliminate the need for providing reasonable assurance of funds for decommissioning. When the rule on elimination of financial qualifications was proposed, the Commission stated that decommissioning was more properly dealt with in the separate rulemaking then underway. In promulgating the proposed rule on decommissioning, Commissioner Bernthal drew the distinction between decommissioning assurance and the rule on eliminating the financial qualification review at the licensing stage. Factors cited by the commenters, such as the presence of rate regulators or recognition that those who benefit from plants should pay all costs, do not provide reasonable assurance in and of themselves that health and safety will be protected.

Some commenters stated that the proposed rule would impose a financial penalty on utilities and complicate the existing rate regulatory process. The NRC staff does not believe that this will occur. The proposed rule has the narrow focus of protecting public health and safety by having in place basic minimum standards for funding methods which provide reasonable assurance of funding for decommissioning in a safety and timely manner. The methods allowed include a variety of methods currently available to licensees. As noted in Section D.3.2.1.1, the proposed rule has been modified to delete internal reserve as an acceptable funding method, however, this is not expected to add significantly to licensee's burden for the reasons discussed in Section D.3.2.1.1. As noted in Section D.2.1 the certification of funding levels which may be more than but not less

than amounts prescribed in the rule is included as a means for minimizing licensee burden is complying with the amended regulations. The rule, and the NRC's implementation of it, does not deal with financial ratemaking issues such as rate of fund collection, procedures for fund collection, cost to ratepayers, taxation effects, equitability between early and later ratepayers, accounting procedures, ratepayer versus stockholder considerations, responsiveness to change and other local concerns. In addition, the rule does not deal with costs of demolition of non-radioactive structures and equipment or with site restoration after termination of the NRC license. These matters are outside NRC's jurisdiction and are the responsibility of the State PUC's and FERC. As noted above, the amendments permit a state to choose from among the funding alternatives for specific cases which they are considering related to their ratemaking responsibilities within the content of the general standards. As outlined here, considering the distinct roles that the NRC and the ratemaking agencies have, NRC will not become involved in the rate regulation process as it relates to decommissioning.

Based on the above discussion, the Commission believes that the rule is an equitable means of requiring reasonable assurance of funding for decommissioning without imposing an undue burden on licensees.

#### D.8.2 Liability/Responsibility for Funding and Decommissioning

##### 1. Comment Summary

Seven commenters expressed concern that there must be a clear statement with regard to the responsibility for decommissioning and that utilities should not be able to evade liability for funding of decommissioning costs. A commenter indicated that any licensee that fails to fund or carry out its decommissioning activities should lose or have suspended any other license which it holds until it properly carries out its duties. Another commenter indicated that a utility could avoid liability for decommissioning by forming "holding companies" which would protect assets from the liability of a shutdown reactor. The commenter indicated that these holding companies could diversify into new ventures outside the scope of Federal and State regulation, could take funds from the power company, and thus leave the electric utility portion of the company in a financially weak condition. This financially weak utility might find it very difficult to fund decommissioning and therefore become a threat to public health and safety. The commenter indicated that the rule should provide guidelines to address these issues otherwise ratepayers would be stuck with this problem and radiological hazards may exist. If the rule does not address this question then commenters suggested federal legislation to strengthen utility liability, including repeal of the Price-Anderson limit. (6, 9, 16, 17, 18, 49, 52, 71).

##### Comment Analysis and Response

As discussed in Section D.3.2.1.1, based on its review of the issue of financial assurance in preparation of the final rule, the Commission concluded that the internal reserve does not provide reasonable assurance of the availability of funds for decommissioning. Accordingly, the proposed

rule has been modified to eliminate internal reserve as an acceptable method of providing funds for decommissioning. This would alleviate much of the concern expressed in this comment.

The commenters express the concern that there is a possibility that a licensee could form a holding company to separate assets from liabilities. However, the concern of the commenters can be alleviated by appropriate action by the NRC. The NRC could condition the approval of the decommissioning plan by requiring the licensee to include sufficient funds in the establishment of the holding company. In other words, the NRC would not approve the decommissioning plan unless the holding company had sufficient assets to meet its obligations pursuant to the decommissioning plan in addition to its normal obligations. Thus, the licensee could not sequester assets and liabilities in a manner which would defeat the decommissioning plan. The NRC would have sufficient authority under the Atomic Energy Act and its existing regulations that, if a utility were to try to reorganize in order to evade its decommissioning obligations, the Commission would be able to take action to prevent any adverse health and safety impacts.

The commenters also indicated that there must be a clear statement with regard to the responsibility for decommissioning and that there should be potential for suspension of other licenses. The Supplementary Information to the proposed rule states that "The licensee is responsible for completing decommissioning in a manner that protects health and safety." In addition throughout the Supplementary Information and the text of the rule make clear that the licensee must take responsibility for planning for decommissioning by considering levels of radiation exposure, decommissioning alternatives, waste disposal issues, funding, and conducting termination surveys prior to termination of the license and release of the facility for unrestricted use. The amendments indicate that the licensee must provide a reasonable level of assurance that funds are available for decommissioning and, at the time of permanent termination of operations, must submit a decommissioning plan which addresses the choice of decommissioning alternatives, methods to control occupational and public health and safety, the planned final radiation survey, and funding for decommissioning. These provisions make clear that the licensee has the legal responsibility to plan for and accomplish decommissioning of the facility and preparing the property for release for unrestricted use and that this responsibility cannot be evaded. As noted below in Section H.4, compliance with the regulations is the responsibility of the licensee and the Commission holds licensees responsible for its actions. If violations occur, the licensee would be subject to appropriate enforcement action such as corrective actions and payment of civil penalties assessed by the Commission. The combination of the specific requirements in the amended regulations for funding and for carrying out decommissioning safely and the enforcement action which the Commission may take against a licensee in violation of the regulation may make it unnecessary for the carrying out of the actions suggested by the commenter.

## 2. Comment Summary

Some commenters indicated that utility stockholders should be responsible for any decommissioning costs not collected from ratepayers during reactor life and that no funding method which results in costs exceeding those

estimated should be allowed. The commenters indicated that, if necessary, the states should take action to make utility stockholders responsible for decommissioning costs not collected from ratepayers during the operating life of the plant. One commenter raised the question of how much of the financial burden will fall on the taxpayer, the ratepayer, and the investor, respectively. One commenter indicated the government should share in the decommissioning costs since the government has promoted nuclear power. (6, 9, 41, 42, 49, 52, 79)

### Comment Analysis and Response

As stated in D.8.1, the issue addressed by the proposed rule is the assurance of funds for decommissioning and that is the issue considered by NRC. The questions raised by the commenters, such as stockholder versus ratepayer responsibilities and how the burden will be distributed are outside the scope of NRC's jurisdiction.

As discussed above in D.8.1, the responsibility for decommissioning, including the funding of decommissioning costs, belongs to the licensees who own, operate, and derive benefit from their facilities. The government is not responsible for these privately-owned facilities. It is expected that with implementation of the requirements contained in the proposed rule that funds will be available for decommissioning and that the funding levels should be adequate.

### 3. Comment Summary

One commenter expressed the concern that there exists the potential for reducing material licensee's liability for decontamination activities should the NRC approved funding plan be inadequate. Poor judgment in evaluating funding plans and difficulty in forecasting economic conditions may result in having drastically reduced funds available at decommissioning. (90)

### Comment Analysis and Response

Amended 10 CFR Parts 30, 40, and 70 require that each holder of a specific license provide financial assurance for decommissioning thus specifically indicating the licensee is the responsible party for financial assurance. It is expected that the requirements contained in amended 10 CFR Parts 30, 40, and 70 will provide reasonable assurance that funds are available for decommissioning nuclear facilities. Specifically, Section 30.35 (and related sections in other parts) requires submittal of a funding plan containing an estimate of the cost of decommissioning or use of a certification of an amount prescribed in the regulations. The cost estimate contained in the funding plan will be based on site conditions and can use, as a base, information developed by Battelle Pacific Northwest Laboratory (PNL) in a series of reports on technology, safety, and costs of decommissioning nuclear facilities (Refs. 2-15). NRC's review and evaluation of the estimate can use not only the PNL reports but experience gained at other materials facility decommissionings. Section 30.35 also provides that the licensee include provisions in the funding plan for adjusting decommissioning cost estimates and associated funding levels over the

life of the facility to take into account changing economic and technical conditions. Even in the event that these efforts result in a shortfall of funds at decommissioning, a matter which concerns the commenter, the regulations specifically state that it is the licensee's responsibility to fund and carry out decommissioning in a manner which protects public health and safety. Accordingly, the licensee would be under a continuing obligation to fund the means for completing decommissioning.

Based on consideration of this comment, as well as the comments regarding the cost of decommissioning of materials facilities in Section D.6.3.1, the proposed rule has been modified to indicate that combinations of isotopes are to be considered in determining levels of decommissioning cost.

### D.8.3 Relationship of rule to other agencies

#### 1. Comment Summary

Several commenters addressed the issue of the proper roles of NRC and state and federal ratemaking agencies in establishing funding methods. Some commenters indicated that the rule as presented is satisfactory as long as it is clear in allowing other involved state and federal authorities to decide issues related to the ratemaking impact of decommissioning fund accumulation. The commenters also stated that the rule should not go any further in applying more prescriptive requirements or pre-empting State laws and that the specific funding method should not be prescribed by the rule but should be determined by the ratemaking authorities because they are in the best position to determine the most effective and economic method to arrive at the least cost option, taking into account taxation, accounting, financial and other local considerations. One commenter indicated that the rule should explicitly permit state and Federal ratemaking agencies to apply more stringent funding requirements. Commenters indicated that NRC's jurisdictional responsibility and therefore its principal concern should be that decommissioning is carried out in a safe manner and that ratemaking bodies should have responsibility for choosing cost-effective funding methods. One commenter expressed concern that there may be serious jurisdictional problems and disputes with NRC's rule in that NRC is seeking to exercise control over the economic matters related to decommissioning expense. The commenter indicated that the NRC should make it clear what functions of other ratemaking agencies it intends to supplant and how its regulations will fit with existing state and federal regulation of decommissioning costs. One commenter questioned how NRC will implement the rule in the case of a licensee whose rate regulator does not allow the licensee to recover funds in its rates and set up a decommissioning fund. (4, 9, 22, 26, 29, 38, 46, 52, 61, 62, 63, 67, 87, 88, 100, 101, 104, 105, 118, 123, 125, 128, 129, 131, 132, 134, 140, 142)

#### Comment Analysis and Response

In this rulemaking, the Commission has considered the roles of the state Public Utility Commissions (PUCs) and the Federal Energy Regulatory Commission (FERC), as well as the NRC in establishing acceptable methods available to nuclear power reactor licensees for accumulating funds for decommissioning. Each of these agencies has a role in this area. The Federal

Energy Regulatory Commission has the responsibility for setting rates for the transmission and sale (wholesale) of electricity by investor-owned utilities in interstate commerce and authorizes the conditions, rates, and charges for interconnections among electric utilities. The sales of electricity for which FERC would set rates are small, comprising about 13 percent of total U.S. electricity sales. State public utility commissions have the responsibility for setting rates for retail sales of electricity to homeowners and companies doing business in their states. NRC is responsible for protecting the public health and safety during the construction, operation, and decommissioning of nuclear facilities. As part of assuring public health and safety, the NRC has issued a number of rules in the general area of financial criteria: Part 40 Appendix A, Criterion 9 (on assuring that sufficient funds will be available to carry out decommissioning and decontamination of uranium mills and for reclamation of any tailings or waste disposal areas); Section 50.33(f) (on demonstrating to the Commission the financial qualification for certain licensed activities); Section 50.54(w) (on obtaining onsite property damage insurance to assure adequate funds for decontamination after an accident); Part 61, Subpart E, Section 61.62 (on providing assurance that sufficient funds will be available to carry out closure and stabilization of low level waste disposal facilities); and Section 72.18 (on the decommissioning plan and financial arrangements to provide reasonable assurance that decontamination and decommissioning will be carried out for independent spent fuel storage installations).

The NRC's authority to regulate the hazards of nuclear waste and protect the public health and safety is derived from the Atomic Energy Act and the Energy Reorganization Act. These acts do not permit the NRC to regulate rates or interfere with decisions of State or Federal agencies with respect to the economics of nuclear power. However, the NRC is the sole authority with respect to health and safety regulation. The questions raised by the commenters include whether the funding requirements are purely economic or are in some way connected to the protection of the public health and safety.

In general, licensees do experience increased costs because of regulatory requirements imposed by the NRC. For example, an emergency core cooling system is required before a plant is permitted to operate and it is very expensive. This increase in cost certainly can be viewed as a form of ratemaking because a state utility commission must include the costs of the cooling system in the utility's rate base or authorize the utility to recover the costs as an operational expense. However, the requirement for an emergency core cooling system is also a valid exercise of the NRC's regulatory authority to protect the public health and safety. The proposed decommissioning rule is only different in degree and not kind. There is a significant radiation hazard associated with nondecommissioned nuclear facilities. This safety determination is clearly within the scope of the NRC's authority, see Pacific Gas & Electric v. State Energy Resources Conservation & Development Commission, 461 U.S. 190, 212, 217-19 (1983), and none of the commenters takes issue with the NRC's power to make that determination. To protect the public health and safety, the NRC has developed this rule which will provide protection to the public health and safety. The development and implementation of this rule also is within the scope of NRC's authority. See id. at 212-13; see also United Nuclear Corporation v. Cannon, 553 F. Supp. 1220, 1230-32 (D.R.I.

1982) and cases cited therein. Therefore, the difference between the decommissioning rule and the requirement for an emergency core cooling system is the cost associated with the two rules. However, a difference in cost does not transform a valid exercise of regulatory authority into an impermissible intrusion into the ratemaking powers of the states or other federal agencies.

Thus the basis for setting allowable funding methods is that NRC's statutory responsibility to protect the health and safety of the public requires reasonable assurance that at the time of termination of operations adequate funds are available so that decommissioning can be carried out in a safe and timely manner. However, it is also clear that state PUCs and FERC have jurisdiction and responsibility with regard to financial ratemaking issues including such matters as rate of fund collection, procedures for fund collection, cost to ratepayers, taxation effects, equitableness, accounting procedures, ratepayer versus stockholder considerations, responsiveness to change, and other local concerns. NRC's rule amendments do not attempt to interject NRC into those areas. As discussed in D.8.1, NRC's rule amendments permit a State or Federal rate regulatory agency to choose from among the funding alternatives listed in the final rule and to choose levels of funding based on specific considerations related to their ratemaking responsibilities indicated in this paragraph. Under the existing statutory scheme the NRC has the authority to base specific funding arrangements on protection of public health and safety whereas the other agencies do not. The general standards listed in the amendments include funding methods currently under consideration by State and Federal ratemaking agencies.

The rule establishes requirements for indicating to NRC how reasonable assurance will be provided that funds will be available for decommissioning. Specific financial and local issues identified by the commenters will not be addressed by NRC but will be left to state PUCs and FERC to determine. As discussed in Section D.2.1, the final rule contains text recognizing that funding for decommissioning of electric utilities is also subject to the regulation of agencies (e.g., FERC and state PUCs) having jurisdiction over rates, and that the NRC requirements are in addition to, and not substitution for, other requirements, and are not intended to be used, by themselves, by other agencies to establish rates. As discussed in D.8.1, considering the distinct roles that the NRC and the ratemaking agencies have, NRC will not become involved in the rate regulation process as it relates to decommissioning.

## 2. Comment Summary

One commenter indicated that they supported the transfer of the decommissioning responsibility to the federal agency as this would provide maximum assurance for decommissioning. The commenter indicated that funds must be collected in a manner similar to that for the nuclear fuel disposal provision (38).

### Comments Analysis and Response

The rule does not propose that decommissioning responsibility be shifted to the federal agency or that NRC be involved in fund collection. The

Supplementary Information to the proposed rule stated that the licensee is responsible for completing decommissioning in a manner that protects health and safety. The amendments indicate how the licensee can demonstrate to the NRC reasonable assurance that funds will be available to decommission the facility in a safe manner. Licensees have this responsibility and with existing methods can provide reasonable assurance of funding for decommissioning. Responsibility for the carrying out of decommissioning of facilities or for administering decommissioning funds is outside of NRC's jurisdiction.

## E. Residual Radioactivity Limits

### E.1 Need for residual limits

#### 1. Comment Summary

Commenters expressed concerns about the absence of residual radioactivity limits, and urged the NRC to develop such levels as quickly as possible. Reasons given were health and safety concerns, difficulty of decommissioning planning, and commonality of objectives concerning waste burial and decommissioning requiring a de minimus level. Several commenters made specific comments on the numerical value of the residual limit and how it should be chosen. (9, 14, 15, 17, 18, 22, 33, 42, 51, 52, 58, 60, 71, 73, 78, 95, 101, 105, 119, 126, 128, 129, 134)

#### Comment Analysis and Response

The Commission is participating in an EPA organized interagency working group which is developing Federal guidance on acceptable residual radioactivity levels which would permit property to be released for unrestricted use. Proposed Federal guidance is anticipated to be published by EPA. The selection of an acceptable level is outside the scope of this rule-making. Currently, criteria for residual contamination levels do exist and research and test reactors are being decommissioned using present guidance contained in Regulatory Guide 1.86 for surface contamination plus case-by-case considerations for direct radiation. As an example, NRC provided such criteria in letters to Stanford University, dated 3/17/81 and 4/21/82 providing "Radiation criteria for release of the dismantled Standard Research Reactor to unrestricted access." The NRC is currently developing interim guidance with respect to residual contamination criteria.

#### 2. Comment Summary

Commenter feels that survey criteria should be provided in the rule, even on an interim basis and that the final rule include clarification of when information other than a final radiation survey is adequate to allow termination of license. (40)

#### Comment Analysis and Response

Survey criteria should depend on the residual radioactivity level chosen. It is intended that development of such information in a regulatory guide would be more appropriate. Such development in the proposed rule is inappropriate and too detailed. Submission of the decommissioning plan to the NRC for approval, however, does require a detailed description of the survey plan.

## E.2 Need residual limits prior to issuance of this rule

### Comment Summary

Comments expressed concern that this rule should not be issued until the rule on residual radioactivity level is issued because without it one cannot plan or estimate cost and entirely satisfy financial assurance requirements and must assume Regulatory Guide 1.86 values are acceptable. In addition, establishment of a limit could eliminate needless litigation. Commenters also indicated that the value of residual radioactivity limits will impact cost for non-power reactors. (19, 21, 22, 25, 80, 90, 105, 112, 117, 136)

### Comment Analysis and Response

It is imperative that decommissioning regulations in 10 CFR Parts 30, 40, 50, 70, and 72 be issued at this time because it is important to establish financial assurance provisions, as well as the other decommissioning planning provisions of the rule, as soon as possible so that funds will be available to carry out decommissioning in a manner which protects public health and safety.

As noted in Section E.1 criteria for residual contamination levels currently do exist and research and test reactors are currently being decommissioned using present guidance contained in Regulatory Guide 1.86 (Ref. 21) for surface contamination plus case-by-case considerations for direct radiation. As an example, NRC provided such criteria in letters to Stanford University, dated 3/17/81 and 4/21/82 providing "Radiation criteria for release of the dismantled Stanford Research Reactor to unrestricted access." (As discussed in E.1, development of interim guidance to formalize NRC criteria is under consideration.) The cost estimate in a funding plan can be based on current criteria and guidance regarding residual radioactivity levels for unrestricted use. The information in the studies by Battelle Northwest Laboratory (Refs. 2-15) and Oak Ridge National Laboratory (Refs. 16 and 17) on decommissioning have indicated that in any reasonable range of residual radioactivity limits the cost of decommissioning is relatively insensitive to the radioactivity level and use of cost data based on current criteria should provide a reasonable estimate.

Even in situations where the residual radioactivity level might have an effect on decommissioning cost, with the update provision in the rule it is expected that the decommissioning fund available at the end of facility life will approximate closely the actual cost of decommissioning.

Based on the need for the decommissioning rule to supplement provisions currently existing with those contained in the rule amendments, and on the discussion in E.1, the Commission believes that the rule can and should be issued now.

## F. Environmental Review Requirements

### F.1 Environmental Review Requirements and Environmental Impact Statements

#### Comment Summary

A number of commenters were concerned that the proposed rule would not require the preparation of an environmental impact statement (EIS) in connection with each decommissioning of a reactor but would require only an environmental assessment (EA) unless the assessment showed that an EIS should be prepared in a particular case. In contrast, some commenters made specific comments supporting this aspect of the proposed rule. Of the commenters opposed, some thought that this would not allow for public input which they felt was important and several thought that the proposed rule violated the National Environmental Policy Act; the rationale of two of these was that the GEIS was not adequate. One commenter felt that there needed to be more successful experience of decommissioning various types of reactors before it could be decided that an EA was sufficient. Another suggested that an EIS should be prepared for major facilities such as power reactors and fuel fabrication facilities but an EA would be appropriate for smaller facilities. One commenter suggested that there should be an EIS but that reference to the GEIS could be allowed if careful study or testing or both at a given facility showed that the generic approach was adequate. In a related comment, a few commenters stated that the categorical exclusion of funding plan approvals from environmental review requirements was appropriate while one commenter felt it was not. (1, 2, 8, 9, 14, 22, 31, 33, 37, 40, 42, 50, 51, 54, 55, 58, 61, 63, 68, 71, 78, 80, 81, 86, 92, 95, 101, 103, 104, 123, 126, 129, 136)

#### Comment Analysis and Response

A number of commenters who opposed the elimination of the requirement for a site-specific EIS argued that the EIS at licensing could not adequately estimate impacts in detail because much could change in the 30 to 40 years before decommissioning. Although the proposed rule discussed the fact that EIS's at licensing should address the impacts of decommissioning, the analyses of those impacts at that time is not considered to take the place of evaluating environmental impacts at the time of decommissioning. At the time of decommissioning, a large quantity of waste must be handled and disposed of; this waste is essentially a result of having operated. The NRC action to be taken at the time of decommissioning is to approve an appropriate method of handling this waste. Alternative methods of handling this waste will have different impacts which can be systematically assessed. The Commission's primary reason for eliminating a mandatory EIS for decommissioning is that the impacts have been considered generically in a GEIS. The Commission determined that examination of these impacts and their cumulative effect on the environment and their integration into

the waste disposal process could best be examined generically. A final, updated GEIS has been issued (Ref. 20). The GEIS shows that the difference in impacts among the basic alternatives for decommissioning is small and the dose impact of decommissioning is small, whatever alternative is chosen, in comparison with the impact accepted from 40 years of licensed operation. The relative impacts are expected to be similar from plant to plant, so that a site-specific EIS would result in the same conclusions as the GEIS with regard to methods of decommissioning. Although some commenters correctly point out that an EA is much less detailed in its assessment of impacts than an EIS, if the impacts for a particular plant are significantly different from those studied generically because of site-specific considerations, the environmental assessment would discover those and lay the foundation for the preparation of an EIS. If the impacts for a particular plant are not significantly different, a Finding of No Significant Impact would be prepared. In answer to the comment concerning violation of NEPA, the Commission's rules concerning EA's and EIS's comply with case law and Council on Environmental Quality regulations. In response to the concern that decisions on decommissioning will be made without public input, decommissioning involves amendment of the operating license and the NRC rules provide an avenue for public input with respect to license amendment. With regard to categorical exclusion of funding plans, based on discussions in Sections D.2.1 and D.4.4, this area is removed from consideration.

## F.2 Costs included at construction permit stage

### Comment Summary

One commenter indicated that costs of decommissioning should be included in the EIS prepared at the time of construction as well as when the decommissioning plan is submitted. (71)

### Comment Analysis and Response

As discussed in the Supplementary Information to the proposed rule, the overall impacts of decommissioning should be included at the time of licensing. At that time, however, it is only possible to consider major impacts such as waste disposal. A detailed analysis would be impractical, and would have no impact on the decision since decommissioning costs and impacts are small compared to the total cost and impacts of building and operating a major facility such as a reactor.

## F.3 High level waste disposal problems

### Comment Summary

One commenter was concerned about the problems of decommissioning if there is no high level waste repository at the time power reactors are ready for decommissioning and noted particularly that the impacts of this would not have been considered in the EIS's at licensing. (137)

## Comment Analysis and Response

As discussed under F.1, inclusion of decommissioning impacts in the EIS at licensing does not substitute for environmental review at decommissioning. The rule and the GEIS did not assume, as the commenter suggests, that all high level waste will have been removed at the end of operation. Although decommissioning begins following the permanent end of operation, the license will not be terminated until all wastes have been removed from the site. The analysis of the rule and the GEIS has considered the necessity of using a SAFSTOR option if wastes cannot be removed because of lack of disposal capacity. The impacts connected with the storage of spent fuel onsite after the end of operation have been considered in the waste confidence proceedings. Decommissioning plans, environmental reports and assessments, and EIS's if necessary, will address the storage of waste and spent fuel during the decommissioning phase. (More detail on waste disposal issues is contained in section H.1 of this NUREG).

Section 51.53 requires a supplement to the environmental report addressing the storage of spent fuel at a power reactor after the expiration of the operating license. Section 51.95 covers the supplement to the EIS or the environmental assessment for the postoperating license stage.



## G. General Comments

### G.1 General reaction

#### Comment Summary

A number of commenters specifically expressed support for the rule in general (or that no comment was needed), although some of these made suggestions for improvements. One commenter explained how the rulemaking was similar to what they as a state government were requiring in the area of assuring funds for reactors. One commenter indicated that "the proposed amendments will provide a foundation from which acceptable decommissioning planning and implementation programs can be developed." Another commenter stated that "the Commission's assumptions underlying the proposed rule are reasonable and fair." Many specifically commented on the need for rulemaking. For example, one commenter stated that although some states have begun developing regulations, their efforts are hampered by the lack of Federal guidelines; one commenter urged the Commission to quickly promulgate a comprehensive set of regulations governing the planning, safety, and financing of decommissioning. Others implied the need for rulemaking but felt that the proposed rule was inadequate to satisfy its intent and generally recommended stricter, more detailed regulations. A few of these suggested the rule be redrafted and republished for comment and that public meetings be held. The specific concerns have been addressed in other sections according to the particular issues. In contrast, some commenters argued that existing rules were adequate and that this rule was unnecessary, overly prescriptive, and burdensome. For example, one commenter indicated that there is no evidence from experience with power reactors that there would be any adverse impacts in the absence of this rule and that this rule represented an unfair burden to nuclear power facilities compared to other public risks; one commenter pointed out that decommissioning methods are regulated by public utility commissions and that NRC should only step in to ensure safety. Another commenter suggests that the rule is in conflict with the 1985 Policy and Planning Guidance which indicates the Commission's intent to have less prescriptive regulations. Two commenters suggest that these issues could best be handled by regulatory guidance. (1, 4, 5, 7, 8, 9, 10, 11, 13, 15, 16, 18, 22, 25, 29, 30, 31, 33, 36, 37, 38, 40, 41, 42, 45, 46, 47, 49, 51, 52, 55, 56, 58, 61, 62, 65, 66, 67, 68, 69, 72, 73, 78, 79, 80, 81, 82, 86, 88, 90, 91, 92, 95, 102, 103, 104, 105, 107, 110, 111, 118, 123, 125, 126, 128, 129, 132, 137)

#### Comment Analysis and Response

The detailed rationale presented by the comments has been discussed in the other sections of this NUREG. Although modifications have been made as a result of some of the more specific comments, the NRC believes that the rule's approach presents the best available method for assuring that licensees develop plans sufficient to carry out decommissioning in a manner which protects public health and safety and is not inimical to the common

defense and security. In the development of this rulemaking, public meetings have been held. In addition, further opportunities have occurred for the public to become informed and express their views through the notice and comment process prescribed by the Administration Procedure Act. This process produced numerous publicly available documents including the Advanced Notice of Proposed Rulemaking, the Draft GEIS, the Notice of Proposed Rulemaking, and the NUREG and NUREG/CR reports referenced in Section I.

## G.2 Coordination with state agencies

### Comment Summary

Two commenters suggest that there should be consultation with the states in the decommissioning process. One was particularly concerned with possible disagreement between the states and NRC over adequacy of decontamination limits and residual radioactivity levels. (90, 110)

### Comment Analysis and Response

This rule has not addressed such consultation, however, Section 50.91(b) requires licensees to notify the state any time an amendment to license is requested and provides for NRC and state consultation. Because decommissioning involves amendment of the operating license, Section 50.91(b) applies.

## G.3 Applicability of regulation to different licensees

### 1. Comment Summary

Some commenters were concerned that the regulations may have been drafted with power reactors in mind and applied to non-power reactors without adequate realization or consideration of the differences in the level of difficulty in decommissioning between these classes of facilities. They suggested that the rule should distinguish between reactor types and make requirements appropriate for non-power reactors. One commenter pointed out that the costs of decommissioning research reactors are considerably less than those for power reactors and that it might be on the order of one or two years operating budgets. This commenter also pointed out that there was considerable experience in decommissioning research reactors and that there were no real uncertainties and suggested that there may not have been comparable input from the research reactor community as there was from utility organizations in developing the proposed rule. Another commenter indicated that adequate budgets were difficult to obtain, that the "existence of research reactors at universities hangs on a thin thread," and that the burden of additional requirements could cause these threads to be cut. One commenter suggested that the health and safety of the public is better protected if research reactors are operating and effective rather than to have them shut down or made ineffective and that additional rules which result in "nonproductive" work and costs take resources needed for effective research centers. Another commenter was concerned with our lumping together power and non-power reactors as "major facilities" even though research reactors are simpler and less costly to

decommission and suggested that the cost will in many cases be manageable within a licensee's normal financial planning and budget. (19, 21, 25, 35, 70, 117)

#### Comment Analysis and Response

The Commission has not drafted the rule amendments for power reactors and then applied to non-power reactors without taking into consideration the differences. The data base included a contractor study addressing the technology, safety, and costs of decommissioning research and test reactors. The comments concerning lower costs, more experience, fewer hazards, and open-ended operating life are true, however, these factors have been considered. The rule does distinguish between power and non-power reactors in the methods allowed for financial assurance. The methods allowed for non-power reactors are the same as for materials licensees and require commitment or guarantee at startup of the total amount of funds needed for decommissioning, whereas power reactor licensees have the option of building up the fund over facility life. As a means of minimizing the burden, Federal or State government licensees may provide a statement of intent indicating that funds for decommissioning will be obtained when necessary. The burden of providing financial assurance in the case of private non-power reactors is unavoidably greater, but will be in line with the projected costs for the particular reactor.

Power and non-power reactors were lumped together for discussion purposes as major facilities only to the extent that no classes of reactors were considered appropriate for exemption from provisions for financial assurance and decommissioning planning. The comment regarding the existence of research reactors hanging on a thin thread, in fact, supports the conclusion that financial assurance is needed in the case of research reactors. In regard to decommissioning plans, non-power reactors were never exempted from submitting dismantlement plans. The rule sets out the contents of decommissioning plans with no distinction for classes of reactors. However, the level of effort in developing plans and in the amount of material submitted will vary in practice commensurate with the level of effort required for the decommissioning. The Commission has attempted to minimize the burden of complying with these rules to the extent possible.

#### 2. Comment Summary

One commenter was concerned because the preamble to the proposed rule did not discuss the distinctions between Part 50 and Part 72 installations and suggests that the level of effort for decommissioning would be significantly different. The commenter also suggests that this lack of explanation, especially because of the one step licensing process in Part 72, could result in licensing confusion. (126)

#### Comment Analysis and Response

Part 50 and Part 72 facilities were called major facilities and combined for discussion in some parts of the Supplementary Information for the sake of brevity, because both types of facilities would be subject to financial

assurance and decommissioning planning requirements. It is argued that the level of effort for decommissioning is different between the two facilities. However, the requirements for reactors and ISFSI's are clearly spelled out in the text of 10 CFR Parts 50 and 72 and there appears no reason for confusion in the actual licensing process. In addition, a regulatory guide on decommissioning plans for 10 CFR Part 72 facilities is being developed.

#### G.4 Unresolved waste disposal issues

##### Comment Summary

One commenter expressed the opinion that because of unresolved issues on availability and cost of disposal, these items should be excluded from decommissioning plans and financial assurance. Another suggested that the rule should not be made effective until these issues are resolved. (25, 76)

##### Comment Analysis and Response

While there may be uncertainty regarding the cost and disposal of decommissioning waste, such uncertainty is all the more reason to consider this in the decommissioning activities. For example, choosing the SAFSTOR alternative instead of DECON may be reasonable for waste disposal reasons. More detail regarding waste disposal issues is contained in Section H.1.

#### G.5 Inadequate GEIS

##### Comment Summary

Commenters expressed the concerns that the DGEIS is out of date and incomplete in areas of cumulative impacts, waste disposal, accident, and alternative selection. (72, 86, 103)

##### Comment Analysis and Response

An FGEIS will be issued at the time of issuance of the final rule. Major changes in the DGEIS are not expected, but additional elaboration as well as discussion of bases for appropriate rule modifications will provide the necessary basis for final rule promulgation.

#### G.6 Exemptions

##### G.6.1 Rule should exempt medical licensees

##### Comment Summary

One commenter suggested that all 2500 medical licensees be exempt from this regulation on the basis that generally decommissioning for medical licensees can be accomplished without significant time, risk, or expense. They suggest that at least in their case, inclusion would be unwarranted and counterproductive to the goal of health care cost-containment. (20)

## Comment Analysis and Response

The Commission agrees that for the majority of medical licensees decommissioning presents little difficulty because the materials used are almost exclusively short-lived or sealed sources. Under the requirements of amended Parts 30 and 40, very few, if any, medical licensees would be included in either the financial assurance or decommissioning plan requirements. A few medical licensees may need to amend their licenses to avoid unnecessarily being included in financial assurance requirements if their licenses are written more broadly than is necessary for the actual use of materials. An amendment to reduce possession limits may be readily obtained. The one requirement that will apply to medical licensees is the recordkeeping, however the burden will be limited by the limited information which is applicable.

### G.6.2 Exemption from rule for reactors

#### Comment Summary

One commenter was concerned about the possible exemption of a reactor from the rule which could be granted if a utility could prove undue hardship or extreme circumstances, indicating also that this request would allow greater Commission control of the decommissioning process. (72)

#### Comment Analysis and Response

The rule has been written to allow flexibility in meeting the requirements. It is unlikely that any utility could justify an exception to any part of the regulation. However, requests for exemption of a reactor from any requirement would be decided by the Commission in accordance with existing procedures in 10 CFR 50.12 of the Commission's regulations.

### G.7 Waste disposal facilities

#### Comment Summary

Two commenters agreed that the decommissioning of nuclear waste disposal facilities be covered in other rulemaking actions. (40, 137)

#### Comment Analysis and Response

The requirements for waste disposal facilities, including decommissioning, have previously been previously adopted and are incorporated in 10 CFR Parts 60 and 61.

### G.8 Procedural

#### Comment Summary

Four commenters requested that comments submitted after the close of the comment period be considered. (89, 95, 139, 140)

## Comment Analysis and Response

All comments received including those submitted after the close of the comment period have been fully considered and the analysis and response to these comments is included in this document.

### G.9 Clarification of applicability

#### Comment Summary

One commenter was confused because the background to the proposed rule indicated that the rule applied to any NRC license although the commenter had been informed by the Regional Office this was not the intent of the rule, and suggested that a clarification be made. (43)

#### Comment Analysis and Response

The rule applies to all NRC licensees (except waste disposal facilities and uranium mill and mill tailing facilities). The specific application of the rules to a particular licensee can be determined by reading the provisions of the rule. In some instances, the licensees will be required to provide detailed funding and decommissioning plans. In other instances, the requirements needed for compliance are minimal.

### G.10 Compilation of existing information

#### G.10.1 Index of applicable regulations

##### Comment Summary

Two commenters suggest that NRC should prepare an index of existing regulations applicable to decommissioning and also that these should be incorporated by reference into a separate set of rules that specifically govern decommissioning. (86, 103)

##### Comment Analysis and Response

Although such an index might be useful as regulatory guidance, it would not be necessary or appropriate to incorporate such an index by reference into the regulation since the individual requirements are already in the regulations. The possibility of a separate set of rules is discussed under C.1.3.2.

#### G.10.2 Compilation of decommissioning experience

##### Comment Summary

One commenter suggested that the NRC should compile, organize, and evaluate all available information and experience on decommissioning and then develop recommendations and guidelines for the DECON and SAFSTOR methods of decommissioning. (15)

### Comment Analysis and Response

During the development of this rulemaking, the NRC has been involved in compiling, organizing, and evaluating available information and experience on decommissioning. In addition to developing this regulation, several regulatory guides are being developed which could provide recommendations and guidelines for decommissioning methods.

#### G.11 Post-Accident decommissioning

##### Comment Summary

Three commenters endorsed the distinction between decommissioning and accident-related decontamination even though decommissioning may follow accident cleanup. (61, 104, 123)

##### Comment Analysis and Response

The final rule has not changed the separate treatment of these two activities. Further discussion is contained in Section C.1.17.

#### G.12 Decommissioning archives

##### Comment Summary

One commenter noted that documentation of decommissioning should be archived. (90)

##### Comment Analysis and Response

It is recognized that this is an important aspect of decommissioning and it is expected that relevant information will be stored on microfiche. It is not the responsibility of the licensee after license termination and need not be addressed by these amendments.

#### G.13 Offsite liability

##### Comment Summary

One commenter suggested that the licensee's liability for decontamination should include offsite contamination. (90)

##### Comment Analysis and Response

Significant offsite decontamination has not been assumed for decommissioning planning and funding purposes because controls during operation would be expected to keep offsite contamination to a minimum. However, the Commission has the authority to order the licensee to clean up offsite contamination at any time during operation or at the time of decommissioning if necessary.

#### G.14 NRC takeover

##### Comment Summary

Two commenters would like the NRC to take over actual decommissioning responsibility rather than licensee. (11, 38)

##### Comment Analysis and Response

The NRC has no statutory authority to undertake decommissioning. NRC licensees have the responsibility for decommissioning their facilities. It is expected that compliance by licensees with applicable portions of NRC regulations will result in decommissioning of facilities in a manner which protects public health and safety.

#### G.15 Resident inspectors during decommissioning

##### Comment Summary

One commenter requested that NRC inspectors should be assigned to a facility undergoing decommissioning. (15)

##### Comment Analysis and Response

Decommissioning operations are of a routine nature and do not involve as potentially serious a health and safety situation as facility operation. Commensurate with this situation, NRC inspectors will visit facilities being decommissioned as deemed appropriate.

#### G.16 Independent study

##### Comment Summary

Three commenters stated that decommissioning costs should be studied by the Office of Technology Assessment (OTA) because among other things Battelle Pacific Northwest is biased. (9, 17, 54)

##### Comment Analysis and Response

The NRC believes that the studies prepared by Battelle on the technology, safety, and costs of decommissioning (Refs. 2-15) were done in a professional manner and produced quality results. These studies are discussed in more detail in Section D.1. The NRC has no specific objection to another study, however OTA is an arm of Congress and not subject to the jurisdiction of NRC.

#### G.17 Revised Regulatory Guide 1.86 available before rule

##### Comment Summary

One commenter would like to review the revised Regulatory Guide 1.86 before the rule is finalized. (21)

## Comment Analysis and Response

Because procedural aspects concerning decommissioning in the rule can change, it is difficult to issue a draft Regulatory Guide 1.86 before the rule is finalized. However, it is intended that a draft of revised Regulatory Guide 1.86 will be issued for comment as soon as practical.

### G.18 Section 50.33(2) on financial qualifications

#### Comment Summary

One commenter requests that requirements in 50.33 (2) with respect to reactor operational aspects should not be part of rulemaking. (102)

#### Comment Analysis and Response

Proposed modifications to Section 50.33(2) were made only to include the word "decommissioning" in the existing terminology.

### G.19 Basis of costs of rule implementation

#### Comment Summary

One commenter questions the staff evaluation of the costs of implementing the proposed rule contained in the Regulatory Analysis, and notes that proceedings on financial assurance in the State of California by the utilities and the public utility commission have already exceeded staff cumulative estimates. (22)

#### Comment Analysis and Response

The staff's evaluation of costs of implementing the rule amendments represents an estimate of the difference in costs between applications of the rule requirements currently existing and those additionally proposed. While the staff recognizes that there can be many contingency situations, it is possible to deal with these on a case-by-case basis. In regard to financial assurance, it is clear that the NRC always required the cost of decommissioning to be borne by the licensee. Originally, assurance of funds was handled through financial qualification requirements. When these requirements were eliminated for power reactors, the Commission requested that development of the decommissioning rule amendments contain financial assurance requirements.

It was expected that the amendments, by being more explicit in the particulars required, would result in a more direct and implementable situation than had been the general situation in the past. Consequently latitude in the areas of funding estimates and assurance methods was provided for in the rule. Moreover, a draft regulatory guide in this area is intended to provide for additional guidance in licensee development of funding provisions.

## G.20 Incorporation of DGEIS comments

### Comment Summary

One commenter wants to incorporate the comments he made concerning the DGEIS as relevant to the proposed rule. (104)

### Comment Analysis and Response

The rule as well as the FGEIS must be consistent. Accordingly, response to comments in either the FGEIS or final rule should be very similar. Comments on the DGEIS were considered in developing the proposed rule. However, the formal analysis of those comments will appear in the FGEIS and therefore are not repeated in this document.

## G.21 Criteria for spent fuel storage

### Comment Summary

One commenter suggests that there should be criteria for storage of spent fuel. (103)

### Comment Analysis and Response

Storage of spent fuel is currently performed under either a Part 50 or 72 license (independent spent fuel storage). Existing 10 CFR 50.54(bb) requires licensees to submit to the Commission written notification of the program by which the licensee intends to manage and provide funding for the management of all spent fuel at the reactor upon expiration of the reactor operating license until its ultimate disposal. Criteria for such storage is outside the scope of this rulemaking.

## G.22 Definition of "site"

### Comment Summary

One commenter requests that a definition for "site" be given so that release of uncontaminated areas can be more easily allowed. (67)

### Comment Analysis and Response

The NRC license defines the boundary of the site. Anything outside this boundary is unrestricted. To release the site it must be shown to be at an acceptable residual radioactivity level such that the license can be terminated. If a licensee wishes to release portions of the original site, he must obtain a modified license.

## G.23 Reference to Section 50.54(bb)

### Comment Summary

One commenter indicated that NRC should reference the licensee requirements for spent fuel 50.54(bb) in the rule. (140)

### Comment Analysis and Response

The rulemaking consists of amendments to existing rules including amendments to 10 CFR Part 50. Reference to Section 50.54(bb) in the amendments themselves is unnecessary.

#### G.24 DOE taking possession of spent fuel

##### Comment Summary

One commenter indicated that NRC should encourage DOE to take possession of spent fuel as soon as possible so as not to delay decommissioning. (140)

##### Comment Analysis and Response

The disposition of spent fuel is covered by the Nuclear Waste Policy Act of 1982, as amended (NWPA). As discussed in Section H.1.1, disposal of spent fuel is outside the scope of this rulemaking. However, alternative methods of decommissioning are available under the amendments to 10 CFR Part 50, including delay in completion of decommissioning during which time there can be storage of wastes. Delay in decommissioning can result in a reduction of occupational dose and waste volume due to radioactive decay. In addition, provisions are made in the amendments to 10 CFR Part 50 to assure adequate funds for the completion of decommissioning.

#### G.25 Radiation lethal

##### Comment Summary

One commenter stated that the effects of radiation from a nuclear reactor can be lethal. (7)

##### Comment Analysis and Response

Protection of the public health and safety from the effects of radiation is the reason why reactors are regulated. If the reactor activities are handled properly, and in accordance with NRC regulations, then no significant adverse radiation effects should occur.

#### G.26 Sociopolitical problems

##### Comment Summary

One commenter noted an "unfounded concern for sociopolitical problems" in the Regulatory Analysis and indicated that this was not the NRC responsibility under the Atomic Energy Act. (22)

##### Comment Analysis and Response

The impetus for rulemaking by the Commission must always be related specifically to its responsibilities under the Atomic Energy Act such as the health and safety of the public. However, a cost-benefit analysis such as appears in the Regulatory Analysis appropriately considers all types of costs and benefits including sociopolitical ones.



## H. Comments Outside Rule Scope

### H.1 Criteria for waste disposal

#### H.1.1 Consider waste disposal criteria and decommissioning waste classification

##### 1. Comment Summary

Commenters indicated that NRC must carefully study wastes resulting from decommissioning and provide proper classification of these wastes. Decommissioning standards should include clear definitions of high-level (including spent fuel), low-level, and "intermediate level" wastes. Consideration should be given to means of transport and proper disposal for different types of decommissioning wastes so that wastes are not placed into burial grounds for which they are not suited. Also, consideration should be given to availability of disposal capacity for the different classes of decommissioning wastes.

In particular, long lived activation products, such as Ni-59 or Nb-94, should not be classified as low-level waste nor buried at LLW disposal sites. Commenters suggested that long lived wastes and wastes containing intense emitters be classified as high level waste. Also "intermediate level" wastes containing long lived isotopes should not be buried in low-level waste disposal sites. Concern was expressed by the commenters that without availability of disposal capacity there could be problems with carrying out decommissioning, in particular, lack of high-level waste disposal sites could cause problems. (5, 9, 13, 15, 17, 18, 25, 41, 42, 44, 49, 52, 57, 71, 82, 86, 103, 137)

##### Comment Analysis and Response

Criteria for wastes needing to be disposed of at the time of decommissioning are contained in existing regulations and are beyond the scope of this rulemaking action. Disposal of spent fuel will be via geologic repository pursuant to requirements set forth in NRC's regulation 10 CFR Part 60. Disposal of low-level wastes is covered under NRC's regulation 10 CFR Part 61. Because low-level wastes cover a wide range in radionuclide types and activities, 10 CFR Part 61 includes a waste classification system that establishes three classes of waste generally suitable for near-surface disposal: Class A, Class B, and Class C. This classification system provides for successively stricter disposal requirements so that the potential risks from disposal of each class of waste are essentially equivalent to one another. In particular, the classification system limits to safe levels the concentrations of both short- and long-lived radionuclides of concern to low-level waste disposal. The radionuclides considered in the waste classification system of 10 CFR Part 61 include long-lived activation products such as Ni-59 or Nb-94, as well as "intense emitters" such as Co-60.

Wastes exceeding Class C limits are considered to be not generally suitable for near-surface disposal, and those small quantities currently being generated are being safety stored pending development of disposal capacity. The Low-Level Radioactive Waste Policy Amendments Act of 1985 (Pub. L. 99-240, approved January 15, 1986, 99 Stat. 1842) provides that disposal of wastes exceeding Class C concentrations is the responsibility of the Federal government. These wastes may be considered to basically correspond to the "intermediate-waste" designation suggested by commenters.

As far as decommissioning wastes are concerned, technical studies coupled with practical experience from decommissioning of small reactor units indicate that wastes from future decommissionings of large power reactors will have very similar physical and radiological characteristics to those currently being generated from reactor operations. Two of the studies performed by NRC include NUREG/CR-0130, Addendum 3 (Ref. 2), and NUREG/CR-0672, Addendum 2, (Ref. 3) which specifically address classification of wastes from decommissioning large pressurized water reactor (PWR) and large boiling water reactor (BWR) nuclear power stations.

These studies indicate that the classification of low-level decommissioning wastes from power reactors will be roughly as follows:

<u>Waste Class</u>	<u>PWR (Vol. %)</u>	<u>BWR (Vol. %)</u>
A	98.0	97.5
B	1.2	2.0
C	0.1	0.3
Above C	0.7	0.2

As shown, the great majority of the waste volume from decommissioning will be classified as Class A waste. Only a small fraction of the wastes will exceed Class C limits.

Transportation of decommissioning wastes will involve no additional technical considerations beyond those for transportation of existing radioactive material. Existing regulations covering transportation of radioactive material are covered under NRC regulations in 10 CFR Parts 20, 71, and 73 and Department of Transportation regulations in 49 CFR Parts 170-189.

Disposal capacity for Class A, Class B, and Class C wastes currently exists. Development of new disposal capacity under the State compacting process is covered under the Low-Level Radioactive Waste Policy Amendments Act referred to above. This Act provides for incentives for development of such capacity, as well as penalties for failure to develop such capacity. NRC staff expects that Congress will provide guidance for development of disposal capacity for wastes exceeding Class C concentrations. Disposition of spent fuel, which although not included as a decommissioning activity could nevertheless impact on the decommissioning schedule, is covered by the Nuclear Waste Policy Act of 1982, as amended.

Licensees will have to assess the situation with regard to waste disposal as part of the decommissioning plan which they submit according to the requirements of 10 CFR 30.36, 40.42, 50.82, 70.38 and 72.38. In addition,

the rule amendments require that at or about five years prior to the projected end of operation, each reactor licensee submit a preliminary decommissioning plan containing a cost estimate for decommissioning and an up-to-date assessment of the major technical factors that could affect planning for decommissioning. The Supplementary Information of the proposed rule indicated that this requirement would assure that consideration be given to relevant, up-to-date information which could be important to adequate planning and funding for decommissioning well before decommissioning actually begins. These considerations would likely include an assessment of the current waste disposal conditions. If for any reason disposal capacity for decommissioning wastes were unavailable, there are provisions in Section 50.82 to allow delay in completion of decommissioning which would permit temporary safe storage of decommissioning waste. In addition, Section 50.82 contains requirements to ensure that adequate funding is available for completion of delayed decommissioning.

The Supplementary Information to the proposed rule indicated that the DECON decommissioning alternative assumes availability of capacity to dispose of waste. Alternative methods of decommissioning are available including delay in completion of decommissioning during which time there can be storage of wastes. Delay in decommissioning can result in a reduction of occupational dose and waste volume due to radioactive decay.

## 2. Comment Summary

Two commenters stated licensees should be required to show that the wastes they produce will be accepted by appropriate waste disposal sites. (86, 103)

### Comment Analysis and Response

As discussed in H.1.1.1, legislation is in place that addresses the availability of disposal capacity. The legislation is as follows: (1) the Nuclear Waste Policy Act of 1982, as amended, and (2) the Low-Level Radioactive Waste Policy Amendments Acts of 1985. In addition, as also discussed in H.1.1.1, NRC regulations already provide that the licensee ensure that the waste when shipped is properly classified and acceptable for LLW disposal.

Licensees will have to assess the situation with regard to waste disposal as part of the decommissioning plan which they submit according to the requirements of amended 10 CFR 30.36, 40.42, 50.82, 70.38, and 72.38. In addition, amended 50.75 requires that at or about five years prior to the projected end of operation, each reactor licensee submit a preliminary decommissioning plan containing a cost estimate for decommissioning and an up-to-date assessment of the major technical factors that could affect planning for decommissioning. This requirement assures that consideration be given to relevant, up-to-date information which could be important to adequate planning and funding for decommissioning well before decommissioning actually begins. These considerations would likely include an assessment of the then current waste disposal conditions.

The Supplementary Information to the proposed rule indicates that the DECON decommissioning alternative assumes availability of capacity to dispose of waste. However as noted in H.1.1.1 there are provisions in amended Section 50.82 to allow delay in completion of decommissioning which would permit storage of decommissioning wastes. Amended 50.82 also has requirements to assure adequate funding is available to complete decommissioning.

3. Comment Summary

Two commenters suggested that shallow land burial of all radioactive wastes from decommissioning be banned. (5, 18)

Comment Analysis and Response

The low-level waste rule, 10 CFR Part 61, was promulgated in December of 1982 to ensure protection of public health and safety. The rule specifies performance objectives, licensing procedures and minimum technical requirements for suitability; site design; facility operations; site closure; environmental monitoring; waste classification; waste characteristics; waste labeling; land ownership; and institutional controls. The rule covers areas of concern regarding decommissioning wastes.

In addition to the rule, there has also been over 40 years of experience in low-level waste disposal at both government and commercial disposal sites. This experience, plus several studies such as those discussed earlier (Refs. 2-15), indicate that wastes from future decommissioning activities will be very similar to those wastes which are currently being generated by operating facilities.

NRC staff concludes that there is no health and safety basis for requiring different disposal practices for decommissioning wastes than those required for existing wastes of comparable hazard.

4. Comment Summary

Concern was expressed by some commenters that it was unlikely that a high-level waste disposal site would be available in the near future, some mentioning 2010 or later. Without this availability there will be problems with carrying out decommissioning. (9, 42, 59, 80)

Comment Analysis and Response

The "Nuclear Waste Policy Act of 1982," as amended, outlines the schedule for development of a geologic repository and monitored retrievable storage for high-level waste.

Alternative methods of decommissioning are available under the amendments to 10 CFR Part 50, including delay in completion of decommissioning during which time there can be storage of wastes. Delay in decommissioning can result in a reduction of occupational dose and waste volume due to radioactive decay. In addition, provisions are made in the amendments to 10 CFR Part 50 to assure adequate funds for the completion of decommissioning. As discussed in Section H.1.1.2, plans submitted by licensees five years

prior to projected termination of operations will assess relevant up-to-date information which could be important to adequate planning for decommissioning well before the decommissioning actually begins and these considerations will likely include the then current waste disposal situation as it affects the decommissioning.

#### 5. Comment Summary

Two commenters stated that the rule should require licensees to minimize the amount of waste produced, holding them to an "as low as reasonably achievable" standard. In addition, the commenter indicated that waste packages should be required to meet material integrity requirements to prevent them from falling apart due to corrosion, improper packing, effects of chemicals, and exposure to the elements. (86, 103)

#### Comment Analysis and Response

In 1981, the Nuclear Regulatory Commission announced the establishment of a policy that addresses the need for waste generators to minimize the quantity of waste produced. This policy also states that NRC will take expeditious action on requests for licensing of volume reduction systems. Decommissioning wastes will be required to be packaged in accordance with applicable packaging requirements, and packaging of these wastes is beyond the scope of this rulemaking action.

### H.1.2 Concerns with disposal of chemical wastes

#### 1. Comment Summary

Some commenters were concerned over the disposal of chelating agents which are present in the chemical solutions used in system decontaminations during decommissioning. The commenters indicate that the chelate agents may cause enhanced migration of radionuclides at low-level waste burial grounds and that insufficient research has been done to establish safety of disposal. Comment suggestions for alleviating the problems include (1) exclusion of these wastes from LLW sites without full assurance that migration problems will not occur, (2) use of physical barriers in the burial grounds, and (3) incineration of the chelating agent and disposal of the product. A commenter was concerned over disposal of non-radiological wastes. (9, 18, 52, 57, 71, 86, 92, 93, 103)

#### Comment Analysis and Response

Considerable research has been done on the interactions between chelating agents and radionuclides, most notably by Pacific Northwest Laboratory, Brookhaven National Laboratory, and Idaho National Engineering Laboratory. According to 10 CFR Part 61, the methods to be employed in handling chelating agents must be described in a license application. Treatment and disposal of decommissioning wastes containing chelating agents will be required to be in accord with applicable regulations. Disposal of nonradioactive hazardous waste not necessary for NRC license termination is not covered by these regulations but would be treated by other appropriate agencies having responsibility over these wastes.

## 2. Comment Summary

Two commenters indicated that in order to better evaluate the disposal of chelating agents that the rule should require a licensee to make public the chemical formulas used in decontamination solutions. (86, 103)

### Comment Analysis and Response

The chemical formula of a decontamination solution containing chelating agents can be released to regulatory agencies and to waste disposal operators. Under the provisions of 10 CFR Part 2 pertaining to proprietary information, some of that information may not be subject to public disclosure.

## H.2 Other energy sources

### Comment Summary

Two commenters expressed concern with nuclear power. One commenter suggested that the U.S. should turn to environmentally safe sources of renewable energy. (42, 79)

### Comment Analysis and Response

The purpose of this rulemaking activity is to assure that decommissioning of nuclear facilities is carried out safely. This comment is outside the scope of this rulemaking and outside the scope of the NRC's jurisdiction.

## H.3 Reduce worker dose

### Comment Summary

Three commenters suggested that the permissible level of radiation exposure to nuclear workers should be reduced at least ten-fold. One commenter indicated that this would be consistent with recommendations of a number of health experts, including Dr. Edward Radford and that it is a long overdue action to protect workers' health and safety, especially at this time as NRC establishes decommissioning regulations. (9, 52, 71)

### Comment Analysis and Response

Establishing permissible levels of radiation exposure for nuclear workers is outside the scope of this rulemaking effort. Protection of workers during decommissioning is an important consideration which is addressed by these amendments. The Supplementary Information to the proposed rule views this as an important aspect of both preliminary and final planning. The amendments require licensees to facilitate decommissioning by maintenance of adequate information over the facility life on the design and current condition of the facility and site. Section 50.82 of the amendments requires that the decommissioning plan submitted at the time of the application for termination of license contain a description of controls and limits on procedures and equipment to protect occupational and public health and safety.

Although the amendments address worker protection in these ways, specific establishment of permissible levels of radiation exposure to nuclear workers is outside the scope of this rulemaking effort. Amendments to 10 CFR Part 20, currently underway at NRC, are a more appropriate means of addressing these concerns.

#### H.4 Enforcement

##### Comment Summary

One commenter indicated that any necessary enforcement actions would likely be unfair and misplaced. Specifically NRC civil penalties for violation are not directed at the actual person or manager involved but are ultimately paid by the ratepayer, taxpayer, or stockholder. Also in the case of decommissioning the commenter states that the perpetrator of the act may be removed from the discovery of his violation by as much as 30 to 40 years. (93)

##### Comment Analysis and Response

Compliance with regulations is the ultimate responsibility of the licensee and the Commission holds licensees responsible for the acts of its employees and other agents. If violations occur, the licensee would be subject to appropriate enforcement action. The licensee is responsible for the costs of corrective actions and payment of civil penalties assessed by the Commission, but the source of the funds is not regulated by NRC. Even if a period of time passes prior to discovery of the violation, enforcement action against the licensee can still be taken at that time, particularly if necessary to abate continuing harm from a violation.

#### H.5 Number of copies of ER supplement

##### Comment Summary

One commenter suggested that the requirement for an applicant to retain an additional 109 copies of an environmental report or supplement is excessive, arbitrary, and without basis. (105)

##### Comment Analysis and Response

Section 51.55 containing this requirement covers all environmental reports and supplements to environmental reports for power reactors, testing facilities, fuel reprocessing plants, and isotopic enrichment plants. This section was not modified substantively by this rulemaking, but is contained in the amendments only because of a minor conforming amendment. The number of copies of ER's retained by the applicant is outside the scope of this rulemaking and any change would have to be considered separately.



I. References

1. 50 FR 5600, February 11, 1985.
2. R. I. Smith, G. J. Konzek, and W. E. Kennedy, Jr., Technology, Safety, and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station, NUREG/CR-0130, Prepared by Pacific Northwest Laboratory for the U.S. Nuclear Regulatory Commission, June 1978, Addendum 1, August 1979, Addendum 2, July 1983, Addendum 3, September 1984, and Addendum 4, (to be published).
3. H. D. Oak et al., Technology, Safety, and Costs of Decommissioning a Reference Boiling Water Reactor Power Station, NUREG/CR-0672, Prepared by Pacific Northwest Laboratory for the U.S. Nuclear Regulatory Commission, June 1980, Addendum 1, July 1983, Addendum 2, September 1984, and Addendum 3 (to be published).
4. G. J. Konzek, Technology, Safety, and Costs of Decommissioning Reference Nuclear Research and Test Reactors, NUREG/CR-1756, Prepared by Pacific Northwest Laboratory for the U.S. Nuclear Regulatory Commission, February 1982, Addendum, July 1983.
5. Norm G. Wittenbrock et al., Technology, Safety, and Costs of Decommissioning Light Water Reactors at a Multiple Reactor Station, NUREG/CR-1755, Prepared by Pacific Northwest Laboratory for U.S. Nuclear Regulatory Commission, January 1982.
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7. E. S. Murphy, Technology, Safety, and Costs of Decommissioning Reference Light Water Reactors Following Accidents, NUREG/CR-2601, Prepared by Pacific Northwest Laboratory for U.S. Nuclear Regulatory Commission, November 1982.
8. K. J. Schneider and C. E. Jenkins, Technology, Safety, and Costs of Decommissioning a Reference Nuclear Fuel Reprocessing Plant, NUREG-0278, Prepared by Pacific Northwest Laboratory for U.S. Nuclear Regulatory Commission, October 1977.
9. H. R. Elder and D. E. Blahnik, Technology, Safety, and Costs of Decommissioning a Reference Uranium Fuel Fabrication Plant, NUREG/CR-1266, Pacific Northwest Laboratory for U.S. Nuclear Regulatory Commission, October 1980.
10. H. R. Elder, Technology, Safety, and Costs of Decommissioning a Reference Uranium Hexafluoride Conversion Plant, NUREG/CR-1757, Prepared by Pacific Northwest Laboratory for U.S. Nuclear Regulatory Commission, October 1981.

11. C. E. Jenkins, E. S. Murphy, and K. J. Schneider, Technology, Safety, and Costs of Decommissioning a Reference Small Mixed Oxide Fuel Fabrication Plant, NUREG/CR-0129, Prepared by Pacific Northwest Laboratory for U.S. Nuclear Regulatory Commission, February 1979.
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13. J. D. Ludwick and E. B. Moore, Technology, Safety, Costs of Decommissioning Reference Independent Spent Fuel Storage Installations, NUREG/CR-2210, Prepared by Pacific Northwest Laboratory for the U.S. Nuclear Regulatory Commission, January 1984.
14. H. K. Elder, Technology, Safety, and Costs of Decommissioning Reference Nuclear Fuel Cycle and Non-Fuel Cycle Facilities Following Postulated Accidents, NUREG/CR-3293, Prepared by Pacific Northwest Laboratory for the U.S. Nuclear Regulatory Commission, May 1985.
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16. C. F. Holoway and J. Witherspoon, Monitoring for Compliance with Decommissioning Termination Survey Criteria, NUREG/CR-2082, Prepared by Oak Ridge National Laboratory for the U.S. Nuclear Regulatory Commission, June 1981.
17. J. P. Witherspoon, Technology and Cost of Termination Surveys Associated With Decommissioning of Nuclear Facilities, NUREG/CR-2241, Prepared by Oak Ridge National Laboratory for U.S. Nuclear Regulatory Commission, January 1982.
18. J. C. Evans et al., Long-Lived Activation Products in Reactor Materials, NUREG/CR-3474, Prepared by Pacific Northwest Laboratory for the U.S. Nuclear Regulatory Commission, August 1984.
19. K. H. Abel et al., Residual Radionuclide Contamination Within and Around Commercial Nuclear Power Plants, NUREG/CR-4289, Prepared by Pacific Northwest Laboratory for the U.S. Nuclear Regulatory Commission, February 1986.
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21. Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, U.S. Nuclear Regulatory Commission, June 1974.
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23. Regulatory Guide 1.143, Design Guidance for Radioactive Waste Management Systems, Structure, and Components Installed in Light-Water-Cooled Nuclear Power Plants, U.S. Nuclear Regulatory Commission, October 1979.
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25. Robert S. Wood, Assuring the Availability of Funds for Decommissioning Nuclear Facilities Draft Report, NUREG-0584, Revision 3, U.S. Nuclear Regulatory Commission, March 1983.
26. Financing Strategies for Nuclear Power Plant Decommissioning, NUREG/CR-1481, Prepared by Temple, Barker, and Sloan, Inc., for the New England Conference of Public Utilities Commissioners, Inc., for U.S. Nuclear Regulatory Commission, July 1980.
27. J. J. Siegel, Utility Financial Stability and the Availability of Funds for Decommissioning, NUREG/CR-3899, Prepared by Engineering and Economics Research, Inc., for the U.S. Nuclear Regulatory Commission, September 1984 and Supplement 1, (to be published).
28. P. L. Chernick et al., Design, Costs, and Acceptability of an Electric Utility Pool for Assuring the Adequacy of Funds for Nuclear Power Plant Decommissioning Expense; NUREG/CR-2370, Prepared by Analysis and Inference, Inc., for U.S. Nuclear Regulatory Commission, December 1981.
29. 50 FR 23960, June 7, 1985.
30. Report on Waste Burial Charges, NUREG-1307, U.S. Nuclear Regulatory Commission, (to be published).



## J. Comment Letters

This section contains copies of the original comment letters received. Each letter is cross-indexed in the margin to the appropriate subsection in sections B through H of this NUREG where comment summaries and staff responses are contained. The subsection number contains the comment summary number where appropriate. Background documents referred to by comments are not included but can be obtained from the Public Document Room (under Federal Register Notice Number 50 FR 5600) where the original versions of the letters are kept.



PROPOSED RULE FR-2644, 50, 51, 10, 12  
(50 FR 5600)

Mar 10 -85

①

G. Lemetry, Sec'y

Sec'y - INO

Wash, DC 20555

ATT: LOCKEILL & SERVICE BRANCH 03:10

Re: Proposed Rule

Decommissioning Criteria

Fed Reg - Feb 11-85 - p 5600

Gentlemen =

The proposed rule seems to have been thoughtfully worked out. But we'd like to comment on two points.

G.1

1 - The figure of \$100 millions in "financial assurance" for decommissioning a reactor gives us a feeling of deja vu. Two examples:

D.1.1.1

In 1970, PPL's initial "ballpark" estimate - to build their Susquehanna reactors was \$500 millions. By Nov-84, final cost had reached \$4.1 billions.

If memory serves, GPU's original estimate for cleanup at TMI 2 was \$300-400 millions. In 1983 it was \$1.034 billions.

If a cleanup job can cost that much, how could a complete decommissioning seriously be envisioned for only \$100 millions?

D.1.1.1

We suggest 50.33(k)(1) be amended to read "...an amount at least \$100,000,000 (1940 dollars)..."

D.2.1(a)

2 - The general discussion (p 5600) says the major environmental impacts expected at decommissioning would be included in the EIS prepared before the plant is licensed to operate. And therefore, there's no need to develop an EIS before decommissioning.

We question whether utilities hire recorders skilled enough to do this accurately. In fact, when a utility applies for a license to build, there's a tendency to understate potential hazards.

F.1

Example: pages enclosed from PPL's initial EIS of July -72, and final EIS of June -81. Both deal with expected gaseous emissions.

In 1972 they listed 12 gases with expected total release of 144 curies, per reactor, per year. By 1981, the list of gases increased to 33, and total release shot up to 16,450 curies per year, per reactor!

Therefore, we strongly recommend a stringent, verifiable EIS be required before a decommissioning license is issued.

Very truly,

G. Lemetry

Ecology/IA-07

Acknowledged by card.....

LOCKEILL & SERVICE  
BRANCH  
MAR 20 1985  
P3:10

MAR 20 1985

5325  
TABLE 5.2.1

EXPECTED GASEOUS EMISSIONS TO THE ATMOSPHERE \*\*  
ANNUAL AVERAGE EMISSION RATE PER UNIT ( $\mu$ Ci/sec)  
*(millionths of a curie)*

<u>Isotope</u>	<u>Half-life*</u>	<u>Off Gas Treatment System Discharge</u>
<del>Krypton</del> Kr-83m	1.86h	0.12
Kr-85m	4.4h	0.39
Kr-85	<u>10.76y</u>	0.002
Kr-87	76m	0.395
<del>Kr-88</del> <del>Xenon</del> Xe-131m	2.8h	0.96
Xe-133m	11.8d	0.085
Xe-133m	2.26d	0.029
Xe-133	5.27d	0.82
Xe-135m	15.6m	0.001
Xe-135	9.14h	1.8
Xe-138	17.5m	0.0014
<del>Nitrogen</del> N-13	<u>9.96m</u>	0.046

12/

Total Per Unit 4.65  $\mu$ Ci/sec<sup>†</sup>  
Total Both Units 9.3

\* Half-life given in minutes (m), hours (h), days (d), or years (y)  
based on Table of Isotopes by Lederer, Hollandar, and Perlman

(12)

*† 12 curies/unit.  
144 " / yr*

\*\*From P.&L's Environmental Impact Statement, BSC Library  
(July -72)

Table 4.4. Calculated Releases of Radioactive Materials in Gaseous Effluents from Susquehanna Nuclear Power Station (Ci/yr per reactor)

Nuclides	Waste-Gas Offgas System	Building Ventilation			Gland Seal and Mechanical Vacuum Pump	Total
		Reactor	Radwaste	Turbine Vent		
Ar-41	a	25	a	a	a	25
Kr-83m	4	b	b	b	b	4
Kr-85m	1,700	6	b	14	b	1,700
Kr-85	270	b	b	b	b	270
Kr-87	b	6	b	26	b	32
Kr-88	670	6	b	46	b	660
Kr-89	b	b	b	b	b	b
Xe-131m	71	b	b	b	b	71
Xe-133m	14	b	b	b	b	14
Xe-133	10,000	130	10	50	2,300	12,500
Xe-135m	b	92	b	130	b	220
Xe-135	b	72	45	130	350	590
Xe-137	b	b	b	b	b	b
Xe-138	b	14	b	280	b	290
I-131	b	$3.4 \times 10^{-2}$	$5 \times 10^{-2}$	$1.9 \times 10^{-2}$	$3 \times 10^{-2}$	$1.2 \times 10^{-1}$
I-133	b	$1.4 \times 10^{-1}$	$1.8 \times 10^{-1}$	$7.6 \times 10^{-2}$	b	$3.3 \times 10^{-1}$
H-3	a	a	a	a	a	69
C-14	8.0	1.5	b	b	b	9.5
Cr-51	a	$6 \times 10^{-6}$	$9 \times 10^{-5}$	$2.6 \times 10^{-5}$	a	$1.2 \times 10^{-4}$
Mn-54	a	$6 \times 10^{-5}$	$3 \times 10^{-4}$	$1.2 \times 10^{-6}$	a	$3.6 \times 10^{-4}$
Fe-59	a	$8 \times 10^{-6}$	$1.5 \times 10^{-4}$	$1 \times 10^{-6}$	a	$1.6 \times 10^{-4}$
Co-58	a	$1.2 \times 10^{-5}$	$4.5 \times 10^{-5}$	$1.2 \times 10^{-6}$	a	$5.8 \times 10^{-5}$
Co-60	a	$2 \times 10^{-4}$	$9 \times 10^{-4}$	$4 \times 10^{-6}$	a	$1.1 \times 10^{-3}$
Zn-65	a	$4 \times 10^{-5}$	$1.5 \times 10^{-5}$	$4 \times 10^{-7}$	a	$5.5 \times 10^{-5}$
Sr-89	a	$1.8 \times 10^{-6}$	$4.5 \times 10^{-6}$	$1.2 \times 10^{-5}$	a	$1.8 \times 10^{-5}$
Sr-90	a	$1 \times 10^{-7}$	$3 \times 10^{-6}$	$4 \times 10^{-8}$	a	$3.1 \times 10^{-6}$
Zr-95	a	$8 \times 10^{-6}$	$5 \times 10^{-7}$	$2 \times 10^{-7}$	a	$8.7 \times 10^{-6}$
Sb-124	a	$4 \times 10^{-6}$	$5 \times 10^{-7}$	$6 \times 10^{-7}$	a	$5.1 \times 10^{-6}$
Cs-134	a	$8 \times 10^{-5}$	$4.5 \times 10^{-5}$	$6 \times 10^{-7}$	$3 \times 10^{-6}$	$1.3 \times 10^{-4}$
Cs-136	a	$6 \times 10^{-6}$	$4.5 \times 10^{-6}$	$1 \times 10^{-7}$	$2 \times 10^{-6}$	$1.3 \times 10^{-3}$
Cs-137	a	$1.1 \times 10^{-4}$	$9 \times 10^{-5}$	$1.2 \times 10^{-6}$	$1 \times 10^{-5}$	$2.1 \times 10^{-4}$
Ba-140	a	$8 \times 10^{-6}$	$1 \times 10^{-5}$	$2.2 \times 10^{-5}$	$1.1 \times 10^{-5}$	$4.2 \times 10^{-5}$
Ce-141	a	$2 \times 10^{-6}$	$2.6 \times 10^{-5}$	$1.2 \times 10^{-6}$	a	$2.9 \times 10^{-5}$

a = less than 1% of total nuclide.

b = less than 1.0 Curie/yr per reactor for noble gases and carbon-14; less than  $10^{-4}$  curie/yr per reactor for iodine.

*Handwritten:* 16,376 = 1364/24



ER 85/254

# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

APR 23 1985 DOCKETED  
USNRC

~~PK-30, 40, 50, 51, 10, 72~~  
(50 FR 5660) (2)

Mr. Samuel J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

85 APR 25 11:18

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Mr. Chilk:

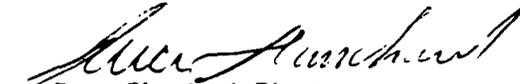
The Department of the Interior has reviewed the proposed rule for Decommissioning Criteria for Nuclear Facilities as noted in the Federal Register on February 11, 1985.

The proposed reduction in environmental review requirements related to decommissioning of nuclear facilities as noted on page 5603 could replace a relatively stringent and in-depth evaluation of potential environmental impacts with a brief and less well documented assessment of possible effects on the human environment. In the past, environmental impacts and related documents prepared for the construction and operating license stages have generally touched very lightly on specific decommissioning impacts, postponing the detailed analysis of specific effects until later in the life of a given facility. Decommissioning would be expected to occur usually at the end of facility life—generally at least 20 to 25 years and often 30 or more years following issuance of an environmental impact statement for construction of a plant. During periods of so many years, decommissioning techniques and alternatives would most probably be modified from those presented in an environmental impact statement for the construction permit or operating license stages. We suggest that the proposed amendments to the regulations should retain the requirement of an environmental impact statement for decommissioning nuclear facilities but permit use of reference to the generic environmental impact statement on decommissioning, when careful study and/or testing at a given nuclear facility has demonstrated that the generic approach is adequate. Review by agencies having jurisdiction and special expertise could then be expedited.

F.1

We hope these comments will be helpful to you.

Sincerely,

  
Bruce Blanchard, Director  
Environmental Project Review

APR 29 1985  
Acknowledged by card...  




Department of Energy

LABOR & INDUSTRIES BUILDING, ROOM 102, SALEM, OREGON 97310 PHONE 378-4040  
TOLL FREE 1-800-221-8035  
USNRC

OCCEAS NUMBER  
PROPOSED RULE **PR-38, 40, 50, 51, 70, 72**  
**(50 FR 5600) (3)**

April 11, 1985

**85 MAY -1 11:32**

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Keith Steyer  
Office of Nuclear Regulatory Research  
US Nuclear Regulatory Commission  
Washington, DC 20555

Dear Mr. Steyer:

We have reviewed the draft Federal rules on nuclear facility decommissioning requirements. The State of Oregon is very interested in these rules since they directly affect the Trojan Nuclear Power Plant within the state.

Prior to receipt of your draft rules, we had begun a review of Trojan decommissioning plans to determine whether adequate plans and funding exist. Many of the points in your draft rules are similar to the areas we have scheduled for review. These include:

1. Storage of spent fuel at the plant site after the operating license has been terminated - Oregon believes it is desirable to remove spent fuel as quickly as possible after the useful operating lifetime to reduce cost to ratepayers and impact upon the environment and public health and safety.
2. Decommissioning Finances - A review of utility efforts to accumulate required finances will be included in the Oregon study. This will also encompass the need for the acquisition of an alternate source of decommissioning funds should the utility default before they are generated.
3. Review of decommissioning plans - The review will consider requirements and scheduling of decommissioning planning. This will include the need for periodic reviews due to changes in financial and regulatory requirements.

See  
Comment  
Letter  
No. 140

Acknowledged by card... **MAY - 3 1985** pd

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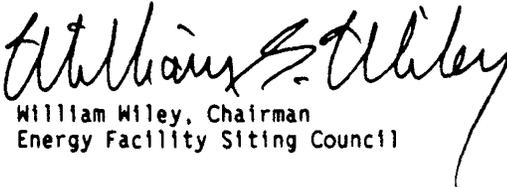
Keith Steyer  
April 11, 1985  
Page 2

4. Options for decommissioning - A determination will be made on the need for limitations on the method the utility will use for decommissioning.

We would like to participate in your rulemaking process. However, our review will include public participation requiring considerable time to complete. We will not be able to complete our comments by your May 13 deadline. Therefore, we request an extension of the comment period by six months--to November 15. We would then have sufficient time to complete our public review process and develop meaningful comments.

If you have any questions, please contact Mike Alsworth of the Oregon Department of Energy at 503-378-6457.

Sincerely,

  
William Wiley, Chairman  
Energy Facility Siting Council

See  
Comment  
Letter  
No. 140

MWA:jt  
95411 (d6,f1)



DOCKET NUMBER  
PROPOSED RULE PR 30, 40, 50, 51, 70, 72  
(50 FR 5600) (4)

STATE OF MINNESOTA  
DEPARTMENT OF PUBLIC SERVICE  
7TH FLOOR AMERICAN CENTER BLDG.  
KELLOGG & ROBERT STS.  
SAINT PAUL 55101

DOCKETED  
USNRC

April 26, 1985

'85 MAY -3 AM 1:15

Docketing and Service Branch  
Secretary of the Commission  
Nuclear Regulatory Commission  
Washington, DC 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Re: Proposed Amendments to Parts 30, 40, 50, 51, 71 and 72 of the  
NRC's Regulations.

Gentlemen:

The Minnesota Department of Public Service is the administrative agency within the State of Minnesota responsible for enforcing state laws regulating public utilities and for enforcing orders of the Minnesota Public Utilities Commission. This letter is written in response to your call for comments regarding proposed changes to NRC regulations regarding the decommissioning of nuclear power plants.

The Minnesota Department of Public Service supports the changes being proposed because they are very similar to the procedure now followed in Minnesota. The state's only nuclear utility, Northern States Power Company, maintains an internal reserve which has funds devoted to the safe disposal of nuclear waste and contaminated equipment at the end of the useful life of its three nuclear plants. Northern States Power collects revenue according to projected decommissioning costs under the DECON alternative. These costs are projected by outside decommissioning experts at least as frequently as once every 5 years. The Department of Public Service requires an annual review of the internal reserve and reconsideration of the appropriateness of key cost assumptions, such as expected future inflation rates. Also, Northern States Power and the Department of Public Service monitor changes in federal tax laws to review the ratepayer cost of alternative funding methods. The internal reserve method has been preferred because it was substantially cheaper than alternative methods, but because of recent federal tax changes there soon may be a change to an external sinking fund. The internal reserve is approximately \$50 million, and is projected to grow to about \$750 million by the time decommissioning begins for the three plants in 2005.

The Department of Public Service believes that our funding method and review procedures provide a reasonable balance between ratepayer cost, fairness, and future environmental concerns. Current electric rates reflect future decommissioning costs to assure that those who benefit

D.8.1

G.1

D.3.2.1.1(b)

AN EQUAL OPPORTUNITY EMPLOYER

3

Acknowledged by card..... MAY - 3 1985

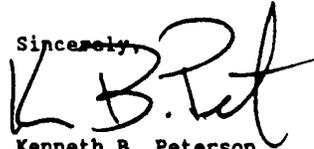
April 26, 1985  
Page Two

from the provision of nuclear power are paying its full economic cost. State certification of the availability of funds has enhanced the public perception of the safety of nuclear plants in Minnesota, as has Northern States Power's purchase of the lawful maximum amount of liability insurance for each of its nuclear plants. We plan to continue our oversight efforts so that the public interest is well-served. We would encourage the NRC to alter its rules as proposed while allowing state agencies to continue the certification of the availability of decommissioning funds.

D.3.2.1.1(b)

D.8.3.1

Sincerely,



Kenneth B. Peterson  
Deputy Director

KBP:NU:md

John P. Forst & Helene Joan Forst  
1 Coronet Lane  
East Hampton, New York 11937

DOCKET NUMBER  
PROPOSED RULE PR-30, 40, 50,  
51, 70, 72  
(50 FR 5600) (5)  
5/2/85  
DOCKETER  
USNRC

'85 MAY -6 AM 10:08

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the NRC Commission  
U.S. N.R.C.  
Wash., D.C. 20555

ATTN: Docketing + Services Branch

My husband and I have been informed that the NRC has finally prepared a proposed decommissioning rule. Unfortunately, it appears to be inadequate + unrealistic. Your rule contains little assurance that there will be adequate funding necessary for complete decommissioning; and that workers will be properly protected. It must also be stated that the reactor site will be restored to a condition allowing safe "unrestricted"

G.1

D.3.2.1.1 (a)

C.1.8.1

B.1.3

MAY - 6 1985  
RECEIVED BY LRU

use.

The rule we are referring to is #50 Fed. Reg 560 of Feb. 11, 1985.

The Decommissioning methods, Decon, safstor, + Entomb are vaguely defined and need clarification. The rule should forbid Entomb, because of the presence of long-lived radionuclides. The rule further makes no guidelines as to how a utility should make the choice as to which method to choose. The rule should spell out specific criteria by which a utility's decision can be ~~governed~~<sup>governed</sup> + reviewed.

B.2.1

B.5

B.3.1.1

The rule as proposed offers no guidelines for ~~the~~ conducting the decommissioning. The Commission need to minimize worker exposure.

C.1.3

C.1.8.1

The establishment of a separate quality assurance + control staff needs to be required. The rule should

C.6

C.1.3

John P. Forst & Helene Joan Forst  
1 Coronet Lane  
East Hampton, New York 11937

spell out basic safety practices, | C.1.3  
The issue of radioactive |  
waste disposal needs to be addressed. | H.1.1.1  
There should be no low-level |  
waste dumps allowed. | H.1.1.3  
Please also be certain that |  
there will be adequate funding. | D.8.1  
Thank you.

Sincerely,

Helene & Jack  
Forst

\* NOTE: This has been typed by NRC because when reproduced it was difficult to read.

"spell out basic safety practices.

The issue of radioactive  
waste disposal needs to be addressed.  
There should be no low-level  
waste dumps allowed.

Please also be certain that  
there will be adequate funding.

Thank you.

Sincerely

Helene & Jack  
Forst

J-11

DOCKET NUMBER  
PROPOSED RULE PR-30, 40, 50, 51,  
(50 FR 5600) 70, 72  
⑥

3103 David Avenue  
Palo Alto, Calif. 94303  
April 30, 1985

SECRET  
USNRC

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

85 MAY -6 11:07

Attention: Docketing and Service Branch

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Sirs:

It has come to my attention that the NRC plans to promulgate a rule which will allow for the unsegregated accumulation of decommissioning funds.

Decommissioning is going to be too serious an event in a few short years, both from a safety point and an economic point of view to leave to more chance than acceptable that the funds that are set aside will really be there when the actual decommissioning takes place.

If unsegregated funds are used to acquire assets before the day of decommissioning arrives, where will the liquidity be in order to assure the availability of cash or equivalent to do the job? Lack of segregation of such funds is an invitation to sudden rate boosts or else delays in actually undertaking proper decommissioning.

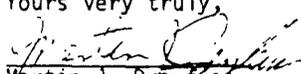
I urge you to include in your rule-making the segregation of such funds. Funds have to be available not only for normal expectations of shutdown but also to take into account unforeseen contingencies that will result in premature shutdown. Also, unless funds for decommissioning are rigidly segregated, what funds will be available in the case of bankruptcy, ala WPPS!?

In addition, make sure parent holding companies do not evade liability for decommissioning costs. Also, what the liabilities really may be should be subject to revaluation by restudying decommissioning costs at least every five years.

Two more provisos are most important in order to establish liability and accountability. Allow no tax deductions for funding decommissioning costs unless the funds are segregated and establish a provision that utility stockholders be responsible for any decommissioning costs not collected from the rate payers during the operating life of any plant.

Please give serious consideration to these comments. Not enough has yet been done. Not to segregate decommissioning funds would only cause further uncertainty as to effective and economic action when the day of decommissioning comes.

Yours very truly,

  
Martin J. Dreyfuss

D. 8. 1

D. 3. 2. 1. 1(a)

D. 3. 2. 2. 1

D. 3. 2. 1. 1(a)

D. 8. 2. 1

D. 4. 3

D. 5

D. 8. 2. 2

D. 8. 1

D. 3. 2. 1. 1(a)

MAY -6 11:07  
...revalued by ...

SECRET SUBJECT  
 PROVIDED DATE PR-30,40,50,51,70,72  
 (50 FR 5600) (7)

DOCKETING  
 USNRC

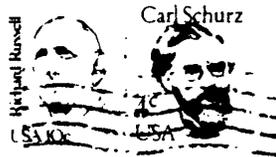
85 MAY -6 P1:04

OFFICE OF  
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Dear Sir: This postcard reproduces  
 from memory the higher  
 of a nuclear bomb. Note the  
 effects of ~~ion~~ radiation  
 from a nuclear reactor can  
 also be lethal.  
 I regret that you put  
 into effect the recom-  
 mendations of Public  
 Citizen's Environmental  
 Action re response to  
 for decommissioning costs.  
 Yale Maxon  
 820 Euclid Avenue  
 Berkeley California

4th Maxon Pl D  
 Commander USNRC  
 Retired.

Classified by the flame. A survivor painted the picture  
 memory thirty years after the bombing.



Secretary, Nuclear Regulatory  
 Commission  
 Attn: Docketing & Service  
 Branch  
 Washington DC  
 20555

POST CARD

G.25

D.8.1

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JAMES HUNTER  
DOCKETED CASE PR-30, 40, 50, 51, 70, 72  
(50 FR 5600) (8)

DOCKETED  
USNAC

85 MAY-6 P1:08

KERMIT F. CUFF JR., IS  
945 HIGH SCHOOL WAY AND  
MOUNTAIN VIEW, CA 94041



Historic Preservation USA 13

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attn: Docketing  
and Service Branch

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear People,

5-2-85

I'm writing to comment on the Nuclear Regulatory Commission's proposed rule for decommissioning nuclear reactors. I find this proposal unacceptable, especially regarding the use of unsegregated decommissioning funds. This money could be used to finance construction of new power plants by utilities. Also, the NRC would no longer be required to prepare an environmental impact report on decommissioning reactors thus reducing the possibility for public comment periods and reviews by other agencies. And finally, the possibility of insolvency and its impact on the availability of decommissioning funds should be addressed. Thank you.

Sincerely,  
Kermit Cuff Jr.

G.1, D.8.1

D.3.2.1.1(a)

F.1.

D.3.2.1.1(a)

MAY - 6 1985

Acknowledged by card.....

# Public Citizen

# Environmental Action

PROPOSED RULE NUMBER **PR-30,40,50,51,70,72** DOCKETED USNRC  
PROPOSED RULE **(50 FR 5600) ⑨** **'85 MAY -6 P3:00**

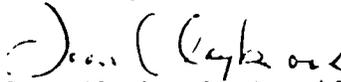
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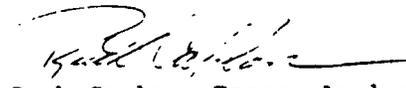
Dear Commissioner:

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

We are enclosing a copy of our report, "Dismantling the Myths About Nuclear Decommissioning," which we released earlier this month. We submit this report for the record as partial comment on the proposed rule and urge your consideration of its findings and recommendations.

Sincerely yours,

  
 Joan Claybrook, President  
 Public Citizen

  
 Ruth Caplan, Energy Analyst  
 Environmental Action

Acknowledged by card.....*5/6/85*

Environmental Action • 724 Dupont Circle Building, N.W., Washington, D.C. 20036  
 Public Citizen • 2000 P Street N.W., Washington, D.C. 20036

ERRATA SHEET

'85 MAY -6 P3:01

Footnotes to Chapter 6 are as follows:

OFFICE OF SECRETARY  
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BRANCH

1. U.S. General Accounting Office 1977: 25.
2. "Decommissioning Criteria for Nuclear Facilities," Federal Register,  
February 11, 1985: 5600-5625.
3. Chapman, personal communication: March, 1985.
4. U.S. General Accounting Office 1977: 25.
5. Federal Register, Ibid: 5609.
6. Atomic Industrial Forum 1983.
7. Engineering News Record 1984:26.

Footnote references for Chapter 7 should be deleted.

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**DISMANTLING  
THE MYTHS ABOUT  
NUCLEAR  
DECOMMISSIONING**

---

Sally Hindman  
Principal Researcher  
© Public Citizen/Environmental Action 1985

Copies of this book may be obtained by sending \$10 for individuals and non-profit groups, \$20 for government agencies and \$50 for corporations to either Public Citizen, 2000 P Street, N.W., Suite 605, Washington D.C. 20036 or Environmental Action, 724 Dupont Circle Bldg., N.W., Washington, D.C. 20036.

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Andy Feeney assisted with editing. Others contributing to the production of the report include Brian Carney, Jan Pilarski, Christine Beekman, Beth Elliot, Ann Harter, John Kelly, Jeanne Lawson, Susan Lockwood, Paul Markowitz, Leslie Milofsky, Liz O'Donnell.

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## Chapter One Introduction

*It is unthinkable that the United States should continue nuclear power plant construction without a national program of radioactive waste disposal and decommissioning, without a clear delineation of Federal, State, and private responsibility for waste disposal and decommissioning, and without a sense of urgency and priority on the part of government to address this growing problem*

— U. S. House of Representatives  
Committee on  
Government Operations, 1978, p.4

When Americans first visualized a nuclear future, most of us didn't think about reactors entering old age. We did not envision highly radioactive reactors sitting dormant on thousands of acres of land, vulnerable to earthquakes and tornadoes for generations to come. We did not worry about people slipping through the ring of barbed wire that is supposed to surround retired reactors and carrying a burden of radioactivity back to the outside world.

Now, however, with accounts of children playing in pools of toxic chemicals at Love Canal and knowledge of the near-meltdown at the Three Mile Island nuclear plant, the possible perils of long-term environmental contamination from toxics and radioactivity have become clear. As a result, citizen organizations across the country have begun to grapple with the problem of what to do with nuclear waste. This report concerns one aspect of the problem: what should be done with highly radioactive reactors which are no longer operating. The process for dealing with this problem is called "decommissioning."

The first major action by citizens took place in 1977 when twelve national organizations questioned how utilities would fund decommissioning. In a petition to the Nuclear Regulatory Commission (NRC), the groups urged that regulations be developed to require nuclear utilities to take financial responsibility for decommissioning in order to assure protection of future generations. The NRC agreed to develop regulations, a process which has yet to be completed. In 1978, when Congress held hearings on nuclear power costs, the long-neglected issue of decommissioning came to public attention. The hearings examined financial costs and technical problems, establishing that inaction could lead to a potential crisis. Although some members of Congress appeared concerned, no specific action was taken.

However, by the following year the electric utilities themselves had begun to develop plans for decommissioning funds, subject to the approval of their state regulatory commissions. Unfortunately, the development of state regulations has been hampered by the absence of federal guidelines, since states are concerned that their policies could be subsequently overturned by federal regulations.

In the absence of federal guidelines, the utilities have begun to address the physical methods to be used in decommissioning, their likely cost and methods of recovering these costs. But such laissez-faire development of private decommissioning policies, in the absence of strong government regulations, has created a number of serious problems. For example, the three decommissioning methods currently allowed by the proposed NRC ruling, all have major financial risks associated with them and may ultimately prove to be unsafe. Utility cost estimates for decommissioning are also extremely low. This may place an unfair burden on future ratepayers and endanger the financial viability of decommissioning itself. Finally, the most common methods of accumulating funds for decommissioning provide little assurance that the money collected will actually remain available for decommissioning, since utilities are able to use the funds as a source of "internal capital" for expansion.

To further complicate the problem, there is no commonly accepted definition of decommissioning, because three very different decommissioning methods have been described by nuclear utilities and the government.

"Immediate dismantlement" is the most stringent approach. It involves radioactive decontamination of the site when the reactor is retired, so that the site will meet NRC standards for general public use. The radioactive components are dismantled, including the reactor vessel itself, and are removed from the site. The NRC calls this method DECON.

"Temporary storage" delays decommissioning by taking temporary measures, such as removing the radioactive fuel rods and flushing the pipes, which are intended to allow the idle reactor to be maintained within acceptable bounds for a period of years. Significant amounts of radiation cannot be removed in this manner, however, because the components themselves become radioactive, as a result of neutron bombardment creating "activation products." After temporary storage, full dismantlement is to take place. The NRC calls this SAFSTOR.

"Entombment" simply requires that all radioactive components be encased in a semi-permanent shroud such as steel

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C.1.3

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D.1.1.2

D.3.2.1.1(a)

G.1

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B.1.1.1 reinforced concrete, after limited cleanup and decontamination. The facility would have to be protected from public use for thousands of years while natural radioactive decay takes place. The NRC calls this ENTOMB.

B.5 Because some activation products remain dangerous for hundreds of thousands of years, far outliving the housing of the reactor itself or an entombment shroud, entombment is not a satisfactory decommissioning method from the point of view of public health and safety. Full decommissioning is essential.

G.1 How serious is the potential decommissioning problem? By the end of 1984, 89 commercial nuclear power generating units have received operating licenses in 28 states. Five of these are currently inoperable. Another 36 units are under construction. By 2010, almost 70 reactors will be shut down. Given current trends, however, it is likely that many of these units will be shut down prematurely.

C.1.3 The U.S. has no experience with decommissioning large reactors such as those typically operating today. Nor have other nations. For this reason, it is not easy to predict the difficulty of decommissioning, the safety risks involved, or the costs.

D.1.1.1 The problems yet to be fully understood include the risks of workers being exposed to high levels of radioactivity during the decommissioning process and the sheer difficulty the industry may experience in breaking up very dense, extremely radioactive reactor vessels.

H.1.1.1 The disposal of large quantities of high-level and low-level radioactive waste material, including spent fuel rods, poses another major problem. At present, no permanent facility exists which can safely handle spent fuel from commercial reactors. The U.S. Department of Energy (DOE) is only at the beginning of a long process required by law to select a permanent site for high level waste. The disposal of low-level waste poses physical and political problems given the expected volume and difficulty in classifying such waste.

#### Policy Recommendations

D.8.1 Given the numerous unresolved policy issues which surround the topic of decommissioning, it is time for an end to the complacency which has pervaded the utilities, the NRC, and the public concerning this important part of the nuclear cycle. G.1 Public Citizen and Environmental Action recommend the following federal policies in order to insure that decommissioning will be carried out in a safe and equitable manner:

1. Require prepayment of decommissioning costs held in segregated funds or external sinking funding with premature shutdown insurance. Exclude internal unsegregated funds as a financing option.

D.3.2.2.1 The NRC in its regulatory role is responsible for "ensuring that decommissioning is carried out so as to protect public health and safety." The ability of a funding method to provide "reasonable assurance" of the availability of funds for decommissioning when needed is a key factor in determining which financing methods are allowed by the NRC.

In its study of decommissioning financing methods, the NRC found prepayment of decommissioning funds to provide the greatest assurance of the availability of funds for decommissioning. It was the only method studied which was shown

to provide adequate assurance of the availability of funds in the event of premature shutdown and utility financial crisis. We believe that prepayment held in segregated funds is the only funding method which is adequate without decommissioning insurance to compensate for possible non-availability of funds due to premature shutdown or utility financial crisis.

External sinking funding was found by the NRC to provide the next greatest assurance of the availability of funds for decommissioning. This method, however, is vulnerable in the event that premature shutdown is necessary. All five of today's inoperable reactors experienced premature shutdown. Therefore, the NRC should require that the use of this method be coupled with premature shutdown insurance.

Internal segregated funding was found to be vulnerable in the event of utility bankruptcy or other severe financial problems. Therefore, we recommend that, if this method is allowed at all, it should be combined with decommissioning insurance to cover utilities in the event of financial difficulties including bankruptcy, as well as coverage for premature shutdown.

Internal unsegregated funding has been shown by the NRC to provide the least assurance that funds will be available when needed. According to the NRC, this option is "vulnerable to any event or situation that significantly undermines the financial solvency of a utility."

Since no funds are physically set aside for decommissioning when this method is used, unsegregated funding should not be included as a method of financing. Rather, it serves as an accounting procedure allowing utilities to acquire capital from ratepayers for plant construction, without having to compete in the bond market. Utilities using this method hope to raise the funds needed for the task in 60-80 years when decommissioning takes place. This is clearly not an acceptable financing option.

2. Fund a major independent study of decommissioning costs and problems by the Congressional Office of Technology Assessment.

Battelle's study of the costs, safety and technology of decommissioning is the only detailed, in-depth work to date on decommissioning a reference PWR and BWR. It has been used, directly and indirectly, by a majority of utilities in developing decommissioning cost estimates.

Unfortunately, the Battelle study may be heavily biased toward underestimating the costs and problems of decommissioning. Battelle Pacific Northwest Laboratory is a member of the Atomic Industrial Forum, the research and lobbying arm of the nuclear industry, and has private contracts with electric utilities. Over 86 percent of its work is for the Department of Energy, which has actively promoted nuclear power.

To date there has been no major independent study of the costs, technology and safety of decommissioning nuclear plants. We believe that a detailed independent study of decommissioning must be carried out in order to more accurately determine (or verify) the costs and problems associated with this event. The Congressional Office of Technology Assessment (OTA) should be designated to prepare an objective assessment of decommissioning costs and risks, assuming the advisory panel has broad representation including independent scientists and environmental and consumer advocates.

D.3.2.2.1

D.3.2.1.1(a)

G.16

**3. Require an Environmental Impact Statement as a decommissioning prerequisite for each reactor, with full opportunity for public comment.**

Under the National Environmental Policy Act (NEPA) an environmental impact statement (EIS) is required for any Federal action significantly affecting the quality of the environment. The decommissioning of a reactor in order to return the land to unrestricted public use is clearly an action with a significant impact on the environment. Discussion of decommissioning in an EIS should be required at two stages.

First, there should be discussion of decommissioning costs and available methods in the EIS prepared at the time of the construction license, so that potential environmental impacts and the full cost of the nuclear alternative can be assessed before irreversible commitments are made to the technology.

Second, a full EIS should be prepared at the time a utility submits its decommissioning plan to the NRC for approval. Under the NRC proposed guidelines, this would occur near the end of the operating life of the reactor. The EIS should spell out available options regarding methods of decommissioning and their environmental impacts. Given the potential consequences for public health and safety and the unavailability of the land if the plant is put in temporary storage for 30-100 years, public input to the decision-making process is essential at this stage.

The NRC's proposed rule substitutes an environmental assessment for an EIS, thus skirting the need to consider public comment in its decision-making process and attempting to downgrade the environmental significance of decommissioning. Such a policy runs counter to the National Environmental Policy Act. Contrary to what the NRC proposes, there usually will be significant impacts associated with decommissioning. As such, the NRC's general rule should err on the side of safety by requiring an Environmental Impact Statement in order to evaluate the different ways of mitigating those impacts.

**4. Reclassify decommissioning waste products and exclude components with long-lived activation products from low-level nuclear waste sites.**

At present, major reactor components have not been classified as high-level or low-level nuclear waste. Components which will have to be disposed of after dismantlement include the core shroud, lower core barrel, thermal neutron shield pads, and upper and lower core grid pieces. All of these components contain nickel-59 and niobium-94 with half-lives of 20,000 and 80,000 years respectively. According to the NRC, these components do not fall within the definition of high-level waste.

We believe radioactive wastes resulting from decommissioning need to be carefully studied and reclassified. Certainly no wastes containing long-lived activation products such as nickel-59 or niobium-94 should ever be classified as low-level waste and permitted to be buried at low-level radioactive waste landfills.

**5. Establish a 50 year limit on the temporary storage of reactors prior to dismantlement.**

The NRC has not limited the number of years plants can undergo temporary storage prior to dismantlement in its proposed regulations, even though a 30-50 year limit is suggested in the discussion section. Nor has the EPA set standards limiting this period to 100 years, as it had been expected to do. The NRC argues that in setting such a time limit utilities will be encouraged to delay dismantlement to meet this ceiling. We believe there is no reason a utility should be allowed to wait more than fifty years to dismantle a reactor following its shutdown. Occupational exposure levels decrease greatly and level off following a 30 year delay. Low-level waste volume reduction diminishes with a 50-year delay. Therefore, utilities should be required to fully dismantle reactors after a maximum storage period of 50 years. [See Table 19 for half-lives of radionuclides present in major reactor components.]

**6. Exclude chemical decontamination wastes from low-level waste burial unless independent research clearly establishes that low-level disposal is safe.**

Decontamination, a process comprised of running a highly corrosive solvent containing chelating agents through reactor piping systems, has been used in a number of reactors in recent years to clean out radioactive "crud." Decontamination may be used prior to temporary storage, as well as dismantlement.

Utilities today bury wastes generated by decontamination in low-level waste burial grounds. Yet chelating agents present in solvents have been suspected to be responsible for unexpectedly rapid migration of radionuclides beyond the burial trenches.

No study to date has critically examined interactions between chelating agents and other low-level waste products. The independent research assessment on decommissioning costs and risks called for in recommendation two should include an assessment of the problems associated with chelating agents. Until more is known about the interactions of chelating agents with other low-level wastes, decontamination wastes should be excluded from low-level burial grounds. Instead, such waste should be stored in easily monitored above-ground facilities until such time as DOE has established a high-level waste disposal facility or their safe disposal in low-level waste sites has been established with certainty.

**7. Strengthen utility liability for decommissioning costs through legislation.**

A strong trend has developed in the last ten years toward formation of utility holding companies. This could result in the holding company's assets being insulated from liability for decommissioning. Holding companies may also spin off the utility in a weakened state and, thereby, try to avoid liability for decommissioning. In order to guard against such future problems, federal legislation is needed to make the parent holding company liable for decommissioning costs, regardless of whether the utility is subsequently spun-off.

**8. Allow current tax deductions only for segregated decommissioning funds.**

F.1

H.1.1.1

B.4.3

B.4.3

H.1.2.1

D.8.2.1

D.5

D.5

The Deficit Reduction Act of 1984 allows utilities to take a tax deduction for decommissioning costs only when a segregated fund is used with no investment in utility assets or in associated holding company assets. Normally such deductions are allowed only when the expense is incurred, in this case when actual decommissioning takes place. The utilities want a tax deduction of unsegregated funds as well, even though they would use the funds to invest in new utility assets such as powerplants.

respected and prestigious health experts, including Dr. Edward Radford, former chairman of the National Academy of Sciences' Committee on the Biological Effects of Ionizing Radiation (BEIR). It is a long overdue action to protect workers' health and safety. This is an especially timely step to take as the NRC moves to establish comprehensive decommissioning guidelines.

H.3

We recommend that such deductions continue to be allowed only for segregated funds with no investment allowed in holding company assets. This protects ratepayers from having to pay for utility tax expenses on the decommissioning funds when the utility will eventually be eligible for a tax deduction.

12. Establish residual radiation level at a maximum of 10 millirems full body dose at plants released for "unrestricted" use.

The NRC has not included a residual radioactivity standard in the February proposed rule, stating that the standard is being developed in a separate rulemaking action. The Commission is expected to propose a 50 millirem full body dose per year standard, hoping that, by setting ALARA (As Low As Reasonably Achievable) at a 10 millirem level, this is what will actually be achieved. This is not acceptable. Only when the 10 millirem limit is set as a federal standard will there be adequate enforcement of the standard.

E.1.1

9. Revise decommissioning cost estimates at least every five years.

D.4.3

Present decommissioning cost estimates are extremely understated and are likely to be inaccurate by a large margin. The NRC, although encouraging "periodic" update of cost estimates, has established no explicit time frame for cost estimate revisions. Yet as plants grow closer to the end of their operating lives and as experience provides more information about decommissioning costs, these estimates are bound to increase.

In addition to these recommendations for federal action, we recommend the following state actions:

We believe cost estimates should be reviewed and updated on a regular basis, at least every five years, in order to ensure the highest degree of equity to ratepayers and to assure that adequate funds are being collected.

1. Make utility stockholders responsible for decommissioning costs not collected from ratepayers during the operating life of plant.

10. Prohibit entombment as a decommissioning method.

B.5

Entombment would allow a plant, including its radioactive components, to be covered over with steel enforced concrete and left for eternity. Studies carried out by nuclear physicists Resnikoff and Pohl found that the nickel-59 and niobium-94 present in reactor vessels would be radioactive for thousands of years, well beyond the life of any concrete structure.

A fundamental principle of utility regulation is that ratepayers benefitting from the electricity produced by a plant should bear its costs. Yet most utilities accrued few, if any, funds for decommissioning during the first ten years of plant operation. Even now the average industry estimated cost of decommissioning is only \$66 million. Yet the preliminary cost estimates for partially dismantling the 72-megawatt Shippingport reactor are already \$79 million.

D.8.2.2

Although entombment is no longer deemed a viable decommissioning alternative for commercial reactors, the NRC has not explicitly prohibited this method in its decommissioning rule-making. Utilities clearly want this option to remain open. Four plants are currently scheduled for entombment for ratemaking purposes, according to results of Public Citizen's decommissioning survey.

At Humboldt Bay, Indian Point 1, Dresden 1, San Onofre, and Three Mile Island 2 ratepayers never benefitting from electricity produced by plants already suffer from the inequity of paying decommissioning costs for reactors which shut down prematurely. This will ultimately be the case with every reactor unless costs of decommissioning are soon learned.

We believe utilities should not be allowed to collect money in their rates to decommission plants which are no longer operable. Stockholders should be required to pay any decommissioning costs not accounted for during the operating life of plants.

We recommend that the NRC explicitly prohibit the use of entombment in order to assure that utilities will not use this cheaper method when the true costs of full dismantlement are known. This would be consistent with the NRC's definition of decommissioning contained in the proposed rule which requires release of the property to unrestricted use.

2. Require prepayment of external segregated funds in the event the NRC fails to make this national policy.

C.1.10

H.3

11. Reduce the maximum permissible level of radiation exposure to nuclear workers at least ten-fold and establish a worker registry that monitors radiation exposures for all reactor workers, both permanent and temporary.

The proposed rule fails to select the appropriate method of collecting decommissioning funds. If the NRC fails to require utilities to adopt the most reliable funding methods, state regulators should protect the interest of their ratepayers by requiring prepayment or external segregated funds for reactors licensed in their state.

D.8.3.1

H.3

This recommendation is consistent with that of a number of

## Chapter Two

### The Experience of No Experience

*Because of differences in reactor size, type and design, operating time, licensing requirements, motive for installation of the facility, and conditions of concern (e.g. costs, shutdown radiation levels, amounts of radioactive waste), extrapolations from these experiences to large commercial reactors are considered to be generally unreasonable.*

Report of Battelle Pacific Northwest Laboratory, 1978, p. 3-1. (1)

By 1976, when the data for this Battelle report was gathered, more than 60 nuclear reactors in the United States had been decommissioned or were in the process of being decommissioned. While this would appear to provide the industry with substantial experience in decommissioning reactors, the reality is quite different. Most of these were research reactors and all of them were tiny compared with today's typical 1,000-megawatt nuclear power plants. In fact, no nation currently has the experience needed to assess the technical problems of decommissioning large reactors and to estimate future costs.

Table 1 summarizes this country's total decommissioning experience to date. Taken from the research of Lear and Erickson cited in the Battelle report, the table shows 65 licensed nuclear reactors where decommissioning was planned, in process or completed, for the period 1960 through mid-1976. Of these, 52 are research reactors and another is a nuclear ship. Only five are power reactors. (2) Furthermore, the dismantled reactors range in power ratings from less than 1 megawatt to just 22 megawatts. (3)

Of the 65 reactors listed in the table, 13 reactors still have not been dismantled, but are instead entombed or in temporary storage. (4) Of the 52 research reactors, 42 have been fully dismantled, while the remaining 10 are either partially dismantled or still in the planning stage. (5)

The 22-megawatt Elk River unit is the largest reactor dismantled thus far. It was dismantled in 1974 after only four years of operation. Data on how much power it generated or on how much it was running during those four short years and at what power level (capacity utilization) are unavailable. (6) Nevertheless, Elk River serves as our best decommissioning model to date. Its dismantling, along with that of the tiny research reactors decommissioned in the 1960s and 1970s, provides our only actual experience with full decommission-

ing. Data from these reactors, along with simulation models developed from experiments using shipbuilding equipment, have been extrapolated by Battelle for large reactors.

Dr. Duane Chapman, an economist at Cornell University, has pointed out the inadequacy of these data. Chapman estimates that Elk River, with a 62.5% utilization of design capacity, ran for the equivalent of 48 "megawatt-years." By contrast, a hypothetical 1,000-megawatt power plant with a 62% average capacity utilization operating for 30 years will end its useful life after 18,600 "megawatt-years" of operation. (7)

The length of operation is critical to assessing decommissioning. Chapman notes: "There would seem to be little basis for understanding problems related to long-lived radioactive isotopes of plutonium, nickel, and niobium [from Elk River] because the accumulation of such radioactive materials is directly related to length of operations." (8) Because disposing of these long-lived radioactive isotopes is one of the most troubling problems plaguing the decommissioning process, Elk River is an unreliable "best model" for estimating the future decommissioning costs of today's reactors.

Battelle Pacific Northwest Laboratory, the major NRC contractor studying decommissioning has reached conclusions that converge with Chapman's. In a study of pressurized water reactors (PWR's), one of the two major reactor designs, Battelle points to the nation's limited decommissioning experience during the last two decades. The study notes: "Because of differences in reactor size, type and design, operating time, licensing requirements, motive for installation of the facility, and conditions of concerns (e.g. costs, shutdown radiation levels, amounts of radioactive waste), extrapolations from these experiences to large commercial reactors are considered to be generally unreasonable." (9)

One additional nuclear facility, the Saxton Nuclear Experimental Facility in Saxton, Pennsylvania, was placed in temporary storage in 1972. It is scheduled to be dismantled in 1997 by its operator, General Public Utilities Nuclear, the reluctant owner of the crippled Three Mile Island No. 2 reactor. This 7 megawatt plant operated commercially for only 10 years. In addition to its small size and short lifespan, Saxton used plutonium, rather than uranium, as a fuel. (10) These factors make Saxton of little use as a model for estimating future decommissioning costs.

Some utilities have used the ratio of original cost to decommissioning cost of these small reactors as a basis for estimating the probable expense of dismantling their much larger reactors. This approach is of highly questionable validity.

D.I.I.1

ty because of wide variation in costs. For instance, Peter Skinner, with the New York Office of the Attorney General, has found that the dismantlement costs for Elk River were 28 percent of the original facility costs. (11) However, the expected dismantlement costs for Saxton, a \$6 million reactor, are now estimated at around \$12 million—200 percent of the original capital costs. (12)

#### Inoperable Reactors

D.I.I.2

As shown in Table 2, six commercial-scale reactors in the United States are currently inoperable. With one exception, their owners are postponing the day when they will be decommissioned. Such delay means utilities will not have the experience needed to develop sound cost estimates and increases the likelihood that utilities will not set aside adequate funds for future decommissioning. Without such information, ratepayers may face a multi-billion-dollar "rate shock," when decommissioning on a commercial scale actually begins—probably after the turn of the century.

#### Shippingport

The Department of Energy's 72-megawatt Shippingport reactor in Pennsylvania has been inoperable since October 1982, and is the one reactor currently slated for decommissioning. Both DOE and the Committee for Energy Awareness (CEA), the nuclear industry's public relations agency, are presenting Shippingport as a model case of decommissioning which will provide the industry with valuable experience needed in future decommissioning efforts. (13) Shippingport's size—larger than any other reactor yet decommissioned—and the fact that work on it will begin in 1985 both add credence to such claims. However, there is evidence that DOE is throwing away its best chance to learn from Shippingport by choosing a decommissioning method that maximizes short-term economic efficiency at the expense of long-term information gain.

D.I.I.1

Dismantlement of the reactor vessel poses a key cost problem and technological and safety challenge for decommissioning teams because it is the most highly radioactive component. Nevertheless, DOE does not plan to dismantle the Shippingport reactor vessel at all. Instead, the agency plans to cover the relatively small vessel with concrete in order to contain its radiation, then float it by barge to Hanford, Washington for burial. (14)

Unfortunately, the larger reactor vessels of 1,000 MW reactors operating today are unlikely to be good candidates for barge transport or for burial in radioactive landfills. According to an October, 1984, article in *Engineering News-Record*, "... only 10 other reactors could be removed that way. The rest will have to be cut apart remotely and trucked to disposal sites." (15)

In addition to the cost of barging the reactor intact (if indeed a barge could accommodate the weight), the high levels of radioactivity generated over the 30-year life of a large commercial reactor would likely cause problems in complying with shipping classification standards, probably making barge transport impossible. (16) And even if such a vessel could be barged, it would not qualify for disposal in regional low-level

radioactive disposal sites now being established by states. Such large, highly contaminated units would be candidates for deep geologic waste disposal, but it is doubtful that the Department of Energy (DOE) will design shafts with such sizes in mind.

At a time when the nuclear utilities are in critical need of decommissioning experience, the U.S. government is spending \$79 million (\$1987) to decommission a nuclear reactor and employing a method which cannot be used for large reactors. In doing so, DOE is virtually throwing away the opportunity to develop a valid model for future decommissioning efforts.

The estimated cost of the Shippingport decommissioning is about 12 percent of its cost of construction during the 1950's, according to the Committee for Energy Awareness. (17) CEA does not provide a cost estimate if the reactor were to be fully dismantled.

#### Humboldt Bay

D.I.I.1

The Humboldt Bay No. 3 reactor in California has been closed since July, 1976. Its owner and operator, Pacific Gas and Electric Co. (PG&E), petitioned the Nuclear Regulatory Commission in 1983 for permission to decommission the plant in 1985.

But despite the demands of local citizen organizations that the reactor be fully dismantled, PG&E plans to put Humboldt Bay in temporary storage. (18) The preliminary cost for this is estimated at \$16 million, calculated in 1983 dollars. (19) The total expense to PG&E ratepayers by the year 2000 is estimated to be about \$76 million, again in 1983 dollars. (20) At only 65 MW, Humboldt Bay is less than one-tenth the size of most reactors operating today.

#### Dresden

Commonwealth Edison Co.'s 209-megawatt Dresden 1 reactor has been shut down since 1978. The plant was chemically decontaminated in September, 1984, following Commonwealth Edison's August decision to retire the reactor. The utility is likely to place the unit in temporary storage, until its sister units, Dresden 2 and 3, also become inoperable. (21)

#### Indian Point

Consolidated Edison Co.'s Indian Point No. 1 was shut down in 1974. However, it is not scheduled for full decommissioning until Indian Point 2 is also decommissioned sometime around 2006.

#### Three Mile Island No. 1 and 2

The damaged Three Mile Island Unit 2 reactor in Pennsylvania has been closed since 1979. Its owner, General Public Utilities, has no schedule for reopening the plant until the cleanup of its interior is completed, probably in 1988. Its sister unit, Three Mile Island Unit 1, has also been closed since 1979 and remains shut due to questions that regulators have raised about management integrity.

A number of other operating reactors are currently nearing

the end of their useful life, and may soon be candidates for decommissioning. Table 3 lists the nation's oldest reactors and some of their vital statistics.

#### Footnotes, Chapter 2

1. Smith, et al. 1978a:3-1.
2. Ibid:3-2-3-3.
3. Ibid:3-4-3-5.
4. U.S. NRC 1978:12, also cites these reactors as yet to be dismantled.
5. GPU Nuclear 1983.
6. Chapman 1980:53.
7. Ibid.
8. Ibid.
9. Smith, et al. 1978a:3-1.
10. Ernest Fuller (Concerned Citizens for SNEC Safety), personal communication, 15 August and 13 December 1983.
11. Skinner 1977.
12. Burns and Roe 1981:1-3, Ernest Fuller (Concerned Citizens for SNEC Safety), personal communication, 15 August 1983.
13. U.S. Committee for Energy Awareness 1984.
14. Ibid.
15. *Engineering News-Record* 1984:27.
16. Physical difficulty in removing an intact PWR reactor vessel: Wittenbrock 1982. Dr. Carl Feldman has described extremely high radioactivity and cost as making this option difficult. Dr. Carl Feldman (NRC), personal communication, 5 June 1984.
17. U.S. Committee for Energy Awareness 1984.
18. *Nuclear Free Times* 1983a:9.
19. *Savage* 1983:8.
20. *Nuclear Free Times* 1983b:8.
21. Jim Tascas (Commonwealth Edison Co.), personal communication, 18 July 1983.



Reactor Facility and Location	Reactor Type	Reactor Thermal Rating, MW (a)	Type of Decommissioning	Monitoring System	Protective Storage Measures
CVTR Parr, SC	Pressure tube heavy water	65.0	Mothballing	Periodic surveillance	Welded closure, locked doors, security fence
Pathfinder Sioux Falls, SD	BWR nuclear superheat	190.0	Mothballing steam plant conversion	Continuous security force (b)	Welded closure, security fence
FERMI 1 Monroe Co., MI	Sodium cooled fast	200.0	Mothballing	Continuous security force (b)	Locked doors, security fence
Peach Bottom 1 York Co., PA	Gas cooled graphite moderated	115.0	Mothballing	Continuous security force (b)	Not yet established
VRWR Alameda Co., CA	BWR	50.0	Mothballing with steam plant conversion	Continuous security force (b)	Locked doors, security fence
NASA Plum Brook Sandusky, OH	Light water	0.1	Mothballing	Continuous security force (b)	Locked doors, security fence
GE EVESR Alameda Co., CA	BWR with nuclear superheat	17.0	Mothballing	Continuous security force (b)	Locked doors, security fence
Saxton, PA	PWR	23.5	Mothballing	Intrusion alarms	Welded closure, locked doors, security fence
SEFOR Strickler, AR	Sodium cooled fast	20.0	Mothballing	Intrusion alarms	Welded closure, locked doors, security fence
Westinghouse Test Reactor Waltz Hill, PA	Bank	60.0	Mothballing	Continuous security force (b)	Locked doors, security fence
B & W Lynchburg, VA	Pool	6.0	Partial dismantling	Not required	Not required
Hallam Hallam, NB	Sodium cooled graphite moderated	256.0	Entombing	Not required	Welded closure, concrete cover, weatherproofed
Piqua Piqua, OH	Organic cooled and moderated	45.5	Entombing	Not required	Welded closure, concrete cover, waterproofed
BONUS Ricon. Puerto Rico	BWR with nuclear superheat	50.0	Entombing	Not required	Welded closure, concrete cover, locked doors, security fence
Elk River Elk River, MN	BWR	58.2	Dismantling & partial conversion	Not required	Not required

TABLE 1. Footnotes

<sup>a</sup>Power ratings are expressed in thermal megawatts. Three thermal megawatts are equal to approximately one electrical megawatt.

<sup>b</sup>The use of a continuous security force was not required by the NRC because continuous manned security was provided for other on-site activities that were unrelated to the decommissioned reactor. If such a force was not present, the NRC might have stipulated manned security or other additional access control measures.

Source: Excerpted from "Decommissioning and Decontamination of Licensed Reactor Facilities and Demonstration Nuclear Power Plants," by P.B. Erickson and G. Lear, U.S. NRC, presented at conference on Decontamination and Decommissioning, Idaho Falls, Idaho, August 19-21, 1975, in W.M. Pahlul, "Estimation of Nuclear Power Plants Decommissioning Costs and Methods" R-822249 & R-822250, PA PUC Trial Staff Expert Testimony on TMI-1 Decommissioning, 4/18/83

Table 2.  
Inoperable Nuclear Power Generating Facilities 1985

Facilities Name and Location	Reactor Type <sup>B</sup>	Power Rating(MW) <sup>C</sup>	Principal Owner	Commercial Operation	Date of Shutdown	Nature of Shutdown	Action Taken or Expected
Humboldt Bay 3 Humboldt Co., CA	B	65.3	Pacific Gas and Electric Co.	1963	07/02/76	Plant Located on earthquake fault. Closed to study possible modifications in plant.	Reactor tentatively scheduled to be put in temporary storage pending NRC approval.
Dresden 1 Greene Co., IL	B	100.0	Commonwealth Edison Co.	1960	10/31/76	Radioactive corrosion products inside piping.	Chemically cleaned September 18, 1984. Decision to put in temporary storage Aug. 31, 1984 pending NRC approval.
Indian Point 1 Westchester Co., NY	P	275.0	Consolidated Edison Co.	1962	10/31/74	Plant had no emergency core cooling system. Shut down in compliance with new AEC regulations.	Simultaneous decommissioning planned-Indian Pt. 1 and 2. Plant will remain shutdown until decommissioning of Indian Pt. 2 in 2006.
Three Mile Island 1 Dauphin Co., PA	P	871.0	General Public Utilities Nuclear; Metropolitan Edison	1974	3/28/79	Closed since accident at Unit 2.	Restart delayed due to unresolved management integrity issues.
Three Mile Island 2 Dauphin Co., PA	P	961.0	General Public Utilities Nuclear; Metropolitan Edison	1978	3/28/79	Major reactor accident	Clean-up will continue through 1986 pending continued funding.
Shippingport Beaver Co., PA	P	72.0	U.S. Dept. of Energy/Duquesne Lt. Co.	1957	10/01/82	DOE research activities completed. No further need for plant to operate.	Unit scheduled for decommissioning starting in 1985. Reactor vessel will be shipped by barge to Hanford, WA for burial.
Fermi 1 Monroe Co., MI	Sodium cooled, fast	200t	Power Reactor Development Co.	1966	-----	Reactor accident.	Reactor put in temporary storage in 1975.
Pathfinder Sioux Falls, SD	B, Super-heating	66.0	Northern States Power Co.	1966	-----	Component failures.	Reactor put in temporary storage in 1975.
Peach Bottom 1 York Co., PA	Gas cooled, graphite moderate	40.0	Philadelphia Electric Co.	1967	-----	-----	Reactor put in temporary storage in 1975.
Bonay Ricon, Puerto Rico	B, nuclear super-heating	50t	-----	1964	-----	-----	Entombed following shutdown.
Piqua Piqua, OH	Organic cooled and moderated	45t	-----	1963	-----	Coolant problems.	Entombed in 1969.
CVTR Parr, BC	Pressure tube, heavy water, (D <sub>2</sub> O) cooled moderated	45t	-----	1963	-----	-----	Reactor put in temporary storage in 1967.
Elk River Elk River, MN	B, fossil fuel super-heating	22.0	U.S. Atomic Energy Commission	1963	-----	-----	Reactor dismantled.
Hallam Hallam, NB	Graphite moderated, sodium cooled	256t	-----	1963	-----	Moderator element problems.	Entombed in 1966.

(-----) indicates this information was not obtained by the author.

<sup>a</sup>Inoperable plants are defined as those which have been closed for over one year with major problems hindering their future operation, or those which have been permanently shutdown

<sup>b</sup>R=Nuclear Heating Water Reactor

P=Pressurized Water Reactor

<sup>c</sup>Units are in electrical megawatts unless indicated by t. t=thermal megawatts. One electrical megawatt equals approximately 3 thermal megawatts

Sources: R.F. Smith, G.J. Kosack, and W.E. Kennedy Jr., *Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station*, NUREG/CR-0130, Vol. 1, (Washington, D.C.: U.S. Nuclear Regulatory Commission, June 1978), pp. 3-2-3-10.  
*Inventory of Power Plants in the United States 1982 Annual*, U.S. D.O.F./E.I.A. 0095 (R2), (Washington, D.C.: U.S. Department of Energy - Energy Information Administration, 1982).  
 U.S. Nuclear Regulatory Commission, *Licensed Operating Reactors - Status Summary Report*, NUREG-0020 Vol. 7, No. 12, (Washington, D.C.: U.S. Nuclear Regulatory Commission, December 1983), pp. 3-4.  
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 Carl Green, Consolidated Edison Co. of NY, New York, NY, personal communication, December 10, 1981.  
 Dennis Pooler, Pacific Gas and Electric Co., San Francisco, CA, personal communication, July 27, 1983.  
 Jim Tascas, Commonwealth Edison Co., Chicago, IL, personal communication, July 18, 1983.  
 Jerry D. White, U.S. Department of Energy, Richland, WA, personal communications, July 26, 1983.

Table 3.  
 Commercial Power Generating Reactor Decommissioning Candidates 2005

Reactor	Year of Commercial Operation (b)	Operating License Expiration	Net MWE (c)	MDC Net (d)
Shippingport	1957	(e)	72	----
Dresden 1	1960	1996	207	----
Yankee Rowe	1961	1997	175	69.7(g)
Indian Pt. 1	1962	(e)	275	----
Big Rock Pt.	1963	2000	63	57.2(g)
Humboldt Bay	1963	(e)	65	----
Conn. Yankee	1968	2004	582	82.4(g)
San Onofre 1	1968	2004	436	----
La Crosse	1969	(f)	50	47.7(g)
Nine Mile Pt. 1	1969	2005	620	58.1(g)
Oyster Creek	1969	(f)	650	58.5(g)
Monticello	1971	2002	545	74.6(g)
Prairie Island 1	1973	2005	530	76.5(g)
Prairie Island 2	1974	2005	530	80.6(g)
Three Mile Island 2	1978	(e)	906	----

TABLE 3 Footnotes

<sup>a</sup>This table does not take into consideration the likelihood of necessary premature shutdown due to accidents or other problems. Nor does it consider potential for operating license renewal

<sup>b</sup>Year of commercial operation is the date the unit was declared by the utility owner to be available for the regular production of electricity usually related to satisfactory completion of qualification tests as specified in the purchase contract and to accounting policies and practices of utility

<sup>c</sup>Net MWe is the design electrical rating. This is the nominal net electrical output of the unit specified by the utility and used for the purpose of plant design

<sup>d</sup>MDC net is the maximum dependable capacity less the normal station service loads.

<sup>e</sup>Operating license expiration dates are not included for units which are permanently shutdown

<sup>f</sup>The plant has a provisional license but never received a full term operating license. Therefore, there is no operating license expiration date

<sup>g</sup>Item calculated using a weighted average

Sources: *Licensed Operating Reactors - Status Summary Report*, NUREG-0020 Vol. 7, No. 12 (Washington, DC: U.S. Nuclear Regulatory Commission, February 1984)

"Nuclear Power Plants in The United States," Atomic Industrial Forum, Inc. (Washington D.C.: Atomic Industrial Forum Inc., 1984)

Table 4.  
Decommissioning Policy Data for Licensed Commercial Nuclear Power Plants 1984

Unit	Operating License Expiration Year	Tentatively Scheduled Decommissioning Method <sup>2</sup>	Financing Method <sup>3</sup>	Estimated Cost of Decommissioning <sup>4</sup> (millions of dollars)	Years Dollars In which Reported	1983 Estimated Cost of Decommissioning <sup>5</sup> (millions of dollars)	Funds Collected to Date by Principle Unit Owners <sup>6</sup> (millions of dollars)
Joseph M. Farley 1	2012	DECON	IUF	37.0	1981	42.2	9.6
Joseph M. Farley 2	2012	DECON	IUF	37.0	1981	42.2	3.4
Browns Ferry 1	2010	DECON	ISF	57.0	1983	57.0	
Browns Ferry 2	2010	DECON	ISF	57.0	1983	57.0	30.0 <sup>33</sup>
Browns Ferry 3	2010	DECON	ISF	57.0	1983	57.0	
Arkansas Nuclear 1	2008	DECON <sup>14</sup>	IUF	20.6	1975	36.7	9.2 <sup>34</sup>
Arkansas Nuclear 2	2012	DECON <sup>14</sup>	IUF	21.5	1975	38.3	3.4 <sup>34</sup>
Humboldt Bay 3 <sup>7</sup>		TEMPSTOR	IUF <sup>17</sup>	62.0 <sup>20</sup>	1983	62.0 <sup>20</sup>	.5
Diablo Canyon 1 <sup>8</sup>	None <sup>11</sup>	DECON	IUF <sup>17</sup>	123.6	1985	109.0 <sup>26</sup>	None collected
Rancho Seco 1	2008	Undetermined	ISF	113.0	1983	113.0	21.1
San Onofre 1	2004	DECON	IUF <sup>17</sup>	110.5	1984	104.3 <sup>27</sup>	16.7
San Onofre 2	2011	DECON	IUF <sup>17</sup>	113.3	1984	106.8 <sup>27</sup>	1.2
San Onofre 3	2013	DECON	IUF <sup>17</sup>	130.7 <sup>21</sup>	1984	123.3 <sup>27</sup>	None collected
Ft. St. Vrain	2008	Undetermined	ESF	35.0	1981	39.9	2.7
Ox. Yankee	2004	DECON	IUF	87.6	1983	87.6	11.8
Millstone 1	2006	DECON	IUF	125.5	1984	117.3 <sup>28</sup>	10.8
Millstone 2	2010	DECON	IUF	128.7	1984	118.4 <sup>28</sup>	12.4
Crystal River 3	2008	DECON	ISF	84.4	1983	84.4	11.3
Turkey Point 3	2007	DECON	ISF	80.3	1983	80.3	16.2 <sup>35</sup>
Turkey Point 4	2007	DECON	ISF	58.6	1983	58.6	16.2 <sup>35</sup>
St. Lucie 1	2010	DECON	ISF	86.6	1983	86.6	16.2 <sup>35</sup>
St. Lucie 2	2023	DECON	ISF	74.5	1983	74.5	----
Edwin I. Hatch 1	2014	DECON	IUF	125.7	1982	133.2	10.1
Edwin I. Hatch 2	2018	DECON	IUF		1982		
Dresden 1 <sup>7</sup>	1996	DECON	IUF	38.4 <sup>22</sup>	1983	38.4 <sup>22</sup>	
Dresden 2	----- <sup>12</sup>	DECON	IUF		1983		
Dresden 3	2008	DECON	IUF	138.0	1983	138.0	
Zion 1	2008	DECON	IUF		1983		
Zion 2	2008	DECON	IUF	112.6	1983	112.6	
Quad Cities 1	2007	DECON	IUF		1983		
Quad Cities 2	2007	DECON	IUF	103.1	1983	103.1	
La Salle 1	2022	DECON	IUF	81.1	1983	81.1	
Duane Arnold	2010	Undetermined	None	None	None	None	None collected
Maine Yankee	2008	DECON	ESF	122.0	1983	122.0	2.1
Calvert Cliffs 1	2009	DECON	IUF	333.0	2009	93.7 <sup>29</sup>	8.2
Calvert Cliffs 2	2009	DECON	IUF		2009		
Pilgrim 1	2008	DECON	ESF	87.3	1983	87.3	2.0 <sup>37</sup>
Yankee Rowe	1997	DECON	ESF	40.0	1983	40.0	----

Total for all units = 84.7<sup>36</sup>

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Big Rock Point	2000	DECON	IUF	35.0	1982	37.1	3.4
Palisades	2007	TEMPSTOR	IUF	60.7	1978	88.8	
Donald C. Cook 1	2009	Undetermined	None	155.0	1982	164.3	9.7 <sup>28</sup>
Donald C. Cook 2	2008	Undetermined	None		1982		
Monticello	2002	DECON	IUF	54.6	1979	73.7	13.9 <sup>29</sup>
Prairie Island 1	2005	DECON	IUF	51.7	1979	69.8	14.3 <sup>29</sup>
Prairie Island 2	2005	DECON	IUF	14.8	1979	20.0	6.7 <sup>29</sup>
Grand Gulf 1 <sup>8</sup>	2014 <sup>13</sup>	DECON	---- <sup>18</sup>	93.5	1981	106.6	None collected
Cooper	2008	DECON	ISP	89.6	1983	89.6	None collected
Ft. Calhoun 1	2008	DECON	ISP	87.4	1983	87.4	1.5
Oyster Creek	---- <sup>12</sup>	ENTOMB	IUF	100.0	2003	55.4 <sup>30</sup>	11.7
Salem 1	2008	Undetermined	IUF	210.0	1981	239.4	---- <sup>40</sup>
Salem 2	2008	Undetermined	IUF		1981		---- <sup>40</sup>
Indian Pt. 1 <sup>7</sup>		TEMPSTOR <sup>15</sup>	IUF	92.7	1980	116.3 <sup>31</sup>	38.2
Indian Pt. 2	2006	DECON	IUF				
Indian Pt. 3	2009	DECON	IUF	39.0	1980	48.8	8.9
James A. Fitzpatrick	2010	DECON	IUF	45.0	1980	56.3	9.9
Nine Mile Point 1	2005	DECON	IUF	57.0 <sup>23</sup>	1981	65.0	12.7
Robert E. Ginna	2006	DECON	IUF	37.0 <sup>23</sup>	1979	50.0	10.1
Brunswick 1	2010	ENTOMB+30	IUF	43.9	1979	59.3	10.5 <sup>41</sup>
Brunswick 2	2010	ENTOMB+30	IUF	58.4	1979	78.8	15.3 <sup>41</sup>
McQuire 1	2010	DECON	IUF	50.0	1980	62.5	Unknown
McQuire	2011	DECON	IUF	50.0	1980	62.5	None collected
Davis-Besse 1	2011	ENTOMB+	IUF	53.0	1983	53.0	Unknown
Trojan	2011	ENTOMB+100	IUF	173.0	2011	33.8 <sup>32</sup>	5.2
Beaver Valley 1	2010	DECON	ESP	64.6	1983	64.6	----
Three Mile Island 1 <sup>9</sup>	2011	DECON	ESP	37.3	1983	37.3	.4 <sup>42</sup>
Three Mile Island 2 <sup>7</sup>		Undetermined	ESP	---- <sup>24</sup>	---- <sup>24</sup>	---- <sup>24</sup>	---- <sup>24</sup>
Susquehanna 1	2022	DECON	ESP	229.0 <sup>25</sup>	1983	229.0 <sup>25</sup>	.4
Peach Bottom 2	2008	DECON	ESP	132.0	1982	139.9	---- <sup>27,40</sup>
Peach Bottom 3	2008	DECON	ESP		1982		
Shippingport <sup>7,10</sup>		DECON <sup>16</sup>		79.0	1983	79.0	None collected
H.B. Robinson 2	2007	ENTOMB+30	IUF	44.8	1979	60.5	12.9 <sup>43</sup>
Oconee 1	2007	Undetermined	IUF	50.0	1980	62.5	Unknown
Oconee 2	2007	Undetermined	IUF	50.0	1980	62.5	
Oconee 3	2007	Undetermined	IUF	50.0	1980	62.5	
Summer 1	2013	DECON	ISP	73.0	1982	77.4	---- <sup>44</sup>
Sequoyah 1	2010	DECON	ISP	51.0	1983	51.0	5.0 <sup>33</sup>
Sequoyah 2	2015	DECON	ISP	51.0	1983	51.0	
Vermont Yankee	2007	DECON	ESF <sup>19</sup>	72.7	1981	82.9	.6
Surry 1	2008	TEMPSTOR	IUF	112.4	1983	112.4	Total for all 4
Surry 2	2008	TEMPSTOR	IUF		1983		units = 8.8
North Anna 1	2011	TEMPSTOR	IUF	118.4	1983	118.4	
North Anna 2	2011	TEMPSTOR	IUF		1983		
Hanford-N <sup>10</sup>	None	Not Available	----	----	----	----	None collected
La Crosse	---- <sup>12</sup>	----	----	20.0	1983	20.0	None collected
Point Beach 1	2007	DECON	IUF	101.7	1982	107.8	38.0
Point Beach 2	2008	DECON	IUF		1982		
Kewaunee	2008	DECON	IUF	43.5	1983	43.5	23.0

TABLE 4 Footnotes

<sup>1</sup>This table was compiled from data collected as part of Public Citizen's 1984 decommissioning policy survey. Information was obtained from utilities and state regulatory commissions throughout the country. Survey design and implementation is described in Appendix A of this report. Appendix A also contains a sample questionnaire.

Data collected is current through year end 1983 unless indicated.

Eighty-seven reactors were included in this survey. This included both licensed commercial operating reactors and inoperable units. It included the Hanford-N and Shippingport reactors, somewhat arbitrarily, on the basis of their inclusion in the *Inventory of Power Plants in the United States* (DOE/EIA) over the years. Five units with low power or full power licenses as of Dec. 31, 1983 included: Grand Gulf, Diablo Canyon, San Onofre 3, McGuire 2 and La Salle 1. As of Dec. 1, 1984, of these only Grand Gulf and Diablo Canyon had not gone into commercial operation.

(-) indicates this data was unavailable.

Appendix B contains background data for these reactors.

<sup>2</sup>" tentatively scheduled" indicates that this method is being used for rate-making purposes by principle utilities. It is assumed that the method used for rate-making purposes is the one which utilities plan to use or are most seriously considering using.

DECON=Immediate dismantlement

TEMPSTOR=Temporary storage

ENTOMB=Entombment

ENTOMB+ =Entombment with delayed dismantlement

ENTOMB+30=Entombment with dismantlement in 30 years

ENTOMB+100=Entombment with dismantlement in 100 years

Undetermined=No specific method is being used for rate making purposes

Chapter 2 of this report defines these methods.

<sup>3</sup>"Financing methods are utilities' means of handling monies collected from ratepayers for decommissioning in order that these funds are available when needed. Unless indicated the method named is used by all utilities in the state where the unit is located. However, since financing methods are often determined on the state level, this does not mean that owners outside the state are using this method. Methods illustrated are those in use by utilities. Policies implemented but not yet in practice have been footnoted.

Chapter 6 of this report defines and discusses financing methods.

IUF=Internal unsegregated funding

ISF=Internal segregated funding

ESF=External sinking funding

<sup>4</sup>The estimated cost of decommissioning is the amount which the principle utility owner and the state regulatory commission involved have determined as the basis on which to collect money from ratepayers for future decommissioning costs. Decommissioning cost estimates established by utilities have been formulated using a wide variety of assumptions. A number of estimates were reported in future years dollars. Others were reported in years dollars as early as 1975. Varying costs (e.g. surveillance and maintenance) had been included as part of estimates depending on the state and the specificity of cost estimation. The survey did not attempt to sort out such assumptions because of the impreciseness of cost estimation for many units.

<sup>5</sup>Figures have been converted to 1983 dollars in order for basic comparison to be made between costs estimates. Conversion was made using: "Handy-Whitman Public Utility Index for Electric Light and Power," Dept. of Commerce, Bureau of Industry Economics, *Construction Review*, Sept.-Oct. 1983, November 1978. The index used for 1983 is based on preliminary data. Handy-Whitman was chosen because it is most specific to costs experienced in the utility industry of indices available. Since decommissioning has never been carried out for a large reactor no one knows which index will be most accurate in reflecting costs of this task.

<sup>6</sup>This refers to principle owners or companies responsible for decommissioning costs. Unit ownership structures can require that individual unit owners each collect funds from ratepayers for decommissioning. However, some plant owner/operators, such as single asset corporations (e.g. Vermont Yankee Atomic Corp.) are responsible for collecting all the funds necessary for decommissioning. Appendix B lists individuals unit owners. Principle owners are designated by an asterisk.

<sup>7</sup>This reactor is permanently inoperable.

<sup>8</sup>As of Dec. 1, 1984, this unit had not yet received its commercial operating license. It was undergoing low-power or full-power testing.

<sup>9</sup>This unit is inoperable as of Dec. 1, 1984. It is unclear if or when the unit might be restarted.

<sup>10</sup>The U.S. Dept. of Energy owns this reactor. Therefore, the government will bear the costs of decommissioning.

<sup>11</sup>No operating license expiration date had been established for Diablo Canyon as of June 1984.

<sup>12</sup>This unit has a provisional operating license as of June 1984. No license expiration date has been established.

<sup>13</sup>The utility involved will be applying for an operating license expiration date of 2022 as soon as the plant receives a commercial license.

<sup>14</sup>This data is current to 1981.

<sup>15</sup>"Indian Point 1 is in what the NRC refers to as the "custodial safe storage" mode. This means that some minor efforts have been made toward stabilizing the reactor but the unit has not undergone many of the procedures required for "passive safe storage" (previously referred to as muthballing). These sub-categories of temporary storage are defined in Chapter 2 of this report.

<sup>16</sup>Shippingport will be decommissioned using a method whereby its reactor vessel will be shipped in one piece by barge to Hanford, WA for burial. Although this might formally fall under the definition of dismantlement, it is an anomaly since today's reactors are expected to have to be broken up onsite.

<sup>17</sup>In April 1983, external sinking funding was adopted conceptually as a requirement for all commercial reactors in California. As of December 1984 the California Public Utilities Commission had not issued a final order pertaining to this subject. A final order requiring implementation is expected sometime in 1985.

<sup>18</sup>Although FERC required external sinking funding for the unit in 1984, funds will not be collected for decommissioning until commercial operation sometime in 1985.

<sup>19</sup>As of October 1, 1983, decommissioning funds for Vermont Yankee have been held in an unmanaged escrow account out of the companies hands, earning money market interest rates. The final settlement agreement whereby FERC required external sinking funding for Vermont Yankee was issued in Spring 1984. The utility plans to develop a professionally managed trust fund by early 1985.

<sup>20</sup>This figure includes estimated costs of putting the unit in temporary storage, as well as dismantlement. It does not include surveillance and maintenance costs.

<sup>21</sup>Costs of dismantling common areas for all three units are included in this figure.

<sup>22</sup>This does not include over \$42 million which will be collected from ratepayers for "decontaminating" Dresden 1.

<sup>23</sup>These figures are current through 1981.

<sup>24</sup>The estimated cost of the TMI Unit 2 clean-up has been approximately \$1 billion since 1980. However, utility assumptions for what is included in this figure seem to have changed. It is unclear to the author whether this figure presently includes provisions for decommissioning. No funds for decommissioning were billed to ratepayers during the time the plant operated.

<sup>25</sup>This value includes costs of decommissioning both Susquehanna 1 & 2.

<sup>26</sup>An inflation rate of 6% percent was assumed by the utility and used to convert figures to 1983 dollars.

<sup>27</sup>The author assumed a 6 percent inflation rate in order to convert figures to 1983 dollars, based on real inflation in recent years. No inflation rate was available from the utility.

<sup>28</sup>An inflation rate of 7 percent was assumed by the utility and used to convert figures to 1983 dollars.

<sup>29</sup>An inflation rate of 5 percent was assumed by the utility and used to convert figures to 1983 dollars.

<sup>30</sup>An inflation rate of 3 percent was assumed by the utility and used to convert figures to 1983 dollars.

<sup>31</sup>An inflation rate of 7.6 percent was used for 1981 and a rate of 8 percent assumed for following years, as established by the New York State Public Service Commission.

<sup>32</sup>An inflation rate of 6 percent was assumed by the utility and used to convert figures to 1983 dollars.

<sup>33</sup>This figure is current to September 31, 1983. According to the utility \$34.9 million has been collected for all 5 TVA plants, approximately \$30 million for Browns Ferry 1, 2 & 3 and \$5 million for Sequoyah 1 & 2.

<sup>34</sup>These values are current to 2/84

<sup>35</sup>These figures are current through Dec. 31, 1981. In 1983 the Florida PSC required utilities to collect \$5.5 million for Turkey Point 3; \$4.0 million for Turkey Point 4; and \$5.0 million for St. Lucie 1. Figures for 1982 are not available. Information on total funds collected for these plants was also not available.

<sup>36</sup>This does not include \$33.5 million collected from ratepayers as "accumulated provision for interim decontamination."

<sup>37</sup>The Mass. Dept. of Public Utilities in July '83 required that \$3.5 million per year be collected for decommissioning Pilgrim 1. In December 1983 this would have totaled approximately \$2.0 million.

<sup>38</sup>This is the estimated annual provision by Indiana Public Service Commission and FERC since March 23, 1983. No funds for decommissioning have been collected in the state of Michigan.

<sup>39</sup>These values are current to Aug. 31, 1983.

<sup>40</sup>Public Service Electric and Gas Co. has collected a total of \$43 million for decommissioning all 4 of its nuclear units: Salem 1 & 2 and Peach Bottom 1 & 2

<sup>41</sup>These values are current to March 31, 1984.

<sup>42</sup>This represents the Pennsylvania utilities share of funds collected from ratepayers 1978-1982.

<sup>43</sup>This figure is current to March 31, 1984

<sup>44</sup>Funds were collected from ratepayers as of March 1984. The exact amount collected is unavailable.

## Chapter Three

### Unexamined Cost Estimates: The Road to Rate Shock?

*There is much uncertainty surrounding this subject and the accuracy of what is currently projected for future decommissioning is equivocal at best.*

R. H. Leasburg,  
Vice President for Nuclear Operations,  
Virginia Electric & Power Co.,  
March 24, 1982 letter to author

*The \$20 million (estimate)—the assistant general manager pulled it out of the wall.*

Richard E. Shimshak,  
Manager of Special Nuclear Projects,  
Dairyland Power Cooperative,  
October 23, 1983,  
personal communication to author

D.I.I.I

While a number of utilities have developed estimates for future decommissioning costs, the basis of these estimates are shaky at best. The results of Public Citizen's survey of cost estimates for decommissioning by individual utilities is set forth in Table 4. The highest estimate was \$122 million for the 825 MW Maine Yankee plant. The lowest estimate was \$20 million for the 50 MW LaCrosse unit run by the Dairyland Power Cooperative in Wisconsin. This chapter will examine the problems with these estimates.

#### The Battelle Studies

The only significant studies of future decommissioning costs ever done in the United States were carried out by Battelle Pacific Northwest Laboratory and published between 1979 and 1982. Unfortunately, there is reason to doubt their reliability because of the limited data available. In addition, the Battelle results have received virtually no formal criticism from individuals or institutions outside of the nuclear industry and the Nuclear Regulatory Commission. Further, reports by the Rand Corporation and the Department of Energy suggest the possibility of large cost overruns when actual decommissioning takes place.

Despite their possible flaws, the Battelle figures are still the most detailed that the utility industry has available for calculating decommissioning costs. The Public Citizen decommissioning survey found that the Battelle studies formed the

basis for utility cost estimates for 13 units and that utilities performed "in-house" studies for 24 units. For 15 units utilities contracted with engineering firms and other outside consultants to develop site-specific decommissioning estimates. These studies have generally been less thorough than Battelle's. (1) The one other engineering study that is widely used by utilities in developing cost estimates was conducted in 1976 by Manion and LaGuardia for the Atomic Industrial Forum, the lobbying arm of the nuclear industry. This was a generic study that was considerably less detailed than Battelle's work. (2) In addition, Manion and LaGuardia have also performed site-specific studies for four plants.

#### The Problems With Battelle's Research

The Battelle studies referred to above include the Battelle pressurized water reactor (PWR) decommissioning study published in 1979, the Battelle boiling water reactor (BWR) study released in 1980, and the Battelle Multi-Reactor Station Decommissioning study released in 1982. These studies were commissioned by the NRC as part of its research on decommissioning, prior to its development of formal guidelines. The studies are based on data taken from the 22-megawatt Elk River decommissioning experience, various simulation experiments concerned with the cutting open of reactor vessels, and the actual operation of reactors.

Table 5 shows the breakdown for Battelle's estimated cost of decommissioning using immediate dismantlement and delayed dismantlement scenarios for a reference PWR and BWR. Estimated decommissioning costs for PWR's ranged from \$61.5 to \$75.2 million and for BWR's, from \$63.7 to \$86.0 million, with immediate dismantlement being the cheapest (1983 dollars)

Other estimates of immediate decommissioning costs range significantly higher. For PWR's, the Atomic Industrial Forum has estimated a range of \$30.1 to 129.3 million, according to the size of the reactor. Analysis and Inference, Inc. has estimated costs from \$173.3 to \$694.9 million for a large PWR, in its study of design, costs and acceptability of a utility self-insurance pool for the NRC. Duane Chapman, an economist at Cornell University, expects costs on the order of \$3 billion for a reference PWR, assuming that the reactor is completely dismantled. Table 6 summarizes these findings.

*Battelle Funding and Lack of Peer Review.* In 1984, a full 86 percent of the planning budget for Battelle PNL came from Department of Energy contracts. The other 14 percent of the

Battelle PNL budget came from other government agencies (including the Nuclear Regulatory Commission), from contracts with the utility-funded Electric Power Research Institute (EPRI), and from contracts with the electric utilities themselves. (3) In addition, Battelle PNL is a member of the Atomic Industrial Forum.

Given Battelle's links with interests which have been promoting nuclear power as an important component of our future energy supplies, the lack of full peer review of the studies casts a shadow on the reliability of the studies. Review of the NRC files on Battelle's three decommissioning studies shows that very few comments have been received. With the exception of a few letters from state regulatory commissions, university faculty members and unaffiliated individuals, all the comments in the NRC file are from utilities and their attorneys and the agency's own staff members. There is no evidence of systematic review from the outside.

*Obsolescence.* Originally, the NRC's plans called for the release of decommissioning guidelines to dovetail with the release of the Battelle studies, allowing the utilities to use Battelle's results in their planning for reactor decommissioning. (4) But the NRC's proposed rule on decommissioning, originally scheduled for release in March 1980 (5), has just been issued in February 1985. Thus the data, which was gathered in 1978 for the Battelle studies, were already seven years old by the time the proposed guidelines were released.

Recent decontamination estimates for the Dresden reactor highlight the obsolescence of the Battelle estimates. Battelle's PWR study estimated the costs of decontamination at a typical PWR nuclear plant as \$280,393 to \$414,713. (6) However, the preliminary estimates for decontamination of the Dresden 1 reactor are already running at more than \$50 million (7)—making Dresden's likely decontamination expense 120 to 180 times higher than Battelle's estimate. (8)

#### Cost Overruns in the Industry

Nuclear plant construction costs in recent years have experienced severe cost overruns. A January, 1984, report by DOE showed that of the 47 reactors surveyed, 36 reactors cost at least twice as much to complete as initially projected and 13 cost at least four times as much. (9) A few units will cost more than 10 times the original estimate.

Largely as a result of such major cost overruns, several major utilities—including the Long Island Lighting Company, Consumers Power Co. of Michigan, and the Public Service Co. of New Hampshire—have become severely overextended and are facing the possibility of bankruptcy. This is becoming a major worry for Wall Street investors. The recent default of the Washington Public Power Supply System on its bonds for two new nuclear units, meanwhile, has created complex political and financial problems for the investment community and some units of government.

What is to prevent similar cost-overflow problems from afflicting the utilities as they go about nuclear decommissioning? The biggest difference between construction and decommissioning is that new plants must be constructed to strict standards because of the radiation which will be produced, while decommissioning itself must take place in a radioactive en-

vironment. Thus, while quality assurance problems that have plagued some well-known reactor construction projects should not be a major factor in decommissioning, costs could escalate in response to regulations to protect workers from exposure to radiation.

To protect workers, much decommissioning work is planned to occur underwater, with submerged workers using arc-welding equipment combined with carefully timed explosives to cut through thick steel and concrete walls—a far cry from a demolition crew just coming in with a wrecking crane. (See Chapter 6 for further discussion.) These precautions could push decommissioning costs for any given reactor as high as, or higher than, the costs incurred during construction.

Decommissioning fits into the "first of a kind" technology which could produce large, unanticipated cost overruns, described in a 1979 study by the Rand Corporation. As shown in Table 7, such overruns averaged around 400 percent for major construction projects completed between 1956 and 1977. The projects surveyed in the study ranged from energy process plants to the acquisition of major weapons systems.

"One of the key factors leading to potential errors in cost estimation for decommissioning," Rand Corporation official Christopher Myers has concluded, "might be the length of time the estimation is made (before) the time work is actually to be completed." (10) When Rand looked specifically at cost estimates for energy process plants, it found that "early estimates and even estimates made well into the definitive design have proven to be poor predictors of pioneer energy process plant cost or performance." (11) This principle should have major implications for decommissioning procedures, since many of the cost estimates which have been made so far for decommissioning will not be tested until at least 30 years from now. Possibly, the decommissioning of some nuclear plants will occur 60 to 80 years after the dates on which such cost estimates were developed. (12)

#### Scaling Up From Shippingport

The Shippingport reactor is supposed to provide a model for estimating future decommissioning costs by utilities. But what is the relationship between decommissioning costs and the size of a reactor? While the NRC and others have acknowledged that reactor size is a significant factor in the cost of decommissioning, available data is sparse. Battelle studied the relationship in a 1979 addendum to its PWR study and found estimated costs of dismantling a "reference" 1000-megawatt reactor to be nearly three times greater than the cost of decommissioning the 175-megawatt Yankee Rowe plant, which was more than five times smaller in size. (13)

Since Shippingport is more than twice as small as Yankee Rowe and more than ten times as small as Battelle's "reference" PWR, it is possible to make a conservative prediction that the cost of decommissioning the reference reactor would be more than three times the cost of dismantling Shippingport. Assuming that estimates that have been made of Shippingport's decommissioning cost totalling \$79 million are correct, (14) we can conservatively predict that the costs of decommissioning a large 1,000-megawatt PWR will be well over \$240

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D.1.1.1

million.

Such scale considerations, however, ignore the fact that Shippingport's decommissioning will remove the reactor vessel intact and transport it in one piece to a remote federally-operated, tax-subsidized waste-disposal facility. This decommissioning technique is unlikely to be used on 1,000-megawatt PWRs, so there are serious problems with extrapolating from Shippingport's costs to come up with figures that will be relevant for the industry as a whole.

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Another problem with decommissioning cost estimates based on the Shippingport experience involves reactor type. Like approximately 63 percent of the reactors now licensed, Shippingport is a PWR; but 35 percent of the licensed reactors are BWRs, which experience higher levels of contamination than PWRs. (15) Such BWRs are likely to have higher decontamination costs than the nation's PWRs, so that basing cost estimates for them on the government's experience with Shippingport is likely to create underestimates of real decontamination expenses.

#### Premature Shutdowns—A Complicating Factor

All the cost estimates discussed above concern the expenses connected with decommissioning a healthy prototype reactor at the end of its useful life. However, technical problems now being experienced at the nation's operating reactors—notably the development of cracks in BWR plants, the embrittlement of reactor pipes due to high radiation dosages, and the occurrence of various mishaps in reactor steam generators—all make it likely that many of today's currently functioning reactors will be shut down prematurely. Our data presented in Table 8 shows that the 18 plants which have been shut down had an average operating life of 12 years.

Early shutdowns are already causing problems, as indicated in Table 9. The table describes the financing provisions which have been adopted for the six reactors that are presently inoperable in the United States. Of the four plants for which financing information has been made available, no funds at all were collected for two reactors—Indian Point No. 1 which operated for 12 years and Three Mile Island No. 2 which operated for less than one year. For the Humboldt Bay reactor, only \$517,000 was collected through 1983, a small part of the \$62 million decommissioning costs which have been projected.

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To the extent that accidental shutdowns damage reactor equipment or allow for the unexpected escape of radioactivity, they could significantly boost the costs of decommissioning. Battelle has examined 'accident scenarios' for both a BWR and a PWR and has estimated the likely decommissioning expenses. The findings for the PWR showed that for three progressively more serious accidents, the dismantlement costs for the reactor would range from \$120 million to \$461 million. (16)

Chapman estimated in 1980 that for an accident involving the severe radioactive contamination of a PWR, decommissioning costs could easily exceed the original costs of plant construction. (17) Hence, the bill for decommissioning a badly damaged PWR could be as high as \$3 billion—or even more, given the costs of reactors being built today. (18)

#### Other Factors Causing Under-Estimate of Decommissioning Costs

Tom Robbins and John Vallance, consultants for the utility industry, state in a recent paper: "While decommissioning costs are well recognized and planned for by the utility industry, there has been a lack of attention to other costs inherent in plant operations termination." (19) They cite the cost of writing off the leftover fuel remaining in a reactor and the cost of decontaminating the plant for its dismantlement by workers.

Robbins and Vallance have shown that the unrecovered fuel costs associated with decommissioning a mature reactor could run as high as 50 percent or more of the cost of decommissioning itself. Robbins states: "While decommissioning costs, for example, are estimated at an average between \$100 to \$200 million per plant, unrecovered fuel costs could run as high as \$50-\$100 million." (20) Therefore, Robbins and Vallance have suggested that these extra fuel revenue requirements should be added to the total costs of decommissioning.

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The costs of decontaminating a reactor before dismantlement (to reduce the dangers of workers being exposed to radiation) will also add significantly to total decommissioning costs, if immediate dismantlement occurs just after shutdown. For example, the cost of dismantling Dresden 1 has been estimated at \$38 million. (21) But this figure does not include more than \$51 million in additional funds that will be spent in 1984 for the decontamination of the unit. (22) The technical problems and costs of decontamination will be discussed further in Chapter 5. Many decommissioning cost estimates used by the utility industry severely underestimate such future expenses or ignore them altogether.

#### Decommissioning Costs as a Percentage of Construction Costs

Utilities often express the cost of decommissioning a nuclear power plant as a percentage of the cost of building it. At least in part, this is because the Battelle studies arrived at the conclusion that future decommissioning costs should amount to 10 percent of the costs of reactor construction. (23)

Charles Komanoff of Komanoff Energy Associates has shown that the capital costs for nuclear plant construction have been badly estimated over the years primarily because their estimates did not account for increasing safety-related design change regulations and quality assurance requirements. (24) For this reason, Komanoff would not automatically link decommissioning costs and construction costs, although this could be used as a rough first cut, provided that the numbers are adjusted for inflation and interest costs for each plant. (25)

Given the extensive uncertainties between construction costs and decommissioning costs, unadjusted construction cost figures provide an unreliable basis for utilities to estimate their decommissioning costs. Yet, as Table 10 indicates, two major nuclear utilities, Commonwealth Edison Co. and Duke Power Co., estimate that decommissioning will cost 10 percent of construction costs. Neither utility has performed any site-specific decommissioning studies at each of their reactors. Nor

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have state regulators questioned these numbers; instead, they are allowing the utilities to collect decommissioning funds from ratepayers based on the 10 percent numbers.

Most utility executives and nuclear industry consultants continue to predict that the future costs of decommissioning will be insignificant. Stone and Webster Engineering Corporation has actually estimated that it would cost more than twice as much to dismantle a half-built reactor than to decommission a similar plant after 30 years of operation. In the first instance, they were testifying in hearings concerning the economics of completing a reactor for which they were the engineer/contractors. In the second instance, they were providing decommissioning estimates for the Atomic Industrial Forum. (26) Such inconsistencies further confirm the uncertainty surrounding estimates of future decommissioning expenses made by the nuclear industry.

#### Aggregate Estimates of Decommissioning Costs

The total costs of decommissioning currently licensed reactors in the U.S. have been estimated by Battelle, the Atomic Industrial Forum, Rand Corp., Analysis and Inference, and economist Duane Chapman for the California Energy Commission. These estimates are set out in Table 11. A more detailed illustration of the cost estimates is provided in Table 6.

Battelle's figure for the full dismantlement of the 84 reactors (excluding Shippingport, Three Mile Island No. 2 and Hanford) comes to \$5.2 billion. AIF's "high" estimate adds up to nearly \$11 billion. Cost overruns equal to those found by the Rand Corporation would put the cost at \$22.5 billion. Analysis and Inference's estimate for the NRC would put the cost as high as \$59.1 billion. The results of the Chapman study would result in a total cost of \$255 billion for completely dismantled reactors. Thus, current estimates of decommissioning vary by a factor of 50. When the same figures are expressed in terms of dollars per installed kilowatt (kw) of nuclear generation in 1983, Battelle's estimate amounts to \$80/kw, the AIF "high" estimate to \$169/kw and the Chapman estimate to \$3933/kw.

Table 12 shows total utility estimated costs by state, as well as costs, assuming the high and low range predictions of Chapman and Battelle. Decommissioning costs by state range from a high of \$618 million for California to a low of \$34 million for Oregon.

The impact of these figures on ratepayers could be considerable, particularly in the event of inflation and cost overruns. Tables 11 and 12 indicate the possible eventual size of the utility industry's decommissioning expense, as well as the total decommissioning costs that could face consumers in each state with nuclear power plants. By subtracting the estimates for decommissioning from the state estimates being used to collect funds, we can estimate the potential decommissioning deficit for states and the country under different scenarios.

#### Is "Rate Shock" Next?

Given the apparent tendency of the nuclear industry to underestimate future decommissioning costs and the inade-

quacy of the funding mechanisms for decommissioning described in the next chapter, electric customers may be in for a "rate shock" when the day of reckoning arrives and the reactor must be decommissioned.

This violates a fundamental principle of utility regulation which is that only those ratepayers benefitting from a power plant's operation should have to pay for the cost of putting that plant into service and maintaining it in the rate base. Utility decommissioning practices that load the expense of decommissioning today's nuclear reactors onto tomorrow's electricity customers are unfair and inequitable and should not be allowed by utility regulators.

A decommissioning "rate shock" could have even more serious consequences than those relating to equitable cost-sharing between generations. Utilities could press to delay decommissioning for as long as possible in order to accumulate the necessary money. The industry might also decide to try to redefine what "full decommissioning" entails, in order to minimize expenses—at the expense, of course, of public safety. For example, utilities may push for permanently entombing as much of the reactor as possible at the original site in order to reduce dismantling and shipping costs.

There are other problems in the story of how the industry is preparing for decommissioning. In the next chapter, we turn to problems arising from the ways in which utilities are planning to finance decommissioning.

#### Footnotes, Chapter 3

1. For example, as described in Smith et al. 1978:12-5, a study by NUS Corp., *San Onofre Nuclear Generating Station Decommissioning Alternatives* includes, "no detailed analyses and no estimates . . . for occupational radiation exposure or for exposure to the public resulting from decommissioning operations. The study also includes little detail of the development of disposal costs for radioactive materials, just the assumed unit costs and the final totals."
2. Manion and LaGuardia 1976:12-4.
3. Larry L. Rader (Battelle Pacific Northwest Labs), personal communication, 27 March 1984.
4. Smith et al. 1978a:1-1.
5. NRC 1978:MBO-3.
6. Smith et al. 1978b:G-25. Costs are cited as ranging between 192,050 to 284,050 in 1978 dollars. This includes an estimated \$23,000 to \$115,000 for the decontaminant; \$105,000 for electrical power; and \$64,050 for staff labor.
7. *Nucleonics Week* 1983a:6.
8. Dr. Carl Feldman of the NRC's decommissioning project, when asked about this cost estimate discrepancy, argued that this was because of the increased care which was required in decontaminating a unit which might be restarted. Personal communication, 9 April 1984.
9. Energy Information Administration 1983:7.
10. Christopher W. Myers (Rand Corp.), Personal Communication, 17 January 1984.
11. Merrow et al. 1979:v.
12. This calculation assumes that cost estimates are developed in the early stages of plant's operation and that they live out their full operating lives. If dismantlement is delayed 30 to 50

years, as discussed in Chapter VI, these costs might not be incurred for at least 60-80 years.

13. Smith and Polentz 1979:2-4.

14. U.S. Committee for Energy Awareness 1984.

15. According to data found in the Battelle PWR (Smith et al. 1978) and BWR (Oak et al. 1980) studies, estimated dismantlement radiation doses (not including transportation for a reference PWE are 1200 person-rems; doses for a BWR are 1,865 person-rems. Costs of dismantlement, as pointed out in Table 7 are \$61.3 and \$63.5 million, respectively, in 1983 current dollars for a PWR and BWR.

16. Murphy and Holter 1982:ix. The best case accident "is postulated to result in 10% fuel cladding failure, no fuel melting, moderate contamination of the containment structure, but no significant physical damage to buildings and equipment." The worst case accident is postulated to result in 100% fuel cladding failure, significant fuel melting and core damage, severe radioactive contamination of the containment structure, moderate radioactive contamination of supporting buildings, and major physical damage to structures and equipment."

17. Chapman 1980. Prof. Chapman has more recently

estimated that these costs would be \$3 billion for a healthy reactor in a non-accident scenario, with complete dismantlement of the reactor. Personal communication 13 May 1984.

18. Costs for nuclear plants built today are typically as high as \$3 billion. Stoler 1984: Diablo Canyon 1 and 2, for example, is estimated to cost \$4.4 billion; Shoreham \$4 billion; Midland 2 \$4.4 billion; and Marble Hill 1 and 2 \$7 billion.

19. *Nucleonics Week* 1983b:9.

20. Ibid.

21. Jim Tascas (Commonwealth Edison), personal communication. 31 October 1983.

22. Ibid: 18 July 1983.

23. Battelle's estimates for the reference PWR, were in 1978 \$421 million. EIA 1983, cites final costs for Trojan, the plant used in the study, as \$448 million in 1976. U.S. Committee for Energy Awareness 1984, describes these costs as "expected to be less than 10 percent of the cost of building it."

24. Charles Komanoff (Komanoff Energy Associates), personal communication, 9 July 1984.

25. Ibid.

26. Percival and Roe, 1981:26.



NRC Total Estimated Costs of Possible Decommissioning Choices for a PWR and BWR 1983

Decommissioning Mode	Unit Type	Decommissioning Costs (Millions \$) Number of Years After Reactor Shutdown Dismantlement is Deferred				
		0	10	30	50	100
Immediate Dismantlement	PWR	61.5	----	----	----	----
	BWR	63.7	----	----	----	----
Preparation for Temporary Storage	PWR	----	18.4	18.4	18.4	18.4
	BWR	----	31.1	31.1	31.1	31.1
Continuing Care	PWR	----	0.9	3.2	5.4	11.4
	BWR	----	0.9	3.1	5.2	10.8
Deferred Dismantlement	PWR	----	54.0	54.0	44.5 <sup>b</sup>	44.4 <sup>b</sup>
	BWR	----	51.8	51.8	38.5 <sup>b</sup>	38.5 <sup>b</sup>
Total Decommissioning Cost	PWR	61.5	73.3	75.6	68.3	74.2
	BWR	63.7	84.0	86.0	74.9	80.3

TABLE 5. Footnotes:

\*BWR=Boiling Water Reactor. The boiling water reactor referred to in the table is a 1155 MWE reference unit used in the Battelle study.

PWR=Pressurized Water Reactor. The pressurized water reactor referred to in the table is a 1175 MWE reference unit used in the Battelle study.

Values include a 25% contingency.

Constant 1978 dollars have been updated to the nearest hundredth of 1983 dollars using "Handy-Whitman Public Utility Index for Electric Light and Power," Dept. of Commerce, Bureau of Industry Economics, *Construction Review*, Sept.-Oct. 1983, November 1978. The index used for 1983 is based on preliminary data. It is debatable which of the many indices available is most accurate in properly updating decommissioning cost estimates. This is especially true since decommissioning costs are yet unknown. Handy-Whitman was chosen as a general index, as reasonable as most for this type of cost estimate updating.

<sup>b</sup>These reduced values result from lesser amounts of contaminated materials for a burial in a licensed disposal site.

Source: R.I. Smith, G.J. Konzek, W.E. Kennedy, Jr., *Technology, Safety and Costs of Decommissioning A Reference Pressurized Water Reactor Power Station*, NUREG/CR-0130, Vol. 1 (Washington, D.C.: U.S. Nuclear Regulatory Commission, June 1978), Table 2.9-3.

H.D. Oak, G.M. Holter, W.E. Kennedy, Jr., G.J. Konzek, *Technology, Safety, and Costs of Decommissioning A Reference Boiling Water Reactor Power Station*, NUREG/CR-0672, Vol. 1, (Washington, D.C.: U.S. Nuclear Regulatory Commission, June 1980), Table 2.10-4.

Table 6.  
**Ranges of Decommissioning Costs for Four Studies  
 Using Immediate Dismantlement (In Million \$)**

Study	Unit Type			
	PWR		BWR	
	Original Cost (Year \$)	Cost in 1983 Dollars	Original Cost (Year \$)	Cost in 1983 Dollars
Battelle (NRC) <sup>b</sup>	42.1 (1978)	61.5	43.6 (1978)	63.7
Atomic Industrial Forum <sup>c</sup>	23.7-101.9 (1980)	30.1-129.3	29.4-121.8 (1980)	37.3-154.6
Analysis & Inference, Inc. (NRC) <sup>d</sup>	152.4-609.6 (1981)	173.7-694.9	----	----
Chapman <sup>e</sup>	100% of investment cost (1979)	up to 3,000	----	----

TABLE 6. Footnotes:

\*PWR=Pressurized Water Reactor; BWR=Boiling Water Reactor. Studies, with the exception of AIF, list costs for large reactors (900-1175 MWE). Values have been updated to 1983 dollars using "Handy-Whitman Public Utility Index for Electric Light and Power," Dept. of Commerce, Bureau of Industry Economics, *Construction Review*, Sept.-Oct. 1983, November 1978. The index used for 1983 is based on preliminary data.

<sup>b</sup>Battelle's figures include a 25 percent contingency factor. Values exclude maintenance surveillance and security costs. The study looked at costs for a reference PWR and BWR.

<sup>c</sup>AIF's ranges include costs of small, medium, and large reactors. Figures exclude escalation, contingency, maintenance, surveillance and security costs. Estimates are based on engineering studies carried out for a variety of units.

<sup>d</sup>Analysis and Inference used Battelle's original cost estimates as a base. 1981 costs were assumed to be 32% greater than 1978 costs. Handy-Whitman regional cost indices for nuclear production plant were 29.7 percent to 34.6 percent higher in March, 1981, than for January, 1978.

<sup>e</sup>In 1980, Chapman estimated that in a severe accident scenario (hypothetical Three Mile Island) decommissioning costs for a large reactor could be 100 percent of the investment cost. More recently, however, he has estimated that decommissioning costs in 1983 would be as high as \$3 billion for complete dismantling a healthy reactor with a 30 year operating life, although no formal analysis has been performed.

Sources: D.F. Greenwood, R.K. Westfahl, and J.W. Rymsha, "Analysis of Decommissioning Costs for Nuclear Power Reactors," (Boston, MA: Stone and Webster Engr. Corp., 1983), Table 3 and 6. Study performed for the Atomic Industrial Forum.

P.L. Chernick, W.B. Farley, M.B. Meyer, L.C. Scharff, *Design, Costs, and Acceptability of an Electric Utility Self-Insurance Pool for Assuring the Adequacy of Funds for Nuclear Power Plant Decommissioning Expense*, NUREG/CR-2370, (Washington, D.C.: U.S. Nuclear Regulatory Commission 1981), Table B-12.

Duane Chapman, *Nuclear Economics: Taxation, Fuel Cost and Decommissioning* (Sacramento, CA: California Energy Commission, 1980), Table 14.

Duane Chapman, Cornell University, Ithaca, N.Y., Personal Communication, May 13, 1984.

R.I. Smith, G.J. Konzek, W.E. Kennedy, Jr., *Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station*, NUREG/CR-0130, Vol. 1, (Washington, D.C.: Nuclear Regulatory Commission, June 1978), Table 2.9-3.

H.D. Oak, G.M. Holter, W.E. Kennedy, Jr., G.J. Konzek, *Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station*, NUREG/CR-0672, Vol. 1, (Washington, D.C.: U.S. Nuclear Regulatory Commission, June 1980), Table 2-10.4.

Table 7.  
Cost Overruns in Major Construction Projects Completed Between 1956-1977

Project	Initial Estimate		Actual Result		Unadjusted Ratio of Final to Initial Cost	Ratio After Adjustment		Compound Annual Rate of Cost Overruns, After Adjustments (in percent) <sup>a</sup>
	Amount (millions)	Date	Amount (millions)	Date Completed		For Unanticipated Inflation	For Change in Scope of Project	
Bay Area Rapid Transit Authority	\$996.0	1962	\$1640.0	5/76	1.647	1.297	1.037	0.31
New Orleans Superdome	46.0	1967	178.0	7/75	3.870	3.219	3.219	15.73
Toledo Edison's Davis-Besse nuclear power plant, Ohio	305.7	1971	466.0	5/75	1.524	1.401	1.401	11.89
Trans-Alaska Oil Pipeline (Alyeska)	900.0 <sup>b</sup>	1970	7700.0 <sup>c</sup>	7/77	8.556 <sup>c</sup>	6.926	4.250	22.96
Cooper Nuclear Station, Nebr. Pub. Power Dist.	184.0	1966	395.3	74	2.148	1.748	1.748	7.23
Rancho Seco Nuclear Unit No. 1, Sacramento	142.5	1967	347.0	74	2.435	2.026 <sup>d</sup>	1.239	3.11
Dulles Airport, Washington, D.C.	66.0 <sup>c</sup>	1959	108.3 <sup>c</sup>	62	1.641 <sup>c</sup>	1.641 <sup>d</sup>	1.486	14.10
Second Chesapeake Bay Bridge	96.6 <sup>c</sup>	1968	120.1 <sup>c</sup>	6/73	1.243 <sup>c</sup>	1.104	1.104	2.00
Frying Pan Arkansas Project								
Ruedi Dam	12.8 <sup>c</sup>	1962	22.9	72	1.789 <sup>c</sup>	1.636	1.145	1.36
Sugar Loaf	6.1	1962	10.2	73	1.672 <sup>c</sup>	1.500	1.500	3.75
Boustead Tunnel	9.2 <sup>c</sup>	1962	21.2 <sup>c</sup>	73	2.304 <sup>c</sup>	2.078	1.233	1.92
Rayburn Office Building, Washington, D.C.	64.0 <sup>c</sup>	1956	98.0 <sup>c</sup>	6/66	1.531 <sup>c</sup>	1.531 <sup>d</sup>	1.342	2.99
Weighted average					3.93	3.21	2.21	10.07

TABLE 7 Footnotes

<sup>a</sup>The compound annual rate expression is used only as a convenient method of comparing initial cost estimates with the sum of all actual costs at the termination of the project. This device permits a comparison of overruns on several projects having different construction periods.

<sup>b</sup>In May 1974, the Alyeska Pipeline Service Co. reestimated capital cost at \$4 billion, then in October 1974 costs were again estimated at \$6 billion for the complete pipeline. By June 1975, the estimate was raised to \$8.375 billion. In 1969, the \$900 million cost estimate for Alyeska assumed a capacity of 500 mb/d. The scope was changed to permit a capacity of 1.2 million b/d. The cost of this change in scope was \$700 million, raising the initial capital cost estimate to \$1.6 billion.

<sup>c</sup>Does not include interest.

<sup>d</sup>Observed inflation was less than anticipated.

Source

Walter J. Mead, George W. Rogers and Rufus Z. Smith, *Transporting Natural Gas From the Arctic*. (Washington D.C., Institute for Public Policy Research, 1977): 88-89 Cited in Edward Merrow, Stephen W. Chapel or Christopher Worthing, *A Review of Cost Estimation in New Technologies: Implications for Energy Process Plans* Santa Monica, Rand Corporation, July 1979): 38

Table 8.  
**Generating Lives of Inoperable Nuclear Commercial Power Generating Reactors 1985**

Reactor	Number of Years Operated (b)	Number of Years Closed Prematurely (c)
Humboldt Bay 3	13	17
Dresden 1	18	12 (d)
Indian Point 1	12	18
Three Mile Island 1	5	25
Three Mile Island 2	1	29
Shippingport	25	5 (e)
Average	12	18

TABLE 8. Footnotes

<sup>a</sup>Inoperable reactors are defined as units shut down for over 1 year with major problems hindering their future operation, or those which have been permanently shut down. Inoperable reactors deemed "commercial experimental" are: Fermi 1, Pathfinder, Peach Bottom 1, Bonus, Piqua, CVTR, Elk River, and Haldam. This distinction is important because putting these plants in a category with other commercial inoperable reactors lowers the average number of years operated to eight, and raises the average number of years plants closed prematurely to 19.5.

<sup>b</sup>This is measured from the time the plant went into commercial operation.

<sup>c</sup>Figures assume a 30 year operating life for a typical reactor.

<sup>d</sup>Commonwealth Edison made its decision not to restart the unit in Fall 1984.

<sup>e</sup>This reactor was not judged according to whether it lived out a 30-year life. Its function did not necessitate a 30 or more year operating life, as does operation of today's commercial reactors.

<sup>f</sup>No final decision has been made as to whether this plant will be decommissioned or restarted.

Source: U.S. Nuclear Regulatory Commission, Licensed Operating Reactors-Status Summary Report, NUREG-0020, Vol. 8, No. 3 (Washington, D.C.: U.S. NRC, March 1984), p. 3-6.

Decommissioning Funding Data for Inoperable Commercial Power Generating Reactors 1984

Unit	Estimated Cost of De-commissioning (Millions of 1983 dollars)	Funds Collected From Ratepayers Prior to Shutdown (Millions of 1983 dollars)	Number of Years Commercial Operation before First Funds Collected	Number of Years Funds Collected Prior to Unit Shutdown
Humboldt Bay 3	62.0 <sup>d</sup>	.517	9	4
Dresden 1	95.0 <sup>e</sup>	----	Unit operated for 18 years. A separate subaccount for de-commissioning was established 2 years after plant shutdown. <sup>h</sup>	----
Indian Pt. 1	116.3 <sup>f</sup>	No funds collected	Plant operated for 12 years with no funds collected.	0
Three Mile Island 1	37.7	----	4	1
Three Mile Island 2 <sup>b</sup>	1000.0 <sup>g</sup>	No funds collected	No funds collected	0
Shippingport <sup>c</sup>	79.7	N/A	N/A	N/A

TABLE 9. Footnotes

<sup>a</sup>Inoperable reactors are defined as units shut down for over one year with major problems hindering their future operation, or those which have been permanently shut down. This table does not include data for the following inoperable commercial experimental reactors: Pathfinder, Fermi 1, Peach Bottom 1, Hallam, Piqua, CVTR, Elk River, or Bonus.

(-) indicates this information was not available.

<sup>b</sup>Unit 2 operated for only four months prior to the accident. The utility has not yet determined what the costs of decommissioning the reactor will be.

<sup>c</sup>Shippingport is owned by the U.S. Department of Energy. Decommissioning costs will be paid by the DOE. No funds for decommissioning were, therefore, collected from ratepayers during the plant's operating life.

<sup>d</sup>This figure does not include maintenance and surveillance costs for the plant, \$600 million per year.

<sup>e</sup>This includes both the cost of chemical decontamination of the plant, \$57 million (\$8.250 million of which will be paid by the DOE), and the estimated cost of decommissioning, \$38 million.

<sup>f</sup>This represents total estimated decommissioning costs for Indian Point 1 & 2.

<sup>g</sup>Since 1980, General Public Utilities has estimated the cost of the clean-up at Three Mile Island, Unit 2 at approx. \$1 billion. A 1980 General Accounting Office study assumed that these costs included restart. However, information presented in 1983 hearings before the Subcommittee on Energy and the Environment, U.S. House of Representatives did not list restart or decommissioning as part of clean-up costs.

<sup>h</sup>The establishment of a separate decommissioning subaccount marked the first time these costs were deemed greater than those for a non-nuclear generating unit.

Sources: "Current Status of the Three Mile Island Nuclear Generating Station, Units 1 & 2," Oversight Hearing before the Subcommittee on Energy and the Environment of the Committee on Interior and Insular Affairs House of Representatives, April 26, 1983.

U.S. General Accounting Office, *Report to the Congress of the United States "Greater Commitment Needed to Solve Continuing Problems at Three Mile Island,"* EMD61106, (Washington, D.C.: U.S. General Accounting Office, August 26, 1981).

U.S. Nuclear Regulatory Commission, *Licensed Operating Reactor Status Summary Report*, NUREG0020, Vol. 7, No. 12, (Washington, D.C.: Dec. 1983), p. 34.

Personal communication, Pat Agrella, Redwood Alliance, Arcata, CA, May 2, 1984.

Personal communication, Richard Marshall, New York State Public Service Commission, Albany, NY, April 13, 1984.

Personal communication, Robert Roenthal, Pennsylvania Public Utilities Commission, Harrisburg, PA, April 12, 1984.

Personal communication, James Tascia, Commonwealth Edison Co., Chicago, IL, October 31, 1983.

Personal Communication, Jane Whitcher, Business and Professional People in Public Interest, Chicago, IL, May 2, 1984.

**Table 10.**  
**Decommissioning Studies Used in Cost Estimate Formulation**

Unit, (State)	Basis for Cost Estimate Formulation
Ferley 1,2 (AL)	Bechtel Corp. Engr. Study, updated July 1981.
Diablo Canyon (CA)	N.U.S. Corp. study 1979.
Rancho Seco (CA)	In-house study 1981.
Millstone 1,2; Conn. Yankee (CT)	In-house study based on Battelle study and extrapolation from other studies.
Crystal River (FL)	N.U.S. Corp. engr. study 1982.
Dresden 1,2,3; Zion 1,2; Quad Cities 1,2; La Salle 1 (IL)	10% of the cost of plant construction in depreciation rate for nuclear plant. Assumptions from Battelle, AEP/NESP studies and others.
Duane Arnold (IA)	No specific studies.
Grand Gulf 1 (MS)	Outside consultant study. Used Battelle study and other studies as a basis.
Pt. Calhoun (NE)	Pickard, Lowe and Garrett did estimates but no detailed plans.
Cooper (NE)	In-house study 1983. Used other studies, such as that done for Pt. Calhoun.
Indian Point 3; James A. Fitzpatrick (NY)	National Environmental Studies Project reports sponsored by the Atomic Industrial Forum, Inc.
Oyster Creek (NJ)	In-house study carried out by parent company General Public Utilities. CPU study modified version of study done previously by Pacific Gas and Electric Co. for Diablo Canyon.
Pilgrim (MA)	William J. Manion, N.E.S. Inc., engr. study - 1983. Site specific study based on Atomic Industrial Forum decommissioning study.
Brunswick 1,2 (NC)	N.E.S. Inc., engr. study. Last time updated 1981.
Trojan (OR)	In-house study 1979 based on Battelle study and one other site specific study.
McQuire 1,2; Oconee 1,2,3, (SC)	Depreciation rate of 4% for nuclear plant includes 10% provision for decommissioning. <sup>a</sup>
Summer 1 (SC)	Thomas LaGuardia - engr. study 1982.
Vermont Yankee (VT)	Outside Consultant - engr. study.
Surry 1,2; North Anna 1,2 (VA)	TLO Engineering, site specific study.
Point Beach 1,2 (WI)	In-house study using other studies as a basis - 1983.
LaCrosse (WI)	No complete engineering study. <sup>b</sup>

TABLE 10. Footnotes:

<sup>a</sup>According to William Stwart, Vice Pres. of Regulatory Affairs, Duke Power Co. "Four percent is regulatorily acceptable. CP&L and Conoco. Ed both got four percent ... seemed to be as good a guess as any ... Anybody doing anything else, it's just a fiction ... We know what it's going to cost." - Personal Communication, William Stwart, October 23, 1983

<sup>b</sup>According to Richard E. Shimshak, Manager Special Nuclear Projects, Oakryland Power Corp. "The twenty million dollar estimate is just a hunch back call ... the Assistant General Manager pulled it out of the wall." - Personal Communication, Richard E. Shimshak, October 24, 1983

**Total U.S. Utility Estimated Decommissioning Costs 1983  
Versus Alternative Cost Scenarios (In Billion \$)**

Source	Basis 1983	Decommissioning Cost Estimated by Operating Utility	Potential U.S. Cost Deficit (-) or Surplus (+)
Public Citizen Survey Results	84 Reactor's Costs	5.6	----
Battelle (1978) <sup>b</sup>	61.3/unit	5.2	+ .42
Atomic Industrial Forum (1982) <sup>c</sup>			
Average	69.2/unit	5.9	-.25
High	129.3/unit	11.0	-5.4
Rand Corp. (1979) <sup>d</sup>	400% Amount Originally Estimated	22.5	-16.9
Analysis and Inference (1981) <sup>e</sup>			
Average	405.4/unit	34.5	-28.8
High	694.9/unit	59.1	-53.4
Chapman (1980) <sup>f</sup>	3,000/unit	255.0	-249.4

TABLE 11. Footnotes:

<sup>a</sup>Eighty-four units have been included in this table. Three reactors have been excluded, Three Mile Island 2, Hanford-N and Shippingport. Costs of decommissioning these units are unavailable. (—) indicates a response here is not appropriate.

Conversions to 1983 dollars were made using "Handy-Whitman Public Utility Index for Electric Light and Power," Dept. of Commerce, Bureau of Industrial Economics, Construction Review, Sept.-Oct. 1983 and November 1978. A description of how this index was chosen can be found in Table 9 of this report.

Table 4 lists reactor specific data and provides details related to operating license expiration dates and cost estimate development for each unit. Estimates, other than those using the Rand Corp. study, use costs for pressurized water reactors (PWR) since over 60 percent of today's licensed commercial reactors are this type and costs of decommissioning a PWR are estimated to be lower than those for a boiling water reactor. The immediate dismantlement (DECOM) option is assumed since over 60 percent of today's reactors are tentatively scheduled for prompt dismantlement following shutdown.

<sup>b</sup>The Battelle PWR reactor study for the Nuclear Regulatory Commission (NRC) establishes the estimated cost of decommissioning a reference 1050 MWE reactor using immediate dismantlement. The cost estimate is \$42.1 million (\$1978).

<sup>c</sup>The Stone and Webster Engineering Corp. study for the Atomic Industrial Forum established a low, average and high cost estimate for dismantling a PWR based on estimates for a number of reactors of varying sizes. Although the study was completed in 1981, a follow-up study was carried out in 1982 up-dating cost estimates. Average and high figures are included in this table since the low range figures cited in the study were cost estimates for a small reactor. Values were \$65.3 and \$122.0 million in 1982, respectively.

<sup>d</sup>Rand Corp. found in a study of cost estimation in untried technologies that cost overruns averaged 400 percent. Rand looked at a sample of projects carried out between 1956-1977. Table 5 of the report lists these projects.

<sup>e</sup>Analysis and Inference, Inc. established cost estimates as part of a decommissioning insurance study for the NRC. The consultants established figures for four ratios of actual to estimated costs dismantling small, medium and large PWRs. An average for these four as well as the high figures for large reactors are presented here. In 1981, these values were \$355.6 and \$609.6 million, respectively.

<sup>f</sup>In a 1980 study for the California Energy Commission, Prof. Duane Chapman estimated the cost of decommissioning a large reactor with serious decontamination problems following an accident as 100 percent of the investment cost. In a May 1984 interview, Chapman estimated that the cost to fully dismantle a healthy reactor of this size operating for 30 years in 1983 would be in the \$3 billion range.

- Sources:
- Duane Chapman, *Nuclear Economics: Taxation, Fuel Cost, and Decommissioning*, (Sacramento, CA: California Energy Commission, 1980):54-56, Table 14.
  - P.Z. Chermek, W.B. Fairley, M.B. Meyer, L.C. Schmitt, *Design, Costs and Acceptability of an Electric Utility Self-Insurance Pool for Assuring the Adequacy of Funds for Nuclear Power Plant Decommissioning Expense*, NUREG/CR-2370, (Washington, D.C.: U.S. Nuclear Regulatory Commission, 1981): 122, Table B-12.
  - D.F. Greenwood, R.K. Westfall and J.W. Rymasz, *Analysis of Decommissioning Costs for Nuclear Power Reactors*, (Boston, MA: Stone and Webster Engineering Corp., 1982): 9, Table 3.
  - Edward W. Merrow, Stephen W. Chapel, and Christopher Worthing, *A Review of Cost Estimation in New Technologies*, (Santa Monica, CA: The Rand Corporation, 1979): 33, Table 3.6.
  - R.L. Smith, G.J. Konark, and W.E. Kennedy, Jr., *Technology Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station*, NUREG/CR-0130, Vol. 1, (Washington, D.C.: U.S. Nuclear Regulatory Commission, 1978): 2-11, Table 2.9-1.
  - Robert D. Hershey, Jr., "Bills Seek to Clarify Tax Status of Nuclear Shutdown Costs," *The New York Times*, April 26, 1984, p D4.
  - Personal Communication, Prof. Duane Chapman, Cornell University, Ithaca, NY, May 13, 1984.

Table 12.  
Decommissioning Cost Estimates by State 1983  
Versus High and Low Estimates of Potential Costs (In Billion \$)

State	Number of Units	Average Year of Operating License Expiration <sup>b</sup>	Total Decommissioning Cost, Utility Estimates	Total Decommissioning Cost, Battelle (NRC) Estimates	Deficit (-) or Surplus (+) if Battelle Estimate Is Correct	Total Decommissioning Cost, Chapman Estimates	Deficit (-) or Surplus (+) if Chapman Estimate Is Correct
AL	5	2011	.265	.307	-51.1	15.0	-14.7
AR	2	2010	.083	.123	-47.6	6.0	-5.9
CA	6	2006	.628	.368	+250.8	18.0	-17.4
CO	1	2008	.040	.061	-21.4	3.0	-3.0
CT	3	2007	.323	.184	+139.4	9.0	-8.7
FL	5	2011	.384	.307	+77.9	15.0	-14.6
GA	2	2016	.133	.123	+10.6	6.0	-5.9
IL	8	2007	.473 <sup>f</sup>	.490	-17.2	24.0	-23.5
IA	1	2010	None	.061	-61.3	3.0	-3.0
ME	1	2008	.122	.061	+60.7	3.0	-2.9
MD	2	2009	.094	.123	-29.6	6.0	-5.9
MA	2	2003	.127	.123	-4.7	6.0	-5.9
MI	4	2006	.290	.245	+44.8	12.0	-11.7
KN	3	2004	.164	.184	-20.4	9.0	-8.8
MS	1	2014	.107	.061	+45.3	3.0	-2.9
NB	2	2008	.177	.123	+54.4	6.0	-5.8
NJ	3	2006	.295	.184	+110.9	9.0	-8.7
NY	6	2002	.336	.368	-31.4	18.0	-17.7
NC	4	2010	.263	.245	+17.9	12.0	-11.7
OH	1	2011	.053	.061	-8.3	3.0	-2.9
OR	1	2011	.034	.061	-27.5	3.0	-3.0
PA	7	2006	.356 <sup>g</sup>	.307	+49.8	15.0	-14.6
SC	5	2008	.325	.307	+18.9	15.0	-14.7
TN	2	2013	.102	.123	-20.6	6.0	-5.9
VT	1	2007	.083	.061	+21.6	3.0	-2.9
VA	4	2010	.231	.245	-14.4	12.0	-11.8
WA	1	---	---	---	---	---	---
WI	4	2007 <sup>e</sup>	.171	.245	-73.9	12.0	-11.8
<b>Total</b>	<b>84</b>		<b>5.6</b>	<b>5.2</b>	<b>+4.2</b>	<b>255.0</b>	<b>-249.4</b>

TABLE 12. Footnotes

<sup>a</sup>Figures in this table represent low-end and high-end estimates of the cost of decommissioning found in studies updated to 1983 dollars. Low-end values are from the Battelle Pressurized Water Reactor study for the NRC (\$1978, updated to \$1983).

<sup>b</sup>Values representing the high-end of the potential cost spectrum were taken from a study by Prof. Duane Chapman for California Energy Commission (1980). Chapman estimated the cost of decommissioning a large (1000 MWe) reactor with serious contamination problems following an accident as 100 percent of the investment cost. However, in a November 1984 interview, Prof. Chapman estimated that in 1983 dismantlement costs for a healthy reactor this size operating for 30 years would be in the \$3 billion range, assuming that the reactor is completely dismantled.

<sup>c</sup>Ranges are based on cost estimates for pressurized water reactors since over 60 percent of today's reactors are tentatively scheduled for prompt dismantlement following shutdown. Estimates are conservative as they are based on costs for medium and small units and over 60 percent of licensed reactors are large (800-1000 MWe) units.

<sup>d</sup>2010 was used as a base year for looking at future costs since over 85 percent of today's licensed reactors are expected to be inoperable by this time.

<sup>e</sup>Conversions to 1983 dollars were made using "Handy-Whitman Public Utility Index for Electric Light and Power," Dept. of Commerce, Bureau of Industrial Economics, Construction Review, Sept.-Oct. 1983 and Nov. 1978. A description of how this index was chosen can be found in Table 4 of this report.

<sup>f</sup>Table 4 lists reactor specific data and provides details related to operating license expiration dates and cost estimate development for each unit.

<sup>g</sup>Of the 87 licensed commercial units around the country, 84 are included in this table. Shippingport (PA) and Hanford-N (WA) are excluded since they are Department of Energy reactors and costs will be paid by the federal government. Three Mile Island Unit 2 (PA) is excluded since decommissioning cost estimates are unavailable. However, in 1980 General Public Utilities, the owner of the unit, estimated that the total cost of the clean-up would be approximately \$1 billion. In 1984 the company continued to name \$1 billion as the estimated clean-up cost.

<sup>h</sup>This presentation may oversimplify what actual costs will be by uniformly estimating costs per reactor, ignoring factors such as reactor size and type, cost estimation adjustment, changes in technology and other variables. The table does not attempt to portray exact costs, but is intended to suggest conservatively the potential cost deficits with cost estimates currently in use.

<sup>i</sup>Permanently inoperable reactors were assigned the year of shutdowns as the license expiration date. The original license expiration date was used for reactors shutdown but for which no decision has been made toward restart or decommissioning.

<sup>j</sup>Cost estimates are those used by utilities for rate-making purposes for each unit totaled by state. Figures were all converted to 1983 dollars using the Handy-Whitman Index.

<sup>k</sup>As of June 1984, Diablo Canyon had not yet received an operating license. In order to include the reactor in average operating license expiration date figures, a 35 year operating life was assumed from 1984.

<sup>l</sup>Dresden 2 (IL), Oyster Creek (NJ), and La Crosse (WI) never received commercial operating licenses. These plants operate with provisional licenses. In order to include these reactors in average operating license expiration date figures, a 35 year operating license was assumed from the year they began commercial operation.

<sup>m</sup>Costs of decontaminating Dresden 1, estimated in 1984 to be approximately \$42 million (Commonwealth Edison's share of the total cost) have not been included in this figure.

<sup>n</sup>The estimated cost of decommissioning the Susquehanna 1 reactor provided by the utility includes costs for Susquehanna 2 (currently under construction). In order to attempt to separate costs for Unit 1, the total figure of \$229 million was halved in this table.

Sources: D.F. Greenwood, R.K. Westfall, and J.W. Rymaha, *Analysis of Decommissioning Costs for Nuclear Power Reactors*, (Boston, MA: Stone and Webster Eng. Corp., 1982); 9, Table 3; Duane Chapman, *Nuclear Economics: Taxation, Fuel Cost and Decommissioning*, (Sacramento, CA: California Energy Commission, 1980); 54-56, Table 14; Robert D. Marshall, *Electricity Costs: A Study of the Impact of Fuel and Capital Costs*, (Washington, D.C.: American Nuclear Society, 1984); 10, Table 1.

## Chapter Four

### Phantom Funding: The Latest Utility Gold Mine

*Despite its apparent popularity, it is so fraught with uncertainty as to be of marginal adequacy unless coupled with insurance, or other surety arrangements, state certification, or some other mechanism to increase the assurance provided.(1)*

Robert Wood, "Assuring the Availability of Funds for Decommissioning Nuclear Facilities," NUREG-0584

Who will ultimately pay for cleaning up and dismantling the nation's nuclear generating plants? Will utility funds be available for the job? Can utilities be held legally liable? Will the government have to step in?

These questions are of more than academic interest. In 1978, in the Love Canal neighborhood of Niagara Falls, N.Y., a group of homeowners were shocked to discover that their yards, basements, and elementary school were all contaminated with hazardous chemical wastes, originally dumped in the area by the Hooker Chemical Co. Yet Hooker Chemical's legal liability for the problem was questionable, if not non-existent, because the company had deeded its old dump site to the city of Niagara Falls. By 1982, in response to lawsuits brought by Love Canal residents, various levels of government had extended more than \$60 million in subsidies to pay for a cleanup effort that may eventually cost billions of dollars to society. (2)

Similarly, following the accident at Three Mile Island, the Metropolitan Edison Co. looked to the federal government, the states and other utilities to help in paying for what may be a billion dollars worth of cleanup costs connected with TMI. (3)

Such examples suggest that the burden of financing nuclear decommissioning could also fall on taxpayers, if utility financing is not firmly secured in advance. The NRC has recognized the link between adequate financing and public health and safety. According to the Commission: "The availability of adequate funds helps ensure that decommissioning can be accomplished in a safe and timely manner and that lack of funds does not result in delays in decommissioning that may cause potential public health and safety problems." (4)

Unfortunately, our research has shown that, as of 1984, 64 percent of the reactors licensed to operate in the U.S. are covered by a decommissioning financing method which the NRC itself terms "so fraught with uncertainty as to be of marginal adequacy unless coupled with some form of insurance or other surety arrangements." (5) Some reactors,

meanwhile, are not yet covered by decommissioning funds at all.

There is also more fundamental cause for concern regarding utilities' financing of future decommissioning: the restructuring of utilities through the creation of "holding companies." Such restructuring allows utilities to diversify into new ventures outside the scope of federal and state regulation. This could represent a threat to availability of funds for decommissioning and could undermine the ability to hold utilities legally accountable for decommissioning.

#### Decommissioning Financing: What are the Options?

**Internal Unsegregated Funds.** The most popular financing method for decommissioning does not actually require funds to be set aside. Instead, this method—internal unsegregated funding—allows utilities to use decommissioning money as an "internal" source of capital to invest in new assets. The funds collected from ratepayers are accumulated on the utility's books as "negative net salvage value," i.e., the asset is not only depreciating in value, but is also accumulating debt. When it is time to decommission the reactor, the utility has to issue bonds backed by their assets in order to provide the necessary financing. This approach is best characterized as "phantom funding," since the funds disappear after they have been collected.

A letter from the Michigan Public Service Commission to the NRC confirms this function of internal unsegregated funding: "This method has the advantage of providing an increasing cash flow to the utilities . . . for the funding of current construction programs." (6)

**Prepayment.** In sharp contrast to phantom funding, "prepayment" requires utilities to raise sufficient funds to finance decommissioning before the startup of any given reactor. The utility can then amortize the prepayment costs over the plant's operating life, so that the cost can be recovered through rates.

**External Sinking Funding.** External sinking funds for decommissioning are collected from ratepayers over the life of the plant and kept separate from the utility's assets. Such funds are managed by an outside trustee such as a bank or by the government and invested in tax-free state or municipal bonds or in other non-utility assets.

**Internal Segregated Funding.** As with external sinking funds, the funds collected from ratepayers are placed in a fund that is kept separate from the company's assets; however, in this case the fund is under the utility's control.

D.3.2.1.1  
(a)

D.8.2.1

D.3.2.1.1  
(a)

D.8.1

D.3.2.1.1  
(a)

In addition to these funding methods which can be used for individual reactors, pooled funding alternatives have been considered for use in decommissioning.(7) These include decommissioning insurance and surety bonding. Such pooled funding mechanisms would allow nuclear utilities to act as a group, establishing a decommissioning financing system. They have also been considered for use in cases of premature reactor shutdown or nuclear accidents that put reactors out of operation.

**Surety Bonds.** The purchase of surety bonds would guarantee that funds equal to the value of the bond would be available to pay for decommissioning if the utility defaults in providing financing through the financing mechanism selected for the individual plant. The idea of requiring utilities to purchase surety bonds to cover the costs of decommissioning was specifically raised in the 1977 public interest petition to the NRC. (8) Subsequently, the NRC surveyed the ten largest surety bonding companies in the U.S. on the feasibility of this concept. The companies responded that they would not issue surety bonds for the 40-year time periods involved, nor for the large amounts of money required. For this and other reasons, the NRC has dismissed surety bonding as a feasible method of funding future decommissioning efforts. (9)

**Nuclear Decommissioning Insurance.** The NRC has examined the possibility of utilities creating a self-insurance pool in order to assure funds for decommissioning. In 1981, the NRC hired the consulting firm of Analysis and Inference, Inc. to study this option. They concluded that insurance is an acceptable option, providing a fairly high degree of assurance that funds would be available when needed; but that it is more acceptable for accident-related coverage than for routine decommissioning.(10)

D.3.2.2.1 The insurance industry appeared responsive to this option initially when approached by utilities; but their attention soon focused on insuring the cost of decontaminating reactors following an accident. (11) In fact, to the extent that decommissioning is a routine occurrence scheduled for the end of a nuclear plant's operating life, it is not in the traditional sense an 'insurable event' where risk-sharing makes sense. Nevertheless, Robert Wood, author of the NRC report laying out the decommissioning options, suggests that citizen groups and legislators may want to explore decommissioning insurance further. Insurance to cover premature shutdown, where sufficient decommissioning funds would not have been collected, or an accident requiring decommissioning merits serious consideration.

#### Existing Utility Decommissioning Funds

Prior to the accident at Three Mile Island, most utilities did not separate decommissioning monies for accounting purposes, instead treating reactors as they would their non-nuclear steam generating units. Table 13 shows the number of years units operated before utilities began collecting decommissioning funds. Eleven units operated for as long as 10 years without having any funds set aside and 18 units operated for at least five years before funds were collected.

Our 1984 survey of utility decommissioning financing methods, as of the end of 1983, shows a clear preference for

internal unsegregated "phantom" funds. No utility was using prepayment—the most reliable method of financing decommissioning. Overall, the survey shows that the less desirable a financing method is in terms of assuring the fair treatment of customers and the future financial integrity of decommissioning, the more likely it is to be used by the utilities.

Table 14 summarizes the financing methods for the 87 nuclear units included in the survey. The table is based on individual plant data found in Table 4.

Internal unsegregated funds were being used for 55 units in 17 states—63 percent of all units. A number of publicly-controlled utilities and several private companies are using segregated internal funding for 14 units in six states—16 percent of all units.

External sinking funding was being used for 10 units in 4 states—Maine, Massachusetts, Pennsylvania and Colorado. In Vermont, California, Mississippi and New Hampshire policies had been adopted to require external funds, but the funds were not yet in place. In Vermont and Mississippi, the determination was made by the Federal Energy Regulatory Commission for Vermont Yankee and Grand Gulf.

There were no decommissioning financing provisions in place for five units—Duane Arnold in Iowa, Donald C. Cook 1 & 2 in Michigan, Cooper in Nebraska and LaCrosse in Wisconsin. Nor have decommissioning funds been set aside for the DOE's Shippingport and Hanford-N reactors, so that Congressional appropriations will be required.

Table 15 shows the decommissioning funds collected by the end of 1983 by the primary owners of 87 operating and non-operating licensed commercial nuclear reactors in the United States. Of the more than \$618 million collected from utility ratepayers to cover future decommissioning expenses, just 3% was set aside in external sinking funds and 13% was collected in internal segregated funds. Together, such internal and external segregated funds total \$101.7 million, or 16% of the total funds collected so far.

Internal unsegregated funds accounted for the remaining \$517 million. That puts 84% of the total decommissioning funds collected in this country in "phantom funds" which utilities may use for new investment projects, with no need to insure that the money taken from customers will be available in the future for decommissioning.

On a state-by-state basis, Illinois had the largest quantity of "phantom decommissioning funds" collected from utility ratepayers—more than \$84 million at the end of 1983. This figure probably represents the heavy dependence of Illinois utilities on nuclear power: so far, the state has eight licensed nuclear plants and another four units under construction. Other states with impressive totals of "phantom funding" include New York, with \$79.8 million accumulated, and Wisconsin, with \$61 million set aside in internal unsegregated funds.

Ironically, the results of our decommissioning survey suggest that some utilities with internal unsegregated funds may be raising their decommissioning cost estimates in order to increase their cash flow. In Wisconsin, for example, recent developments in the state regulatory climate have apparently encouraged the Wisconsin Electric Power Co. to use very high cost estimates for decommissioning. (12) In 1983, the utility

D.3.2.1.2

D.3.2.1.2

D.3.2.1.2

increased its cost estimates for the decommissioning of the Point Beach No. 1 and 2 by a factor of seven and is now collecting \$27 million per year for decommissioning.

Detailed Assessment of Financing Methods

The NRC is obliged to assure that "decommissioning is carried out so as to protect public health and safety." (13) Which financing method should they choose?

In developing its proposed rule on decommissioning, released on February 11, 1985, the NRC was to examine "the extent to which the Commission's regulations and policies assure that adequate funds will be available to decommission a nuclear facility after its operating life has ended." (14)

Six major criteria were identified by the NRC for evaluating the "plant-specific" financing options: (i) assurance of future availability of funds, (ii) cost, (iii) equity to ratepayers, (iv) administrative impacts, (v) responsiveness of different mechanisms to change, and (vi) adaptability to multiple ownership and multiple jurisdictions affecting a single reactor. (15) The first three criteria are most likely to affect the ultimate safety of the decommissioning method chosen and the fairness of cost allocation to ratepayers. They are discussed in detail below.

**Assurance of Fund Availability.** The NRC has rated decommissioning financing methods according to the "assurance" they provide that sufficient funds will actually be available for decommissioning. The Commission found prepayment to be far the most preferable method. (16) This finding was based on the assumption that the utility's initial cost estimates are correct—an assumption which is unlikely to describe the real world. However, even if such original cost estimates are not accurate, prepayment will provide considerable assurance, since additional prepayment of funds by the utility can be mandated when new expenses are identified. A study done for the NRC by Temple, Barker and Sloane has concurred with this finding on the superiority of prepayment for assurance purposes. (17)

D.3.2.2.1

External sinking funding provides the next highest level of "assurance," according to the NRC study. The NRC found that external sinking funds would probably not be vulnerable in the event of utility bankruptcy—a danger now threatening some utilities. However, external sinking funds, unlike prepayment of decommissioning costs, were found to be vulnerable to the possibility of an unexpected reactor decommissioning caused by an accident. (18)

The NRC ranked internal segregated funding next. It was considered unlikely to provide assurance in the case of a deterioration in the utility's financial condition, particularly because such funds might be made available to creditors in the event of a utility bankruptcy. (19)

D.3.2.1.1 (a)

Finally, the NRC found internal unsegregated funding to provide the least assurance that decommissioning funds will be available as needed in the future. (20) Wood notes: "Despite its apparent popularity, it is so fraught with uncertainty as to be of marginal adequacy unless coupled with insurance, or other surety arrangements, state certification, or some other mechanism to increase the assurance provided." (21) The NRC has also found internal unsegregated funding to be

vulnerable to any circumstance which threatens the financial health of a utility. They state: "A bankrupt or seriously troubled utility would have trouble in raising capital against its decommissioning reserve." (22)

D.3.2.1.1 (a)

**Costs of Different Funding Mechanisms.** The NRC examined the results of five cost studies in determining the cost advantages of different financing options. The agency found comparisons difficult to make because of the large numbers of sometimes conflicting variables affecting cost determinations. Such determinations are sensitive to even small changes in interest and discount rates, federal tax policies, rates of inflation, expected plant lives, and amortization in depreciation schedules. (23)

Still, a comparison of different financing options does disclose several important cost trends. Assuming that all funds are equally taxable, for instance, prepayment is the most costly method—about three times as expensive as internal unsegregated funding. Similarly, the NRC found external sinking funding to be twice as expensive as internal unsegregated funding. (24) Wood did not rate internal segregated funding in the NRC study, but claims that it would generally be about as expensive as external sinking funding. (25)

D.5

All funds will not be equally taxable under current law, however. As part of the 1984 Deficit Reduction Act, Congress disallowed current tax deductions for internal unsegregated funds—a blow to utilities looking for tax breaks to help finance their plants under construction. While Congress did allow segregated funds to qualify for tax deductions, their value to utilities has been diminished by two provisions. Treasury is given the authority to base deductions on the present worth of the fund's assets at the time the plant would be decommissioned. Meanwhile utilities must pay tax on the interest earned by the decommissioning funds. (26) The utilities will be fighting to repeal these restrictions.

**Equity of Funding Options.** The fairest approach from the utility customer's standpoint would be for ratepayers to contribute equal amounts every year, measured in constant dollars, for the lifetime of each nuclear plant. This would fulfill the utility regulatory principle that those benefiting from a plant's power generation should bear the cost of building and operating it.

One important complicating factor in the equity issue, though, is the likelihood that decommissioning cost estimates will be revised over the years. Wood observes:

*As costs change, the annual payments embodied in any funding alternative will have to be changed commensurately. If we assume that cost changes will inevitably be in the direction of higher costs than estimated, later customers would be required to pick up a proportionately greater share of the costs, other things being equal. (27)*

D.3.2.2.4

If cost estimates are accurate, the Temple, Barker and Sloane study has found that prepayment will be the most equitable financing arrangement for ratepayers, assuming a straight-line amortization schedule is used for the plant. Under the same conditions, external sinking funding is the second

most equitable method. The internal unsegregated fund is the least equitable because utility accounting practices would result in higher costs for customers in the early years and lower costs for customers in later years. (28)

Administrative impacts and costs of the various decommissioning finance methods, according to the NRC, are approximately equal for "plant-specific" financing methods. All would require a fair amount of administrative work to function properly.

Studying each method's "responsiveness to change," or flexibility, the Commission found that all three of the plant-specific financing methods could be made responsive to changes in technology, interest rates, and inflation. The internal unsegregated funding and external sinking funding methods were found to be the most easily adapted to change, because utilities can easily increase or decrease their contributions to such funds. The NRC found prepayment to be somewhat less flexible, but noted that it can be modified to increase its flexibility. (28) Strangely, the Commission found internal unsegregated funding, "responsive to change," but also found it to be "fraught with uncertainty" and of "marginal" usefulness in assuring future availability of funds, leaving it unclear as to how to evaluate "responsiveness" as a selection criterion. Similarly, the "less flexible" method of prepayment appears to be the single best method for assuring the future availability of decommissioning funds.

#### The Uncertain Future of Phantom Funds

Utilities using phantom funding argue that by the middle of the next century, when decommissioning funds are actually needed, they can raise money for this purpose by issuing bonds backed by the additional assets they financed through the use of their internal unsegregated funds. However, while bond investors do consider the availability of "first liens" on utility property to back up the face value of the bonds, they are more concerned with utility bond ratings in making investment decisions. The financial health of the utility at the time the decommissioning bonds are marketed will determine the bond ratings and, in turn, the marketability of the bonds.

But future financial health of utilities cannot be assured. As recently as the early 1980s, the utility industry was said by the business press to be entering into a period of serious financial problems. (29) Today the health of most non-nuclear utilities has improved, but many nuclear-dependent companies in the industry are still in trouble. Some are in serious trouble, including Consumers Power in Michigan which was finally forced to stop construction of its Midland reactor; Long Island Lighting Company building Shoreham which may never operate; Public Service of Indiana which has been forced to stop building Marble Hill; and three utilities involved in the Seabrook plant—Public Service of New Hampshire, United Illuminating in Connecticut and the small Fitchberg Gas and Electric in Massachusetts. For several of these utilities the possibility of bankruptcy is being seriously discussed. How, then, can the financial viability of utilities be assured thirty to fifty years from now?

Meanwhile, another trend is underway which could undermine the utility industry's future legal responsibilities for

decommissioning. Utility interest in diversification into non-utility enterprises has been increasing recently, in response to stagnation in the growth of electric sales and excess revenues once new units are placed in service. (30) Recent examples of such diversification include Pacific Power and Light Co.'s plans to launch its own telecommunications satellite to service its own telephone subsidiary and power-company involvement in such novel endeavors as graphics design, the running of boat marinas, and the provision chilled water service to shopping centers. Involvement in highly competitive, risky new businesses like telecommunications could expose electric utilities to substantial financial losses. (31)

A number of utilities are planning to diversify through the use of holding companies, in order to insulate their non-utility operations from utility regulation. This trend may be accelerated by utilities seeking more lenient FERC regulation. (32) Critics of utility holding companies fear that once a utility has formed a holding company for non-utility purposes, the new corporation may first use the old power company as a 'cash cow' to provide capital for unregulated business endeavors. (33) Once the cash cow has been "milked," it may then have the electric utility "spun off" in a financially weak condition. The weakened power companies left behind by such successful holding-company maneuvers, of course, might find it very difficult financially to fund full decommissioning efforts. Accordingly, the growth of utility "holding companies" may pose a long-term threat to the financial integrity of the nuclear decommissioning process.

Should the Commission fail to provide adequate guidelines for the financing of decommissioning which are responsive to legal and financial realities, it is utility ratepayers who will suffer the consequences. As noted earlier, such a financial failure could also leave this nation vulnerable to a breakdown in the decommissioning process which would pose radioactive hazards to untold future generations.

#### Footnotes, Chapter 4

1. Wood 1983:49.
2. Wolf 1983:406.
3. Ryan 1983:1.
4. Wood 1983:1.
5. Ibid:49.
6. Chapman 1980:51-52. The letter to the NRC was dated December 14, 1977.
7. Wood 1983.
8. See 42 FR 40063 (1977).
9. Wood 1983:37.
10. Chernick et al. 1981.
11. Wood 1983:40.
12. Anderson 1984:21.
13. Wood 1983:1.
14. Ibid.
15. Ibid:5-7.
16. Ibid:11.
17. Temple, Barker and Sloane 1980:V-1.
18. Wood 1983:12.
19. Ibid:13.
20. Ibid:12.

D.3.2.1.1  
(a)

D.8.2.1

D.3.2.2.4

D.3.2.1.1  
(a)

21. Ibid:49.
22. Ibid:12.
23. Ibid:13.
24. Ibid:29.
25. Robert S. Wood (NRC), personal communication, 15 February 1984.
26. Deficit Reduction Act of 1984, PL 98-369, Section 468a.
27. Robert S. Wood (NRC), personal communication, 15 February 1984.
28. Wood 1983:31.
29. Ibid:31-33.
30. See Fenn 1984:95-105.
31. *Wall Street Journal* "Fearing Slower Demand for Energy, Utilities Move Into New Businesses" Sept., 4 1984:31.
32. Pfeffer and Lindsey 1984.
33. Anderson 1984.

Table 13.  
First Year Funds for Decommissioning Collected from Ratepayers

Unit	Commercial Operation	Number of Years Operating as of 1964 <sup>a</sup>	First Year Funds for Decommissioning Collected from Ratepayers	Number of Years Unit Operating Before Decommissioning Funds Collected	First Year Funds for Decommissioning Evaluated as Salvage Costs	Number of Years Unit Operating Before Salvage Costs Reassessed
Farley 1	1977	7	---	---	1979	1
Farley 2	1981	3	---	---	1981	0
Bronze Ferry 1	1974	10	1977	3	---	---
Bronze Ferry 2	1975	9	1977	2	---	---
Bronze Ferry 3	1977	7	1977	0	---	---
Arkansas Nuclear 1	1974	10	1974	0	1980	6
Arkansas Nuclear 2	1980	4	1980	0	1980	0
Rumboldt Bay	1983	13	1972	0	---	---
Diablo Canyon 1 <sup>c</sup>	1984	0	N/A	N/A	N/A	N/A
Bancho Seed 1	1975	9	1980	5	---	---
San Onofre 1	1968	14	1978	10	---	---
San Onofre 2	1983	1	1983	0	---	---
San Onofre 3 <sup>d</sup>	1984	0	N/A	N/A	N/A	N/A
Pt. St. Vrain	1970	5	---	---	---	---
Cr. Yankee	1960	10	1976	10	---	---
Millstone 1	1970	14	1977	7	---	---
Millstone 2	1975	9	1977	2	---	---
Crystal River 3	1977	7	---	---	---	---
Turkey Point 2	1972	12	---	---	---	---
Turkey Point 4	1973	11	---	---	---	---
St. Lucie 1	1976	8	---	---	---	---
St. Lucie 2	1983	1	---	---	---	---
Edwin I. Hatch 1	1975	9	1977	2	---	---
Edwin I. Hatch 2	1979	5	---	---	---	---
Dresden 1	1960	18	---	---	1980	16 <sup>1</sup>
Dresden 2	1970	14	---	---	1980	10
Dresden 3	1971	13	---	---	1980	9
Zion 1	1972	11	---	---	1980	7
Zion 2	1974	10	---	---	1980	6
Quad Cities 1	1972	12	---	---	1980	8
Quad Cities 2	1972	12	---	---	1980	8
La Salle 1	1982	1	1982	0	---	---
Deane Arnold	1975	9	None collected	0	None collected	0
Maine Yankee	1972	12	1982	10	---	---
Chilvert Cliffs 1	1975	9	1975	0	---	---
Chilvert Cliffs 2	1977	7	1977	0	---	---
Pilgrim 1	1972	12	1983	11	---	---
Yankee Rowe	1981	23	1981	20	---	---
Big Rock Point <sup>d</sup>	1983	21	1975	12	---	---
Palisades <sup>d</sup>	1971	13	1975	4	---	---
Donald C. Cook <sup>e</sup>	1975	9	None collected	0	None collected	0
Donald C. Cook <sup>e</sup>	1978	6	None collected	0	None collected	0
Huntsville	1971	13	---	---	1981	10
Prairie Island 1	1972	11	---	---	1981	8
Prairie Island 2	1974	10	---	---	1981	7
Grand Gulf 1 <sup>c</sup>	1984	0	N/A	N/A	N/A	N/A
Cooper	1974	10	1984	10	---	---
Pt. Calhoun	1973	11	1983	10	---	---
Oyster Creek	1980	15	1977	0	---	---
Balem 1	1977	7	1977	0	---	---
Balem 2	1981	3	1981	0	---	---
Indian Pt. 1	1982	12	1975	N/A <sup>b</sup>	1979	N/A <sup>b</sup>
Indian Pt. 2	1973	11	1975	2	1979	6
Indian Pt. 3	1976	6	---	---	---	---
Flintpatrick	1973	9	---	---	---	---
Nine Mile Pt. 1	1980	15	1978	0	1981	12
Glenn	1970	14	---	---	1980	10
Brunswick 1	1977	7	1977	0	1979	2
Brunswick 2	1975	9	1975	0	1979	4
McChire 1	1981	3	1981	0	---	---
McChire 2 <sup>e</sup>	1984	0	N/A	N/A	N/A	N/A
Davis-Bussie 1	1977	7	---	---	---	---
Trojan	1976	8	1978	2	1981	5
Beaver Valley 1	1976	8	---	---	---	---
Three Mile Is. 1	1974	5	---	---	---	---
Three Mile Is. 2 <sup>f</sup>	1978	<1	None collected	N/A	None collected	N/A
Buquohanna 1	1983	1	1983	0	---	---
Peach Bottom 2	1974	10	---	---	---	---
Peach Bottom 3	1974	10	---	---	---	---
Shippingport <sup>g</sup>	1957	25	None collected	N/A	None collected	N/A
M.B. Robinson	1971	13	1975	4	---	---
Onondaga 1	1972	11	---	---	---	---
Onondaga 2	1974	10	---	---	---	---
Onondaga 3	1974	10	---	---	---	---
Sumner 1 <sup>c</sup>	1984	0	N/A	N/A	N/A	N/A
Sappony 1	1981	3	1982	1	---	---
Sappony 2	1982	2	1982	0	---	---
Vermont Yankee	1973	12	1983	11	---	---
Berry 1	1972	12	1975	3	---	---
Berry 2	1973	11	1975	2	---	---
North Anna 1	1978	6	---	---	---	---
North Anna 2	1980	4	---	---	---	---
Hanford N. <sup>g</sup>	1980	0	None collected	N/A	None collected	N/A
La Crosse	1980	15	None collected	N/A	None collected	N/A
Point Beach 1	1970	14	---	---	1983	13
Point Beach 2	1972	12	---	---	1983	11
Kewaunee	1974	10	1974	0	---	---

ratepayers in many cases reflects the first year nuclear plant depreciation began, although decommissioning costs were deemed as equal to those of non-nuclear units for a number of years through "negative net salvage" accounting. Thus, figures presented may be inaccurately conservative. In seeking more detailed information, the author also asked Commission and utility staff for the "First year funds for decommissioning evaluated as different from non-nuclear units."

(-) Indicates information for this unit was unavailable

N/A indicates an answer to this question is not appropriate.

<sup>b</sup>Rounding was used in determining the number of years units had operated. Therefore, values may be inaccurate by up to one-half year

<sup>c</sup>This unit was not yet in commercial operation as of March, 1984

<sup>d</sup>Funds were collected from ratepayers through depreciation for nuclear plant from 1975 to 1979

<sup>e</sup>No funds have been collected for decommissioning Donald C. Cook 1 & 2 in the state of Michigan. The state of Indiana and the Federal Energy Regulatory Commission (FERC) began charging customers a small amount for decommissioning in 1983

<sup>f</sup>The accident at Three Mile Island took place before customers were charged for decommissioning.

<sup>g</sup>This plant is owned by the federal government. Costs of decommissioning were not, therefore, charged to ratepayers. Taxpayers will be paying the costs of decommissioning.

<sup>h</sup>Charges for decommissioning were not made until after the unit had shut down

<sup>i</sup>Costs of decommissioning greater than those for a non nuclear unit were not made until two years after the unit had shut down.

Table 14.  
Decommissioning Financing Methods for Nuclear Power Plants by State 1984

State	Number of Plants	Plants with Phantom Funding (b)	Plants with Internal Segregated Funding (c)	Plants with External Sinking Funding (d)	Plants with No Funding Provisions	Plants to be Funded by DOE
AL	5	2	3	----	----	----
AR	2	2	----	----	----	----
CA (e)	6	5	1	----	----	----
CO	1	----	----	1	----	----
CT	3	3	----	----	----	----
FL	5	----	5	----	----	----
GA	2	2	----	----	----	----
IL	8	8	----	----	----	----
IA	1	----	----	----	1	----
ME	1	----	----	1	----	----
MD	2	2	----	----	----	----
MA	2	----	----	2	----	----
MI	4	2	----	----	2	----
MN	3	3	----	----	----	----
MS (f)	1	----	----	----	----	----
NB	2	----	2	----	1	----
NJ	3	3	----	----	----	----
NY	6	6	----	----	----	----
NC	4	4	----	----	----	----
OH	1	1	----	----	----	----
OR	1	1	----	----	----	----
PA (g)	7	----	----	6	----	1
SC	5	4	1	----	----	----
TN	2	----	2	----	----	----
VT (h)	1	----	----	1	----	----
VA	4	4	----	----	----	----
WA (g)	1	----	----	----	----	1
WI	4	3	----	----	1	----
TOTAL	87	55	14	11	5	2
Number of States	28	17	6	5	4	2

TABLE 14. Footnotes

<sup>a</sup>This table includes both licensed commercial operating reactors in January 1984 and inoperable reactors described in Table 2. It includes the Hanford-N and Shippingport reactors, somewhat arbitrarily, on the basis of their inclusion in the Inventory of Power Plants in the United States (DOE/EJA) over the years. Five units with low-power or full-power licenses as of December 31, 1983 are included: Grand Gulf (MS), Diablo Canyon (CA), San Onofre 3 (CA), McGuire 2 (NC), and La Salle 1 (IL). Only Grand Gulf and Diablo Canyon had not gone into commercial operation as of December 1, 1984.

The table describes methods in use by principle owners of 87 units. It does not illustrate policies implemented conceptually but not yet in practice.

As Appendix B describes, many plants have joint owners. Joint owners generally use methods approved for utilities in their states by state regulatory commissions.

Table 4 provides reactor specific details of methods used.

Dash marks (--) indicate no plants use this financing method.

<sup>b</sup>Phantom funding (also referred to as internal unsegregated financing) is defined as an accounting procedure generally using negative net salvage value depreciation, which allows estimated decommissioning costs to be charged to ratepayers over the life of a facility. However, no funds are actually set aside for decommissioning when this practice is used. Utilities plan to raise funds needed for decommissioning in future years. Unspent funds collected from ratepayers for decommissioning are available to the utility for general purposes (e.g. plant construction).

<sup>c</sup>Internal segregated funding is defined as a financing method whereby the utility itself physically sets aside funds for decommissioning and invests these funds in such a way that they are separate from utility assets.

<sup>d</sup>External sinking funding as defined as a financing method whereby funds for decommissioning are collected in an escrow account managed by an outside trustee. Funds are invested in high-grade corporate securities, federal debt obligations, state or municipal tax-free securities, or other assets.

<sup>e</sup>Although California Public Utilities Commission conceptually adopted external sinking funding in 1983, implementation will not occur until sometime in 1985. As of December 1, 1984 no utilities in California had established external financing provisions.

<sup>f</sup>As of December 1, 1984, Grand Gulf was not yet in commercial operation. Although the Federal Energy Regulatory Commission (FERC) recommended external sinking funding for the unit in 1984, funds will not be collected for decommissioning until commercial operation sometime in 1985.

<sup>g</sup>The Shippingport (PA) and Hanford N (WA) reactors are owned by the U.S. Department of Energy. Decommissioning of these plants will be paid for by the federal government.

<sup>h</sup>As of October 1983 decommissioning funds for Vermont Yankee have been held in an unmanaged escrow account out of company hands earning money market interest rates. The final settlement agreement whereby parties involved agreed to external sinking funding for Vermont Yankee was issued in Spring 1984. The utility plans to develop a professionally managed trust fund by early 1985.

Decommissioning Funds Collected by Principal Plant Owner  
Versus Estimated Costs of Decommissioning by State 1984

State	No. of Units	Average Remaining Unit Life (Years)	Multi-Company Responsibility for Costs <sup>3</sup>	Total Estimated Cost of Decommissioning (Millions of 1983 \$) <sup>4</sup>	Total Funds Collected by Principle Unit Owners-Year end 1983 (Millions of 1983 \$) <sup>5</sup>
AL	5	27	NO	255.4	APPROX. 34.0 <sup>16</sup>
AR	2	26	NO	75.0	12.6 <sup>17</sup>
CA	6	19 <sup>8</sup>	YES	618.4	39.5
CO	1	24	NO	39.9	2.7
CT	3	23	NO	323.3	37.7
FL	5	27	YES	384.4	74.4 <sup>18</sup>
GA	2	32	YES	133.2	10.3
IL <sup>6</sup>	8	24 <sup>9</sup>	YES	473.2 <sup>14</sup>	84.7 <sup>14</sup>
IA	1	26	YES	NONE DETERMINED	NONE COLLECTED
ME	1	24	NO	122.0	2.1
MD	2	25	NO	93.7	8.2
MA	2	19	NO	127.3	3.5 <sup>19</sup>
MI	4	22	YES	290.0	13.1
MN	3	20	NO	163.5	34.9
MS	1	30 <sup>10</sup>	NO	106.6	NONE COLLECTED
NB	2	24	NO	177.0	1.5
NJ	3	24 <sup>11</sup>	YES	294.8	APPROX. 33.3 <sup>21</sup>
NY	6	18	NO	335.3	79.8
NC	4	26	YES	263.1	25.7 <sup>22</sup>
OH	1	27	YES	53.0	UNAVAILABLE
OR	1	27	YES	33.8	5.2
PA	7	22 <sup>12</sup>	YES	470.8 <sup>15</sup>	22.2 <sup>23</sup>
SC	5	24	YES	325.4	12.9 <sup>24</sup>
TN	2	29	NO	102.0	APPROX. 14.0 <sup>16</sup>
VT	1	23	YES	82.9	.6
VA	4	26	YES	230.8	8.8 <sup>25</sup>
WA <sup>7</sup>	1	--	NO	NOT AVAILABLE	NONE COLLECTED <sup>26</sup>
WI	4	24 <sup>13</sup>	YES	171.3	61.0

TABLE 15. Footnotes

<sup>1</sup>Principal nuclear plant owner refers to the utility, holding company or other entity primarily responsible for operating a unit. Appendix B lists individual unit owners. Principal owners are designated by an asterisk. Generally, these entities are responsible for 50 percent or more of the costs of decommissioning.

This table includes data for 87 units licensed by 1984, including six inoperable reactors. Appendix 1 of this report discusses units surveyed in detail. This table is not designed to be an exact representation of decommissioning costs. In collecting this information for 87 plants, some inaccuracy is inevitable. Instead, the table is meant to provide an approximation of monies collected to date in relationship to estimated costs of decommissioning.

Table 9 lists data for individual units.

<sup>2</sup>Average remaining unit life was developed by taking the license expiration date for each unit and averaging it, then subtracting 1984 from this year. Units with provisional operating licenses were not included. Permanently inoperable units were included using their shutdown dates as license termination dates. This value does not consider the likelihood for premature shutdown or for operating license renewals.

<sup>3</sup>This column indicates whether "total funds collected by principle unit owners" lists all monies collected for decommissioning in any particular state, or not. It refers to companies responsible for decommissioning costs. Unit ownership structures can require that individual unit owners each collect funds from ratepayers for decommissioning. However, some plant owner/operators, such as single asset corporations (e.g. Vermont Yankee Atomic Corp.), are responsible for collecting all the funds necessary for decommissioning.

<sup>4</sup>Figures for total estimated costs of decommissioning include varying assumptions of type of decommissioning planned and resultant costs. The author has not attempted to break down these individual costs to ensure uniformity of responses. Costs are included as reported by state regulatory commissions and utilities in summation. Table 9 describes details of the conversion factor used for putting figures in 1983 dollars.

<sup>5</sup>Figures are current to December 31, 1983 unless otherwise indicated.

<sup>6</sup>This does not include data for La Salle 2.

<sup>7</sup>This does not include data for WPPSS 2.

<sup>8</sup>Diablo Canyon was not included since the unit did not have an operating license as of June 1984.

<sup>9</sup>Dresden 2 has a provisional operating license and, therefore, was not included.

<sup>10</sup>Grand Gulf's operating license expires in 2014. However, its owner in 1983 applied to extend this license to 2022. Although NRC denied the extension until the plant receives a commercial license, it is likely that the license expiration date will be changed to 2022 by 1985.

<sup>11</sup>Oyster Creek has a provisional operating license and, therefore, was not included.

<sup>12</sup>Shippingport was not included since costs of decommissioning will be born by the federal government.

<sup>13</sup>La Crosse has a provisional operating license and, therefore, was not included.

<sup>14</sup>Decommissioning costs for Dresden 1 do not include an estimated \$42 million which Comm. Ed. plans to spend to decontaminate the unit. Nor is the \$33 million collected from ratepayers for this task included as part of decommissioning funds collected.

<sup>15</sup>This does not include costs for Shippingport which are being paid by the federal government. Costs of decommissioning Susquehanna 2, still under construction as of June 1984, are included as part of costs for Susquehanna 1. Costs for Three Mile Island 2 are not yet known and are, therefore, also omitted.

<sup>16</sup>Funds collected for decommissioning Browns Ferry 1, 2 and 3 also include those for Sequoyah 1 and 2 (TN). In attempting to estimate what funds have been collected for these units, the total sum for five plants has been divided by 5 and a per plant sum determined. This is a total of \$21 million for Browns Ferry 1, 2 & 3 and \$14 million for Sequoyah 1 & 2.

<sup>17</sup>This data is current to February 1984.

<sup>18</sup>Current values for Turkey Pt. 3 & 4 and St. Lucie 1 & 2 were unavailable. In attempting to estimate the amount collected the author formulated a composite figure for each unit assuming funds for Turkey Pt. 3 & 4 and St. Lucie 1 were 16.2 million as of year end 1981. In 1983, Florida Public Service Commission required: \$5.5, \$4.0, \$5.0 and \$4.8 million to be collected for decommissioning these plants, plus St. Lucie 2. Figures developed, therefore, should be accurate, excluding funds collected for Turkey Pt. 1 & 2 and St. Lucie 1 in 1982 (approx. \$10-14 million)

<sup>19</sup>Estimates of funds collected for Yankee Rowe were unavailable and are not included here. Yankee Atomic Corp. has collected 1 mill per kilowatt-hour generated since 1981 to cover the cost of decommissioning.

<sup>20</sup>No funds had been collected for Grand Gulf 1 as of June 1984 since it had not yet received a commercial operating license.

<sup>21</sup>Public Service Electric and Gas Co. has collected \$43 million for decommissioning its four units. In order to estimate funds collected for Salem 1 & 2 alone, half of \$43 million was assumed, \$21.5 million.

<sup>22</sup>Figures for McGuire 1 & 2 were unavailable and are not included here.

<sup>23</sup>Shippingport is not included since costs will be paid by the federal government. This figure also does not include values for Beaver Valley 1. The value for TMI 1, \$368,000, includes Pennsylvania companies' share of costs, 75%.

<sup>24</sup>No funds were collected for Summer 1 as of year end 1983. The amount for Oconee 1, 2 & 3 is unavailable. Funds listed are for H.B. Robinson 2 current to 3/31/84.

<sup>25</sup>This is current to March 1982. Funds through 1983 were not available.

<sup>26</sup>Funds for Hanford-N are not included since the plant is owned by the federal government, which will pay decommissioning costs

Decommissioning Methods Assumed for Ratemaking Purposes by State 1984

State	Immediate Dismantlement	Temporary Storage	Permanent Entombment	Entombment with delayed Dismantlement	Undetermined <sup>b</sup>	Unavailable
AL	5					
AR	2					
CA <sup>c</sup>	4	1			1	
CO					1	
CT	3					
FL	5					
GA	2					
IL <sup>c</sup>	8					
IA					1	
ME	1					
MD	2					
MA	2					
MI	1	1			2	
MN	3					
MS						1
NB	2					
NJ			1		2	
NY <sup>c</sup>	5	1				
NC	2			2		
OH				1		
OR				1		
PA <sup>d</sup>	6				1	
SC	1			1	3	
TN	2					
VT	1					
VA		4				
WA						1
WI	3				1	
<b>TOTAL</b>	<b>60</b>	<b>7</b>	<b>1</b>	<b>5</b>	<b>12</b>	<b>2</b>
<b>% OF TOTAL</b>	<b>69</b>	<b>8</b>	<b>1</b>	<b>6</b>	<b>14</b>	<b>2</b>

TABLE 16. Footnotes

<sup>a</sup>Methods used by utilities for ratemaking purposes are viewed as tentatively scheduled since companies are collecting an amount from rate payers which will equal the presumed cost of decommissioning using this method. However, final methods chosen will depend on a variety of factors at the time decommissioning takes place. Definitions of decommissioning methods are described in Chapter 1 of this report. Table 4 lists reactor specific policies.

<sup>b</sup>Undetermined means that for ratemaking purposes the utility has not assumed a specific decommissioning method will be used. Instead, some type of general cost figure is being used in order to collect money for future decommissioning from ratepayers.

<sup>c</sup>The Humboldt Bay (CA), Dresden 1 (IL), and Indian Pt 1 (NY) reactors have been shut down since 1976, 1978, and 1974 respectively. These units are in a form of temporary storage now, although only minor precautions have been taken to make the reactors safe to the public. Pending NRC approval, as of Dec. 1984, owners of these plants intend to more formally place units in temporary storage. Immediate dismantlement is currently assumed for Dresden 1 and Indian Pt 1.

<sup>d</sup>The Shippingport reactor decommissioning, scheduled to begin in 1985, does not include dismantling the reactor vessel onsite. Instead, the vessel will be removed intact and taken by barge to Hanford WA. This method, therefore, does not fall under the more typical definition of immediate dismantlement, described in chapter 7 of this report. Nonetheless, it is categorized as such here.

No decommissioning method has been chosen for TMI 2.



## Chapter Five The Myth of Immediate Dismantlement and Site Restoration

For more than 30 years, defenders of nuclear power have assured the public that "atomic power plants don't explode." While reactor decommissioning certainly does not involve fission-produced explosions, the use of "explosive decontamination" to dismantle reactor vessels does not inspire public confidence that radioactive contamination of the surrounding landscape can be avoided. Yet many experts are counting on using small, controlled explosions to dismantle reactors in the 1000-megawatt range. The use of explosives inserted in the steel-enforced concrete walls of modern reactors is supposed to enable workers to use flame-cutting tools and specially designed saws to slice through the walls. Much of this process is supposed to be carried out underwater to help protect workers from radiation exposure. (The use of robots is also being actively pursued.) Here is how one writer describes "explosive decontamination":

C.1.11

*Four to five strands of 150-grain blasting cord twisted together and placed in a tube inserted in the hole are effective, as are partial sticks of dynamite. Liquid explosives can be used where it is difficult to insert solids. The size of the area to be blasted at one time is controlled, so that an accident involving the explosives used presents an acceptably low potential for damage . . . Each blast is conducted with the individual charges sequenced to minimize the resulting shock wave. (1)*

Given that the reactor being "explosively decontaminated" might have 30 years worth of accumulated radioactivity permeating its walls and tubing, cracking apart the reactor's vessel with even "partial" sticks of dynamite should not be taken lightly. Studies by Battelle and others indicate that the process is likely to involve high levels of radiation exposure to the workers involved in dismantlement.(2) Exposure levels would be highest with immediate dismantlement, since radioactive particles decay over time.

### Planned Decommissioning Methods for Today's Reactors

B.4.2

Nearly 70 percent of today's licensed commercial nuclear plants have been tentatively scheduled for immediate dismantlement at the end of their operating lives, according to Public Citizen's survey. Table 16 lists immediate dismantlement as the method assumed for rate-making purposes for 60 reactors. Another 7 reactors have been tentatively scheduled

for temporary storage followed by delayed dismantlement. One reactor is scheduled for permanent entombment, and another 5 are slated for temporary entombment followed by delayed dismantlement. No decommissioning method has yet been chosen for 12 reactors. Instead, the utilities owning them have put forward very general cost calculations to justify their collection of decommissioning funds. Data for specific reactors is included in Table 4.

### Occupational Exposure to Radiation During Immediate Dismantlement

Immediate dismantlement is attractive to utilities who want to dispel uncertainty surrounding decommissioning, by demonstrating their ability to dismantle the reactor and fully restore the site for general use. As described by the NRC and the industry, it also appears to be well understood, cheap, and easy. (3)

In fact, the risks involved in immediate dismantlement should not be underestimated. Table 17 describes the occupational exposure to radiation that the Battelle studies have estimated will accompany the immediate dismantling of a "reference" pressurized water reactor (PWR) and a "reference" boiling water reactor (BWR). The data, like other data developed by Battelle, is based on calculations from the dismantlement of the 22-megawatt Elk River plant, experiences in operating nuclear plants today, and simulation experiments involving the cutting and breaking apart of non-nuclear materials. As Table 17 indicates, Battelle's estimated occupational exposure for dismantling a PWR is 1200 person-rems(4) and for a BWR, 1845 person-rems. (5) (Person-rems measure radiation exposure in terms of its expected impact on human health.)

B.4.2

In comparison, the government has set an exposure level of half a rem or 500 millirems per year as the maximum annual dosage of radiation for an individual adult. For the general population, the recommended average dose is no more than 170 millirems. (6) The maximum exposure allowed for workers in the nuclear industry is 5 rems per year or 3 rems a quarter. Thus Battelle's 1200 rem estimate for a single PWR dismantlement represents the maximum exposure of 240 workers in one year or the recommended maximum exposure of 7059 members of the general population in a single year. The 1845 person-rem estimate for a BWR dismantlement represents the maximum annual exposure of 369 workers of the maximum recommended exposure of 10,853 individuals.

These predictions, of course, could be wrong—as recent experience in decontaminating the Three Mile Island reactor suggests. According to recent calculations by the NRC, decontamination workers at Three Mile Island No. 2 will probably receive six times the radiation doses that were estimated for them in 1981. (7) Similarly, the Battelle figures may underestimate worker exposure levels.

#### The Waste Disposal Dilemma

Decommissioning is fraught with problems related to disposal of the low-level and high-level nuclear waste generated in the decommissioning process. Disposal of nuclear waste following immediate dismantlement will be problematic because of the volume of low-level waste involved, transportation of the waste, the amount of radioactivity involved, the determination of how to classify the waste, and the lack of suitable waste disposal sites.

**Low-level Waste Volumes.** The Battelle study estimates that immediate dismantlement of a PWR will generate 17,924 cubic meters of low-level radioactive material—an amount equivalent to about one-quarter of the volume of low-level waste currently generated each year in the U.S. (8) The waste generated from existing reactors and those under construction in 1981 would require the equivalent of three to four entire low-level waste burial sites, according to a study for the NRC by Elder and Murphy. (9)

**Transportation.** As shown in Table 18, the transportation of low-level wastes from a single PWR decommissioning will require the shipment of 1363 truckloads of radioactive material, if immediate dismantlement is used. About 1,495 truckloads of waste will have to be transported away from a reference BWR plant. (10) If all 87 currently licensed reactors were decommissioned using the immediate dismantlement method, more than 80,000 truckloads of low-level radioactive waste would have to be removed from reactor sites and driven to low-level waste burial grounds. (11) The more waste transported, the greater the chance of radioactive exposure to workers handling the waste and to the general public in the event of a transportation accident. While fewer shipments will be required for the highly radioactive fuel rods, the transportation risks are far greater. (See Resnikoff, *The Next Nuclear Gamble*.)

**Radioactivity.** A typical PWR reactor vessel and its components, excluding fuel rods, is expected to contain approximately 4.8 million curies of radiation at the time the reactor is ready for final shutdown. A reference BWR is expected to contain an estimated 6.6 million curies. (12) A curie is equivalent to the amount of radiation contained in one gram of radium.

Some radiation contained in the reactor vessel is long-lived. Table 20 lists curie content for major activated reactor components for the reference PWR. Appendix C contains a diagram of a PWR. As noted in Table 19, Niobium-94 and Nickel-59 contained in the reactor components of a typical PWR have radioactive half-lives of 20,000 years and 80,000 years, respectively. The reactor's Molybdenum-93, with a half-life of 3,500 years, and its Carbon-14, with a half-life of 5,750 years, are other wastes that will not decay quickly.

However, other radioactive isotopes in a PWR or BWR

reactor have much shorter half-lives and will decay significantly if immediate dismantlement is postponed. Cobalt-60, for instance, has a half-life of 5.3 years and is considered by the NRC to have "the most effect on decontamination efforts." For this reason, it is termed the "critical/abundant nuclide." (NRC Proposed Rule on Decommissioning Criteria, Feb. 11, 1985, p. 5604.) Significant decay of Cobalt-60 would occur with temporary storage, a significant advantage to this option.

**Waste Classification Problems.** In addition to the "high level" and "low level" wastes contained in each shut-down reactor, there are likely to be an estimated 11.5 cubic meters of densely packed radioactive material that is of an "intermediate" level—at least in the eyes of nuclear regulators. (13) This waste includes a number of highly "activated" concrete and metal components from the reactor, including the core shroud, the lower core barrel, the upper and lower core grid pieces, and the thermal neutron shield pads. (14) According to Dr. Carl Feldman of the NRC, this material is likely to be classified as "low-level" waste, and certainly does not fit the category of high-level waste. (15) But as Table 19 of this report indicates, such components of the reactor contain Nickel-59, Niobium-94 and Carbon-14, all of which have long half-lives. Such long-lived radioactive waste does not belong in a low-level waste burial ground, since its persistent radioactivity could eventually leach from such a burial ground to contaminate groundwater in the area, possibly causing the long-term contamination of underground aquifers.

Where should intermediate-level waste be put? According to Dr. Feldman: "There is no method or special site currently designated for handling these 'intermediate-level' wastes, so they will need to be classified as either high or low level." (16) Classifying such waste as low-level and burying it in low-level waste landfills is environmentally unacceptable and is likely to cause a public outcry. Classifying it as "high level" waste and arranging for deep geological disposal, meanwhile, would significantly increase the waste-management costs attending a reactor dismantlement. (17) This dilemma must be resolved before immediate dismantlement is allowed as an option.

**Unavailability of High-level Nuclear Waste Site.** At present, no high-level waste repository exists in this country to accept the spent fuel and other high-level radioactive wastes created by decommissioning. Under the Nuclear Waste Policy Act of 1982, a facility for disposing of such high-level wastes is scheduled to become available by 1998. (18)

But critics of this plan, such as David Berick of the Environmental Policy Institute, say none of the Department of Energy's deadlines for developing such a repository are achievable. According to Berick, "[The high-level waste disposal site] deadline is no more realistic than any other. In fact, it can be met only through a series of somewhat fantastic assumptions probably requiring divine intervention . . . and certainly requiring unique interpretations of the Nuclear Waste Policy Act and NRC and state participation." (19)

Meanwhile, local and state government units in almost every state where high-level waste disposal sites are under consideration have strenuously opposed locating such a site in their backyards. (20) Given the political and technical roadblocks to making a high-level waste disposal site available, such a facility may not be established until 2010 or

B.4.2

H.1.1.1

B.4.2

H.1.1.4

later.

H.1.1.4

Without a high-level waste site, immediate dismantlement would be difficult at best. Temporary storage of spent fuel rods on site either in fuel pools or in dry storage is a likely scenario. Monitored retrievable storage at centralized sites to accommodate spent fuel rods is also under active consideration by the Department of Energy. On-site storage of spent fuel will interfere with making the reactor site available for alternative use under the immediate dismantlement scenario. Other reactor components such as the vessel itself also require a high-level site for disposal.

B.4.2

The NRC requested Battelle to examine the lack of high-level and low-level waste sites included in Addendum 1 and Addendum 2 of the Battelle studies. The addendums examine how a utility's inability to dispose of wastes in an offsite location will affect different decommissioning methods.(21) Table 20 describes the decommissioning alternatives that appear feasible, assuming onsite storage of spent fuel and low-level wastes. As the table indicates, only "partial" decontamination and dismantlement is considered practical, if low-level wastes and spent fuel are stored at the reactor site. Battelle's Addendum 1 states: "DECON [Immediate Dismantlement] implies the prompt removal of all decommissioning wastes from the site to allow unrestricted release of the property. Onsite storage of the decommissioning wastes would prevent release of the site until the wastes are subsequently removed to an off-site facility. Therefore, DECON appears to be generally inconsistent with onsite storage of decommissioning wastes." (22)

By this criterion, temporary storage would also be practical. In fact, Battelle's Addendum 1 consistently discusses the temporary storage or SAFSTOR method as being highly adaptable to all waste-storage scenarios. (23) Entombment is ruled out as impractical.

#### 'Decontaminating' Reactors Before Dismantlement

H.1.2.1

Some nuclear planners currently hope for the extensive decontamination of reactor pipes and other nuclear plant components through mechanical or chemical methods before dismantlement begins. Such decontamination is expected to decrease the amount of radioactivity that nuclear workers and the public are exposed to during decommissioning.

According to Battelle official J.R. Divine, such prior decontamination of reactors could make immediate decommissioning feasible. (24) The authors of Battelle's PWR study also recommend that chemical or mechanical decontamination be employed before the temporary storage method of decommissioning.(25) However, there has been some concern that decontamination could become a rationale for indefinitely delaying full decommissioning.

Decontamination involves mechanical and chemical processes. The mechanical decontamination of reactor parts involves the use of lasers, explosives, and/or chipping tools and is primarily used to remove radioactivity from the reactor vessel's bioshield. The pipes are then flushed out with highly corrosive solvents containing chemicals called "chelating agents," which help to dissolve the radioactive "crud," somewhat like using Drano to unclog a sink. Afterwards, both

the "crud" and the chelating agents are removed from the reactor. This process is estimated to have the potential for decreasing occupational exposures during dismantlement by 80-90 percent. (26)

Today, utilities generally bury their wastes from chemical decontamination in low-level waste landfills.(27) However, the chelating agents in the wastes have been found to cause the unexpectedly rapid migration of radioactivity out of such landfills. (28) Battelle PNL and other research organizations are currently studying the products of chemical decontamination. However research is needed to focus more attention on the interactions between chelating agents and other radioactive wastes. M.S. Davis of Brookhaven National Laboratory has pointed out in a recent report: "[T]he potential for enhanced migration of radionuclides from a site used to dispose of the decontamination wastes must be addressed and guidelines established for the safe disposal of these wastes."(29)

H.1.2.1

Given current uncertainties about chelating agents and low-level waste, chemical decontamination should not be relied on as a way to legitimize immediate dismantlement as a decommissioning method. Meanwhile, radioactive wastes bound to chelating agents should not be accepted for burial at low-level radioactive waste landfills, unless there is full assurance that migration problems will not develop.

#### Incentives for Delayed Dismantlement

Battelle studies indicate that the curie level in a reactor declines fairly rapidly up to 50 years following shutdown, after which the curie level declines very slowly. As a consequence, both occupational exposure and volume of waste generated decrease significantly with delayed dismantlement over the next fifty years. Table 17 lists estimated radiation doses that will be sustained by workers under various combinations of decommissioning methods. A delay of 10 years in decommissioning a reactor will likely result in a 37% reduction in occupational exposures, from 1200 rems to around 760 rems. A delay of 30 years in dismantling the reactor would reduce occupation exposures by 62 percent, from 1200 rems to 460 rems. A 50-year delay, however, would further decrease radiation exposures by only a slight amount, to 440 rems. The volume of waste generated would decrease dramatically following a 50-year delay in dismantlement from about 17,900 cubic meters to 1830 cubic meters, a 90 percent decrease. (30) No significant further decrease in waste volume occurs with a delay up to 100 years.(31)

B.4.3

These data lend support for the delay of dismantlement up to 50 years after shutdown, although further delays beyond this time limit are probably unjustified.

#### The Inevitable Need to Dismantle Reactors

The entombment option has been advocated by some utilities, but the NRC has ruled out this option for commercial reactors in its proposed decommissioning rule.

According to Donald Blackman of the Duke Power Co., a former chairman of the decommissioning task force of the Atomic Industrial Forum: "The utilities are not yet willing to

B.5

B.5

concede that permanent entombment should be ruled out because of the presence of long-lived isotopes." (32) However, researchers such as Dr. Marvin Resnikoff, John Stevens, and Dr. Robert Pohl have demonstrated that radioactive 'activation products' in a reactor may continue to remain dangerously radioactive for up to 1.5 million years following shutdown. (33)

The NRC admits that such radioactivity "will not decay to unconditional release levels within the foreseeable lifetime of any man-made surface structure" and concludes that "the long-lived isotopes will have to be removed or the integrity of the entombing structure will have to be maintained for many thousands of years." (34) An "entombed" reactor and its overcoat of concrete will both crumble long before its activation products are safely decayed.

#### The Problem of Residual Radioactivity

Decommissioning is supposed to restore the reactor site to a condition allowing its "full release" for public use. The determination of the allowable level of residual radioactivity is therefore crucial to whether the decommissioning process will result in adequate protection of the public.

Part 2 of the Commission's proposed rule-making on decommissioning is supposed to set residual radioactivity levels required in order for a utility to terminate its reactor's operating license. Since maintaining a reactor's operating license is both inconvenient and costly, utilities will have a real incentive to meet the standard that is adopted. But unfortunately, they also have an interest in pressing for a standard that will be as weak as possible. Not surprisingly, utility executives swamped the Commission with letters urging weak standards for residual radiation during the comment period on the draft Generic Environmental Impact Statement for decommissioning.

E.11

The NRC is expected to propose a standard of 50 millirems maximum full body dose per year. (39) This is equivalent to the radiation received from two and a half chest X-rays, and it is almost one-third of the NRC's recommended average dose for the general population per year (of 170 millirems). It is one-tenth of the recommended maximum dose which an individual adult (as distinguished from a nuclear worker) is allowed to receive in a year. This standard does not include radiation exposures to individuals caused by medical X-rays or background radiation.

Dr. Carl Feldman of the NRC has argued that the country may not need strong decommissioning policies to cover residual radiation, because he expects the NRC licensing division to require reactors to use a 10-millirem limit to meet the Commission's ALARA (As Low As Reasonably Achievable) radiation guidelines. (36) However, if the NRC could in fact depend on ALARA, there would be no need for the NRC to issue a separate rule specifically addressing residual radioactivity at all. In fact, a strong standard is required precisely because ALARA guidelines cannot be enforced in the same way as a standard.

Given that the site is to be restored to general public use, it is reasonable for the NRC to require that when decommissioning is complete, the site should not contain levels of radiation which are greater than the background radiation which was allowed at the site before the reactor operated.

#### Footnotes, Chapter 5

1. Oak et al. 1980b:G-8-G-9.
2. Smith et al. 1978; *Engineering News Record* 1984.
3. Committee for Energy Awareness 1984. A fine example is provided in a recent CEA press release on the decommissioning of Shippingport. According to Ed DeLaney, DOE's project manager for Shippingport, "All the operations we will perform are straight forward and well-known ... DOE plans to decommission the reactor immediately to demonstrate that reactors can be decommissioned safely at reasonable costs." Dr. Carl Feldman of the NRC states, "Decommissioning is basically a salvage job during which radiation exposures to workers are minimized." Delaney describes the 12% of investment cost required to decommission the plant as, "a modest amount."
4. Smith et al. 1978a:2-9.
5. Oak et al. 1980a:2-10.
6. U.S. Dept. of Energy 1980.
7. Maize 1984.
8. Norman 1982:378 Smith et al. 1978a:10-7.
9. Elder and Murphy 1981:6. A utilization factor of 65% is assumed.
10. BWR figures are found in Oak, et al. 1980a:10-3-10-4. Figures do not include spent fuel.
11. This is an approximation assuming that of 87 reactors licensed today 44 percent are over 800 Mwe. Conservatively, waste volume for smaller reactors is estimated to be one-third as high as for large reactors.
12. Oak, et al. 1980a:2-7.
13. Dr. Carl Feldman (NRC), Personal Communication, 27 March 1984.
14. Smith et al. 1978b:G-27.
15. Dr. Carl Feldman (NRC), Personal Communication, 27 March 1984.
16. Ibid.
17. Elder and Murphy 1981:11.
18. U.S. Dept. of Energy 1984:12.
19. Berick 1984:2.
20. *The Energy Daily* 1984 a.
21. Holter and Murphy 1983a,b.
22. Ibid: 2.4.
23. Ibid.
24. J.R. Divine (Battelle PNL), Personal Communication, 19 January 1984.
25. Smith et al. 1978a:9-23.
26. J.R. Divine (Battelle PNL), Personal Communication, 19 January 1984.
27. Davis 1983:xiii.
28. Ibid: 21.
29. Ibid: 32.
30. U.S. Nuclear Regulatory Commission 1981:12.
31. Ibid.
32. Norman 1982:377.
33. Resnikoff 1976.
34. Smith et al. 1978:4-6.
35. Dr. Carl Feldman (NRC), Personal Communication, 27 March 1984.
36. Dr. Carl Feldman, Personal Communication, 21 December 1983.

Summary of Estimated External Occupational Radiation Doses  
for Decommissioning a Reference PWR

Decommissioning Mode <sup>d</sup>	Time After Reactor Shutdown (Years)	Estimated Dose (Person-rem) <sup>e</sup>
Immediate Dismantlement	0	1200
Temporary Storage:		
Temporary Storage Preparations	0	420
Continuing Care	10	10
	30	14
	50	14
	100	14
Deferred Dismantlement	10	330
	30	24
	50	2
	100	1
Total for Temporary Storage with Deferred Dismantlement in Year:	10	760
	30	460
	50	440
	100	430

TABLE 17. Footnotes.

<sup>a</sup>The reference pressurized water reactor referred to in this table is the 1130-MWE Trojan plant used in the Battelle study, from which this table was excerpted. This table does not include radiation doses during transportation or doses to the public.

<sup>b</sup>Definitions of decommissioning methods are given in Chapter 1 of this report. Temporary storage consists of three phases: preparations for storage, continued care, and deferred dismantlement.

<sup>c</sup>A person-rem is a unit measuring the total radiation dose received by the exposed population. Estimates of person-rem of radiation dose have been rounded to two significant figures.

Source: Excerpted from R.L. Smith, G.J. Konzak, and W.E. Kennedy, Jr., *Technology, Safety, and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station*, NUREG/CR-0130 (Washington, DC: U.S. Nuclear Regulatory Commission), Table 2.8-1.

Table 18.  
 Estimated Burial Volumes, Weights, and Truckloads of Radioactive Material Using  
 Dismantlement for a Reference PWR

Material Category	Burial Volume (m <sup>3</sup> ) <sup>e</sup>	Weight (lb) <sup>f</sup>	Truckloads
Spent fuel	37 (bare) 57 (encapsulated)	N/A	----- <sup>g</sup>
Activated <sup>b</sup> :			
Metal	484	3,278,600	216
Concrete	707		
Contaminated <sup>c</sup> :			
Metal & Misc.	5,465	38,381,810	967
Concrete	10,613		
Radioactive Wastes <sup>d</sup>	618	N/A	180
Total	17,924	-----	1,363

TABLE 18. Footnotes

<sup>a</sup>These figures are for a 1175 MWE pressurized water reactor. (-) indicates this information was unavailable to the author.

<sup>b</sup>Activated materials are materials made radioactive by exposure to neutrons or protons.

<sup>c</sup>Contaminated material is material that has been deposited on the surfaces or are internally ingrained into structures or equipment, or that has been mixed with another material.

<sup>d</sup>Radioactive wastes include used ion exchange resins, cartridge filters, evaporator bottoms liquids, and miscellaneous combustible wastes.

<sup>e</sup>0.28317M<sup>3</sup>=1 cu. ft.

<sup>f</sup>1 lb=0.45359 kilograms

<sup>g</sup>Spent fuel is assumed to be shipped by rail. The study assumes 28 shipments are required.

Source: R.I. Smith, G.J. Konzek, and W.E. Kennedy, Jr., *Technology, Safety, and Costs of Decommissioning A Reference Pressurized Water Reactor Power Station*. NUREG/CR-0130 Vol. 1, (Washington, D.C.: U.S. Nuclear Regulatory Commission, June 1978), Table 10.1-4. As above, Vol. 2, Table G.4-4, G.4-5, G.4-6, and page G-30.

## Radioactivity Levels in Major Activated Components at Time of Reactor Shutdown

Isotope	Half-Life	Shroud	Core Mid-Plane Radioactivity (Ci/m <sup>3</sup> )				Lower 5.02 m of Vessel Wall	Upper Grid Plate <sup>(a)</sup>	Lower Grid Plate <sup>(a)</sup>
			Lower 4.72 m of Core Barrel	Thermal Shields	Vessel Inner Cladding				
<sup>95</sup> Nb	35 day	2.0 x 10 <sup>3</sup>	7.6 x 10 <sup>0</sup>	3.5 x 10 <sup>0</sup>	5.6 x 10 <sup>-3</sup>	1.7 x 10 <sup>-3</sup>			
<sup>59</sup> Fe	45 day	4.6 x 10 <sup>4</sup>	4.4 x 10 <sup>3</sup>	2.0 x 10 <sup>3</sup>	1.0 x 10 <sup>2</sup>	2.7 x 10 <sup>1</sup>			
<sup>58</sup> Co	72 day	1.5 x 10 <sup>5</sup>	1.0 x 10 <sup>4</sup>	4.6 x 10 <sup>3</sup>	3.3 x 10 <sup>2</sup>	6.6 x 10 <sup>0</sup>			
<sup>95</sup> Zr	65 day	1.1 x 10 <sup>-1</sup>	6.2 x 10 <sup>-3</sup>	2.9 x 10 <sup>-3</sup>	2.0 x 10 <sup>-4</sup>	7.2 x 10 <sup>-4</sup>			
<sup>65</sup> Zn	245 day	1.2 x 10 <sup>2</sup>	1.1 x 10 <sup>0</sup>	5.0 x 10 <sup>-1</sup>	6.7 x 10 <sup>-4</sup>	3.5 x 10 <sup>-5</sup>			
<sup>54</sup> Mn	~300 day	6.8 x 10 <sup>4</sup>	3.7 x 10 <sup>3</sup>	1.7 x 10 <sup>3</sup>	1.2 x 10 <sup>2</sup>	4.7 x 10 <sup>1</sup>			
<sup>55</sup> Fe	2.7 yr	1.3 x 10 <sup>6</sup>	1.5 x 10 <sup>5</sup>	6.7 x 10 <sup>4</sup>	3.5 x 10 <sup>3</sup>	7.2 x 10 <sup>2</sup>			
<sup>60</sup> Co <sup>(b)</sup>	5.27 yr	upper	9.6 x 10 <sup>5</sup>	9.3 x 10 <sup>4</sup>	4.7 x 10 <sup>4</sup>	2.5 x 10 <sup>3</sup>	7.5 x 10 <sup>1</sup>		
		lower	3.2 x 10 <sup>5</sup>	3.1 x 10 <sup>4</sup>	1.6 x 10 <sup>4</sup>	8.2 x 10 <sup>2</sup>	2.5 x 10 <sup>1</sup>		
<sup>63</sup> Ni	~100 yr	1.2 x 10 <sup>5</sup>	1.5 x 10 <sup>4</sup>	6.8 x 10 <sup>3</sup>	3.6 x 10 <sup>2</sup>	3.8 x 10 <sup>0</sup>			
<sup>93</sup> Nb	~3500 yr	3.6 x 10 <sup>-1</sup>	5.2 x 10 <sup>-2</sup>	2.4 x 10 <sup>-2</sup>	1.2 x 10 <sup>-3</sup>	1.3 x 10 <sup>-3</sup>			
<sup>14</sup> C	~5,750 yr	1.5 x 10 <sup>2</sup>	1.8 x 10 <sup>1</sup>	8.3 x 10 <sup>0</sup>	4.0 x 10 <sup>-1</sup>	1.9 x 10 <sup>-2</sup>			
<sup>94</sup> Nb	~20,000 yr	5.4 x 10 <sup>0</sup>	2.6 x 10 <sup>-1</sup>	1.2 x 10 <sup>-1</sup>	9.5 x 10 <sup>-3</sup>	--			
<sup>59</sup> Ni	~80,000 yr	7.4 x 10 <sup>2</sup>	1.3 x 10 <sup>2</sup>	5.0 x 10 <sup>1</sup>	3.0 x 10 <sup>0</sup>	3.2 x 10 <sup>-2</sup>			
Sum (Ci/m <sup>3</sup> )		2.97 x 10 <sup>6</sup>	3.07 x 10 <sup>5</sup>	1.45 x 10 <sup>5</sup>	7.73 x 10 <sup>3</sup>	9.04 x 10 <sup>2</sup>	2.97 x 10 <sup>6</sup>	2.97 x 10 <sup>6</sup>	
Average/Peak		0.755	0.637	0.778	0.637	0.637	0.003 x 4.74 <sup>(c)</sup>	0.08 x 4.74 <sup>(c)</sup>	
Ci/kg <sup>(d)</sup>		2.787 x 10 <sup>2</sup>	2.433 x 10 <sup>1</sup>	1.403 x 10 <sup>1</sup>	7.621 x 10 <sup>-1</sup>	7.164 x 10 <sup>-2</sup>	5.254 x 10 <sup>0</sup>	1.403 x 10 <sup>2</sup>	
Weight of Material (kg)		12,312	26,783	10,413	2,074	245,582	4,627	3,546	
Sum (Ci) <sup>(e)</sup>		3.431 x 10 <sup>6</sup>	6.516 x 10 <sup>5</sup>	1.461 x 10 <sup>5</sup>	1.581 x 10 <sup>3</sup>	1.759 x 10 <sup>4</sup>	2.431 x 10 <sup>4</sup>	5.534 x 10 <sup>5</sup>	
TOTAL - Radioactivity					4.826 x 10 <sup>6</sup> Curies				
					1.786 x 10 <sup>17</sup> becquerels				

TABLE 19. Footnotes

<sup>a</sup>Normalized to shroud

<sup>b</sup>Upper and lower bounds were computed using the maximum and minimum levels of <sup>60</sup>Co contaminant in the materials. All totals were computed using the upper bound values.

<sup>c</sup>Activity (Plate Average)=4.74. Activity (Shroud at Plate Location)=0.005, upper plate  
Activity(Plate Edge) Activity (Shroud at Axial Midplane) (0.08, lower plate)

<sup>d</sup>Conversion factor assumes stainless steel density of 8.038 x 10<sup>3</sup> kg/m<sup>3</sup> (0.29 lb/in.<sup>3</sup>).

<sup>e</sup>The number of significant figures carried is for computational accuracy and does not imply precision to four places.

Source: Excerpted from R.I. Smith, G.J. Konzek, and W.E. Kennedy, Jr., *Technology, Safety, and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station*, NUREG/CR-0130, Vol. 1, (Washington, D.C.: U.S. Nuclear Regulatory Commission, June 1978), Table 7.3-2.

**Table 20.**  
**Decommissioning Alternatives Practical with Onsite Waste Storage**

Decommissioning Alternative	Waste Storage Alternatives		
	1. LLW Stored Onsite	2. Spent Fuel Stored Onsite	3. Both LLW & Spent Fuel Stored Onsite
DECON	Partial DECON may be practical <sup>a</sup>	Partial DECON may be practical <sup>b</sup>	Partial DECON may be practical <sup>c</sup>
SAPSTOR	Practical	Practical	Practical
ENTOMB	Not practical	Not practical	Not practical

TABLE 20. Footnotes:

<sup>a</sup>Not analyzed in the report.

<sup>b</sup>This involves the conversion of the spent fuel pool to a facility for storage of the fuel, and the decontamination of the containment building and of other onsite structures not needed for fuel storage to levels that permit unrestricted use.

<sup>c</sup>Not analyzed in the report. This would be a combination of alternatives 1 and 2.

Source: Excerpted from G.M. Holter, E.S. Murphy, *Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station*, NUREG/CR-0130 Addendum 2, (Washington, D.C.: U.S. Nuclear Regulatory Commission, July 1983), Table 2.1

## Chapter Six

### National Non-Regulations and Non-Policies

*NRC, which has the responsibility on the commercial side, has not developed cost estimates, acceptable methods, or standards needed by industry to plan decommissioning or disposal of their facilities. NRC has not paid much attention to one of the biggest problems that may confront the public in the future—that is, who will pay the cost of decommissioning nuclear power reactors.*

—U.S. General Accounting Office, 1977 (1)

G.1

Although the NRC issued a proposed rule in February, 1985, on decommissioning criteria for nuclear facilities (2), the proposed rule does little to assuage the concerns reflected in the 1977 GAO report cited above. While the definition of decommissioning contained in the proposed rule requires the return of the property to unrestricted use, in fact, the content of the rule primarily establishes procedural guidelines for utilities to follow.

The Commission has avoided limiting acceptable methods of decommissioning or making choices among the financing alternatives available in order to assure that funds will be available when needed. The critical issue of the residual radioactivity level that will be allowed after decommissioning has been deferred to a separate rulemaking. Worse still, the procedural requirement to assure that environmental factors are considered fully has been significantly weakened. The proposed rule would no longer require the NRC to prepare an environmental impact statement for the decommissioning of reactors.

E.1

F.1

In the one area where the Commission is specific, the standard is woefully inadequate. The proposed rule specifies that utilities must have at least \$100 million (\$1984) available for decommissioning, an amount which Chapman predicts will only be sufficient to cover the entombment option. (3)

The proposed rule sets up the following procedural requirements:

1. In its application for an operating license, a utility must select a method for collecting decommissioning funds in accordance with a plan approved by the NRC as providing a "reasonable level of assurance" that funds will be available when needed, or "a certification that financial assurance for decommissioning will be provided in an amount at least equal to \$100,000,000 (1984 dollars) adjusted annually for inflation . . ." (Sec. 50.33(k)(1))

While the funding plan is to contain a cost estimate for

decommissioning, a description of the method of assuring funds, and a mechanism for adjusting cost estimates and funding levels over the life of the facility, no such requirements are attached to the certification option.

D.2.1(a)

Utilities may select prepayment, an external sinking fund, a surety method or insurance, an internal reserve (either segregated or unsegregated) or other funding methods providing comparable assurance. Only for single asset utilities, such as Maine Yankee with its one plant, does the Commission rule out internal funding.

2. About five 5 years prior to the projected end of the reactor's operating life, the utility is to "submit a cost estimate for decommissioning based on an up-to-date assessment of the actions necessary for decommissioning and, if necessary, plans for adjusting levels of funds assured for decommissioning." (Sec. 50.54 (cc)(4))

Assessment of specific actions is now to replace the earlier vague generalities about decommissioning. Given the current lack of experience with decommissioning large reactors and the lack of an independent assessment of the problems associated with decommissioning, this is likely to be the first time there is any realistic assessment of the cost of decommissioning. Who will pay if the NRC's \$100 million minimum proves to be far too low?

D.8.2.1

3. Utilities are to submit a "decommissioning plan" when they apply for authority to terminate their license. For reactors not yet terminated, the utility must submit a plan within two years following "permanent cessation of operations."

Here, at last, the NRC would require the licensee to choose an "alternative for decommissioning with a description of activities involved." (Sec. 50.82(b)(1)) Here, at the end of the reactor's useful life, the NRC wants the utility to address how it plans to protect "occupational and public health and safety." Here, finally, the Commission calls for an updated cost estimate for the chosen alternative for decommissioning and a "comparison of that estimate with present funds set aside for decommissioning . . ." (Sec. 50.82(b)(2)&(4))

A utility can elect to delay decommissioning "by including a period of storage or long-term surveillance" in its decommissioning plan. The proposed rule places no time restriction on the period of time these options will be allowed, even though discussion of the rule suggests 30-50 years will be adequate to significantly reduce radiation levels.

B.4.3

The NRC proposes to require that decommissioning funds be placed in a segregated fund outside the licensee's ad-

D.3.4

D.2.1(a)

D.3.4

ministrative control during the storage or surveillance period, unless the utility maintains a surety method or fund certification. (Sec.50.82(c)(1)) There is no discussion of the problems a utility may encounter in switching from an internal unsegregated fund where decommissioning monies have been invested in utility assets. There is no discussion of how to handle possible lack of available utility funds. In other words, the NRC does not start worrying about assuring that funds will be available for decommissioning until it could be too late.

minated.

The effectiveness of ALARA guidelines in protecting workers and the public is undercut by the cost to the utility of exceeding the regulatory requirement.(7) The NRC should set the standard itself at 10 millirems in order to protect the public, rather than depending on voluntary compliance with ALARA by the utilities.

E.1.1

Conclusion

D.3.2.1.1 (a)

By delaying the requirement for segregated funds until the end of a reactor's operating life, the NRC has not responded, even in spirit, to the concern embodied in the 1977 PIRG et al petition to the NRC that decommissioning funding be assured through the posting of bonds to be held in escrow. And instead of responding to GAO's concern that "the cost of decommissioning should be paid by the current beneficiaries, not by future generations,"(4) the NRC's proposed rule may mean that ratepayers will have to pay now and later.

The NRC's proposed rule is clearly inadequate from both an environmental and economic perspective, but it should please the Atomic Industrial Forum. AIF has stated in a recent decommissioning position paper that the federal government should not impose restrictions on utility decommissioning methods, cost estimates or financial policies.(6) The proposed rule gives AIF most of what it wants.

G.1

F.1

It is not until this stage that the NRC would have enough data to develop a meaningful EIS. Only then can utilities make the critical decision of when decommissioning should take place. At the time the NRC draws up an EIS, it must address the health and safety of workers and the public. This is when the public should be allowed to comment on the proposed decommissioning method and on available alternatives. Yet the NRC in its proposed rule downgrades the EIS requirement presently contained in 10 CFR 51.5 to an environmental assessment.

An environmental assessment does not require the in-depth examination of potential environmental, health and safety impacts required by an EIS. The assessment also avoids the EIS requirement that the NRC provide a draft version to other agencies and to the public for comment and then take these comments into consideration in preparing the final EIS.

Dissent by Asselstine and Bernthal

D.3.2.1.1. (a)

Commissioners James Asselstine and Frederick Bernthal are not satisfied with the allowance of internal unsegregated funds in the proposed rule. According to the discussion relating to the proposed rule they "continue to be concerned about the vulnerability of the internal funding mechanism for decommissioning funds, particularly where the funds are used to purchase assets or reduce existing debt . . . [They] would like public comments on the need to consider the possibility of insolvency and its impact on the continued availability of decommissioning funds."(5)

Residual Radiation Standards

E.1.1

Part 2 of the NRC's proposed rule-making is expected to amend 10CFR Part 20 to define the residual radioactivity levels that will be permitted at reactor sites released for "unrestricted use" following decommissioning. The NRC is expected to propose setting an upper limit of 50 millirems full body dose for annual exposure levels at such sites. The rule is also expected to require compliance with ALARA (As Low As Reasonably Achievable) guidelines of 10 millirems per year radiation levels before their operating licenses can be ter-

## Chapter Seven

### State Efforts: Too Little, Too Late, But Better Than Nothing

G.1 Since the NRC has been derelict in its responsibility to protect public health and safety by requiring utilities to set aside sufficient funds for decommissioning, the burden of planning for financing future decommissioning has fallen on the states, prodded by concerned citizens; but even this has been slow in coming. In cases where the utilities have taken on the task themselves, they have done so in ways to promote their own self-interest.

Because decommissioning represents a safety concern, as well as a cost recovery concern, state action alone is not sufficient. The NRC must set the standards which must be met. Strong national policy-making in this area is urgently needed.

#### What the States have Done

Today, 27 years after the beginning of utility ventures into nuclear power production, utilities in 4 out of 28 states with operating commercial reactors have still not collected any decommissioning funds for their reactors. Eleven nuclear utilities have waited for ten years or more after the startup of their nuclear plants before beginning to collect decommissioning money. Table 4 lists data on state-by-state decommissioning efforts.

In the majority of states where collection of decommissioning funds has been required, utilities are allowed to use internal unsegregated funding, described in Chapter 4 as "phantom funding" schemes. These funds, being collected for 55 reactors in 16 states, have provided more than \$500 million in internally generated funds for the utilities involved.

D.8.3.1 The majority of publicly owned systems and some private systems have avoided "phantom funding" and have instead selected internal segregated funding of decommissioning.

External sinking funds, the most stringent form, are now required in eight states—California, Colorado, Maine, Mississippi, Massachusetts, New Hampshire, Pennsylvania and Vermont. In New Hampshire and Mississippi the reactors to be covered by such funds are not in operation yet. In California, the requirement for external sinking funds is new, and the state's utilities have not yet been required to switch over to it.

What about state-level controls over cost estimates for decommissioning? As noted elsewhere, the cost estimates used in the utility industry vary widely. In some cases they are set at 10 percent of the cost of construction, following the lead of the Battelle PNL studies; in others, they are whatever a utility believes will be allowed. No state has yet made a final judgment on which decommissioning methods must be used.

Therefore, many utilities have been collecting decommissioning funds on the assumption that immediate dismantlement will be the method chosen. In fact, this decommissioning method may prove to be undesirable or unworkable for most companies.

Both state legislatures and state regulatory commissions have been involved in developing decommissioning policies for the private utilities. Maine established a state commission to study the problem and then submitted decommissioning legislation to the legislature. The commission's proposal subsequently passed. In other states such as Illinois (where Business and Professional People in the Public Interest proposed a bill to require the use of external sinking funding), citizen groups have lobbied to bring about changes in state policies.

D.8.3.1 State regulatory commissions have considered decommissioning both in specific rate cases and in 'generic' hearings on the issue. In rate cases, utilities themselves have requested permission to begin including decommissioning funds in their rates. Generally, the utilities making such requests reveal their tentative plans for decommissioning and the financing methods they will use. In many cases, this has opened up the issue for debate and prompted action by concerned ratepayers. In most states, the private utilities have fought hard for the use of unsegregated internal funding.

The nation's public power systems have generally preferred to finance decommissioning through internal segregated funding. Such recommendations made by their staff members to utility planning boards have been accepted without controversy. To date no public-owned system has formally considered the use of external sinking funds.

#### What Citizen Groups Have Done

Grassroots political battles over decommissioning have focused primarily on the financing methods involved, but also have touched on the decommissioning methods that will be allowed and on future legal liability for the costs. Local citizen groups have fought for the use of external sinking funding.

Successful state policy initiatives calling for external sinking funding are listed in Table 21. The table shows such policy initiatives occurring in eight states—California, Colorado, Maine, Massachusetts, Mississippi, New Hampshire, Pennsylvania, and Vermont. Citizen groups spearheaded successful efforts in California, Colorado and Pennsylvania.

In fact, this understates the amount of citizen activity on ex-

ternal sinking funding. Citizen pressure also indirectly helped to insure action by the legislature or the local public service commission in Massachusetts and Maine. Grassroots activity on the financing issue also preceded action by the Federal Energy Regulatory Commission, which brought about external sinking funding in Vermont. In Mississippi, FERC action largely brought about the external sinking fund mandated for the Grand Gulf 1 reactor.

Citizen groups in three states have focused organizing efforts on how reactors should be decommissioned. They have taken somewhat different positions on which of the three major decommissioning methods is suitable for reactors in their areas.

In Maine, for instance, Safe Energy for Maine (SEM) introduced legislation in 1981 to prohibit either the temporary storage or the entombment of the Maine Yankee plant. The measure did not pass, but may be reintroduced. SEM believes that Maine Yankee will be a safety liability until it is dismantled and removed from the reactor site.

In California, similarly, the Redwood Alliance is fighting Pacific Gas and Electric Co.'s decision to use temporary storage as the decommissioning method for the Humboldt Bay reactor. The Alliance believes it is irresponsible not to dismantle Humboldt Bay, especially given its location on an earthquake fault.

In Pennsylvania, however, Concerned Citizens for SNEC Safety is opposing the rapid dismantlement of the Saxton reactor by General Public Utilities. The Saxton reactor, operated by the Saxton Nuclear Experimental Corporation or SNEC, was shut down and placed in temporary storage years ago and is scheduled for dismantlement in 1987. Concerned Citizens fears that General Public Utilities is incapable of carrying out the work safely or at a reasonable cost. In 1983, the citizens group was successful in delaying the reactor's dismantlement for an additional 14 years, until 1997.

Citizen groups have also been concerned about the inequitable treatment of decommissioning costs: and again, different citizen organizations have defined the issue in different ways.

In California hearings on Humboldt Bay, for instance, the Redwood Alliance has challenged the proportions of decommissioning costs that are to be allocated to stockholders and ratepayers. The Alliance has argued that Pacific Gas & Electric waited ten years to begin collecting funds for Humboldt Bay's decommissioning, thereby unfairly burdening its current ratepayers. Accordingly, the group has fought in regulatory commission hearings to have decommissioning costs allocated to stockholders as well as ratepayers, through a three-to-one split.

In Vermont, the Vermont Yankee Decommissioning Alliance and the Vermont Public Interest Research Group argue ratepayers should pay 50 percent or less of decommissioning costs. A bill to divide Vermont Yankee's decommissioning expenses evenly between ratepayers and stockholders was introduced in the state legislature in 1983. The groups intend to pursue this policy again in future legislative sessions. In Pennsylvania, Concerned Citizens for SNEC Safety fought in 1983 for a delay in General Public Utilities' collection of decommissioning funds for Saxton.

Generally, citizen groups working on decommissioning have put pressure on their state public service commissions whenever possible and have turned to the legislative arena only when it becomes clear that the commissions are unfavorable to their perspectives and their concerns. Therefore, most decommissioning decisions to date have been handled in utility rate cases and in "generic" hearings on decommissioning.

Such efforts by citizen groups and state agencies to tackle the complexities of decommissioning are commendable. However, a state-by-state, case-by-case approach to decommissioning is no substitute for a coherent national policy on the subject—particularly when good state decommissioning policies stand in danger of being overruled at any time on the national level. To insure that the victories citizens have achieved at the state level will be preserved, while the irresponsible decommissioning policies adopted by utilities in some states are reversed, it is essential that responsible citizen organizations, lawmakers, and public officials work for adequate policy-making on decommissioning by the Nuclear Regulatory Commission.

Until the NRC adopts national decommissioning policies that assure adequate funding and protect workers and the public, the integrity of the decommissioning process will be threatened by utilities and the nuclear industry pursuing short-run objectives.

#### Footnotes, Chapter 7

1. U.S. General Accounting Office 1977.
2. U.S. Nuclear Regulatory Commission 1977.
3. Ibid.
4. U.S. House of Representatives 1977:411.
5. Atomic Industrial Forum 1983.
6. Ibid.
7. Schilling et al. 1979:2-33-34.
8. Ibid: 2-17.
9. Ibid: 2-16.
10. Dr. Carl Feldman (NRC), Personal Communication, 12 July 1983.
11. *Engineering News Record* 1984:26.

## External Sinking Funding Policy Initiatives for Commercial Nuclear Power Plants 1984

State	Pertinent Units	Year Enacted	Mechanism for Change		Supporter of Utility	PSC	Policy Citizen Group	Other
			Legislation	PSC Action <sup>b</sup> / FERC Action <sup>c</sup>				
CA <sup>d</sup>	All 6 Nuclear Plants	1983		X		X	X <sup>i</sup>	
CO	Ft. St. Vrain	1980		X		X	X	
ME <sup>e</sup>	Maine Yankee	1982	X					X <sup>k</sup>
MA	Yankee Rowe	1981			X	X		
	Pilgrim <sup>g</sup>	1983		X				
MS	Grand Gulf 1 and 2	1984			X			
NH <sup>e</sup>	Seabrook 1 and 2	1981	X				X <sup>j</sup>	
PA <sup>f</sup>	Salem 1	1978		X		X	X	X <sup>l</sup>
VT	Vermont <sup>h</sup> Yankee	1984			X		X	

TABLE 21. Footnote.

<sup>a</sup>External sinking funding is a financing mechanism which requires that funds for decommissioning are deposited in an account outside the utility's control, managed by an outside trustee and invested in non-utility assets.

Although not described in the table, external sinking funding policies have been proposed in a number of other states including: Arkansas (1981) state regulatory commission (PSC) hearings, Illinois (1984) legislation, Michigan (1979) PSC hearings, Minnesota (1980) PSC hearings, and Wisconsin (1982, 1983) legislation. Citizen groups initiated or supported efforts in all of these states, with the exception of Arkansas.

<sup>b</sup>PSC=Public Service Commission (or state regulatory commission). This agency regulates privately owned utilities on the state level.

<sup>c</sup>FERC=Federal Energy Regulatory Commission. This agency regulates all utilities involved in wholesale electricity sales.

<sup>d</sup>A final order had not yet been issued in this case of December 1984.

<sup>e</sup>Legislation also included a number of other provisions.

<sup>f</sup>This was a precedent setting case which led to the establishment of external sinking funding for all Pennsylvania utilities.

<sup>g</sup>Massachusetts Public Interest Research Group had supported legislation requiring external sinking funding prior to the state Department of Public Utilities order.

<sup>h</sup>Vermont Yankee Decommissioning Alliance and Vermont Public Interest Research Group supported legislation requiring external sinking funding prior to the FERC ruling.

<sup>i</sup>Redwood Alliance and others.

<sup>j</sup>James B. Walker, a citizen.

<sup>k</sup>Special State Legislative Committee.

<sup>l</sup>State Consumer Advocates Office.

Sources: CA—Nuclear Facility Decommissioning Costs, Cal. Pub. Util. Comm., Decision No. 83-04-013, 52 Pub. Util. Rep. 4th 618 (1983).

Personal Communication, Carl Zichella, Redwood Alliance, Arcata, CA, July 1, 1984.

CO—Public Service Co. of Colorado, Colo. Pub. Util. Comm., Decision No. C80 2346, 52 Pub. Util. Rep. 4th 225 (1981).

ME—Me. Rev. Stat. Ann. Tit. 35 Sec. 3355 (1983).

MA—Boston Edison Co., Mass. Dept. of Pub. Util. Comm., Docket No. 1350, 53 Pub. Util. Rep. 4th 349 (1983).

Yankee Atomic Electric Co., 15 FERC Stat. 63, 017 (1981).

MS—Abville Smith Ferry Inc., 26 FERC Stat. 63, 044 (1984).

NH—NH Rev. Stat. Ann. Sec. 162-F:19-21 (1981).

PA—Penn. Public Utilities Comm. v. Philadelphia Elec. Co., Penn. Pub. Util. Comm., Docket No. RID-428 (1978).

VT—FERC Letter Order Approving Settlement Agreement (Unpublished), Vermont Yankee Nuclear Power Corp., FR 83 342, 343, April 3, 1984.

*Appendix A*  
**Public Citizen's 1984 Decommissioning Survey**

The Public Citizen Decommissioning Policy Survey explored recent developments in decommissioning policy and examined critically the implications of "de facto" policy-making by the utility industry.

The author collected this data for the first time in 1981, as part of work for the University Research Group on Energy (URGE) at Cornell University. Although published in aggregate form in an URGE monograph in 1982, none of the information obtained in the survey has ever been collected on a plant by plant basis and made available before.

The questionnaire used in the survey consisted of seven questions covering three major policy areas: decommissioning cost estimates, decommissioning financing methods, and decommissioning procedures. Data entries for these questions were collected through a several-step process. First, the questionnaire was sent to the principal nuclear utilities. Then addi-

tional data was collected through follow-up phone calls to most of the utilities. The author was unable to obtain data from the Philadelphia Electric Company.

Further information was obtained from conversations with utility staffers, state utility commission staff and employees of the Federal Energy Regulatory Commission (FERC). During a five-month period from January to May of 1984, additional telephone calls were made to utilities and regulatory commissions to clarify information that had been received previously.

The survey collected data on 87 of the nation's 89 licensed reactors. For these reactors, it achieved a response rate of 100 percent. However, the survey did not obtain data on the LaSalle 2 and WPPSS 2 reactors, since they were not yet operating, making such information difficult to obtain. In addition some decommissioning cost estimates provided by utilities lacked sufficient detail.

**1984 Utility Decommissioning Policy Questionnaire**

Please answer each question where applicable for each individual plant owned or partially owned by your utility.

1. Have your company's decommissioning policies or cost estimates been changed since January 1982 other than to account for inflation? If so, please describe these changes.

2. Please describe the study or methods used by your company to determine decommissioning cost estimates, financing mechanisms and tentative type of decommissioning planned.

3. What are the estimated costs of decommissioning the plant (in 1984 dollars) for each method considered? Please list estimated costs by method.

4. How often are the cost estimates currently updated? Please distinguish between updating to account for inflation and complete revision for estimates.

5. What decommissioning method is currently assumed for ratemaking purposes? If different, what decommissioning method is currently scheduled for the plant?

6. What financing mechanism is currently being used to accrue funds? Please be as specific as possible in describing whether monies are held internally or externally.

7. What funds have been accrued to date for decommissioning? Please specify by unit or in aggregate for all units.

8. What year will the plant's operating license expire?

Joseph Benish  
Keith Berry  
Don Bigue  
Robert C. Brown  
Rosemary Bruster  
Bill Carter  
Gary Connett  
Dick Daven  
James Durrell  
Roger Dyer  
Jim Elliott  
J.H. Francis  
Ben Garrett  
Carl Green  
Tom Grooms  
John Hasslebring  
Dan Hoppe  
Brad Johnson  
Ira Kaplan  
Vince La Barbera  
Rodney Larson  
Bob Lathem  
R.H. Leasburg  
John Marcel  
Bill Marshall  
Richard Marshall  
Mike Maur  
Bill Mc Gee  
Dick Mc Gaughey  
Terry Mc Keighan  
Ben Melton

George Metzger  
Fred Miller  
Neil Palmer  
Denise Parrish  
Carl Patrick  
Candy Patten  
David Patten  
John Pearson  
Dennis Pooler  
David Porter  
Sam Powers  
Robert Rosenthal  
Myra Shaunessy  
Robert Shaw  
Doug Short  
Richard Shimshak  
Larry Shriner  
Tim Simonson  
Jay Stewart  
William Stimart  
Charles Stults  
Jim Tascas  
Brad Thomas  
Gene Trouba  
Alfred Ueberroth  
Nelson Updaw  
John Varner  
Ray Vawter  
Dan Vollum  
Randy Watts

Appendix B  
Licensed Commercial Nuclear Power Plants 1985

State	Unit	Companies Involved	Ownership %	Commercial Operation	Name Plate Rating (MWE)	Unit Type (a)	
AL	Farley 1	Southern Co. *	100.0	12/77	860.0	P	
	Farley 2	Southern Co. *	100.0	7/81	860.0	P	
	Browns Ferry 1	Tennessee Valley Auth. *	100.0	3/74	1067.0	B	
	Browns Ferry 2	Tennessee Valley Auth. *	100.0	3/74	1067.0	B	
	Browns Ferry 3	Tennessee Valley Auth. *	100.0	3/77	1067.0	B	
AR	Ark. Nuclear 1	Middle South Utilities	100.0	12/74	850.0	P	
	Ark. Nuclear 2	Middle South Utilities	100.0	3/80	912.0	P	
CA	Humboldt Bay (c)	Pacific Gas & Elec. Co. *	100.0	3/63	65.0	B	
	Diablo Canyon 1	Pacific Gas & Elec. Co.	100.0	3/84	1084.0	P	
	Rancho Seco	Sacramento Municipal Utility District *	100.0	4/75	918.0	P	
	San Onofre 1 (c)	Southern Cal. Edison Co. *	80.0	1/68	436.0	P	
	San Onofre 2	San Diego Gas & Elec.	20.0				
		Southern Cal. Edison Co.	75.0	8/83	1100.0	P	
		San Diego Gas & Elec. Co.	20.0				
	San Onofre 3	Riverside Public Util.	1.8				
		Anaheim Elect. Div.	3.2				
		Southern Cal. Edison Co. *	75.0	1/84 (d)	1100.0	P	
San Diego Gas & Elec. Co.		20.0					
CO	Ft. St. Vrain 1	Riverside Public Util.	1.8				
		Anaheim Elect. Div.	3.2				
CT	Connecticut Yankee	Public Serv. Co. of Colorado *	100.0	1/79	330.0	H	
	Millstone 1	Conn. Yankee Atomic Pwr Co. *	100.0	1/68	582.0	P	
CT	Millstone 2	Northeast Utilities	100.0	12/70	660.0	B	
	Millstone 2	Northeast Utilities	100.0	12/75	869.0	P	
FL	Crystal River 3	Fla. Pwr. Corp. *	90.0	3/77	880.0	P	
		Seminole Elec. Coop.	1.7				
		Orlando Util. Comm.	1.6				
		Others	6.7				
	Turkey Point 3	Fla. Pwr. & Lt. Co. *	100.0	12/72	660.0	P	
	Turkey Point 4	Fla. Pwr. & Lt. Co. *	100.0	9/73	660.0	P	
St. Lucie 1	Fla. Pwr. & Lt. Co. *	100.0	12/76	822.0	P		
	Fla. Pwr. & Lt. Co. *	100.0	5/83	786.0	P		
GA	Edwin I. Hatch 1	Southern Co.	50.1	12/75	750.0	B	
	Edwin I. Hatch 2	Oglethorpe Elec. Mem. Corp.	30.0				
IL	Dresden 1 (c)	Mun. Elec. Authority of GA	17.7				
		City of Dalton, GA	2.2				
		Southern Co.	50.1				
	Dresden 2	Oglethorpe Elec. Mem. Corp.	30.0	9/79	790.0	B	
		Mun. Elec. Auth. of Ga.	17.7				
		City of Dalton, GA.	2.2				
	Dresden 3	Commonwealth Ed. Co. *	100.0	8/60	207.0	B	
		Commonwealth Ed. Co. *	100.0	8/70	794.0	B	
	Zion 1	Commonwealth Ed. Co. *	100.0	10/71	794.0	B	
	Zion 2	Commonwealth Ed. Co. *	100.0	10/73	1040.0	P	
Quad Cities 1	Commonwealth Ed. Co. *	100.0	9/74	1040.0	P		
	Commonwealth Ed. Co. *	75.0	8/72	789.0	B		
Quad Cities 2	Iowa-Il. Gas & Elec. Co.	25.0					
	Commonwealth Ed. Co. *	75.0					
La Salle 1	Iowa-Il. Gas & Elec. Co.	25.0	10/72	789.0	B		
	Commonwealth Ed. Co. *	100.0	10/82 (d)	1078.0	B		
IA	Duane Arnold 1	Iowa Elec. Lt. & Pwr. Co.	70.0	2/75	538.0	B	
		Central Iowa Pwr. Coop	20.0				
		Corn Belt Pwr. Coop	10.0				

State	Unit	Company Involved	Ownership %	Commercial Operation	Name Plate Rating (MWE)	Unit Type (a)
ME	Maine Yankee	Maine Yankee Atomic Pwr Co. *	100.0	12/72	825.0	P
MD	Calvert Cliffs 1	Baltimore Gas & Elec. Co. *	100.0	5/75	845.0	P
	Calvert Cliffs 2	Baltimore Gas & Elec. Co. *	100.0	4/77	845.0	P
MA	Pilgrim 1	Boston Edison Co. *	100.0	12/72	670.0	B
	Yankee Rowe	Yankee Atomic Elec. Co. *	100.0	7/61	175.0	P
MI	Big Rock Pt. 1	Consumers Pwr. Co. *	100.0	3/63	63.0	B
	Palisades 1	Consumers Pwr. Co. *	100.0	12/72	757.0	P
	Donald C. Cook 1	American Electric Power Co. *	100.0	7/61	1730.0	P
	Donald C. Cook 2	American Electric Power Co. *	100.0	7/78	1700.0	P
MN	Monticello 1	Northern States Pwr. Co. *	100.0	6/71	845.0	B
	Prairie Island 1	Northern States Pwr. Co. *	100.0	12/73	530.0	P
	Prairie Island 2	Northern States Pwr. Co. *	100.0	12/74	530.0	P
MS	Grand Gulf 1 (d)	Middle South Energy Corp.	100.0	7/84 (d)	1250.0	B
NE	Cooper	Nebraska Pwr. Pub. Dist. *	100.0	7/74	775.0	B
	Fort Calhoun 1	Omaha Pub. Pwr. Dist. *	100.0	9/73	466.0	P
NJ	Oyster Creek Salem 1	General Public Utilities	100.0	12/69	650.0	B
		Public Serv. Elec. & Gas. *	80.0	6/77	1190.0	P
		Atlantic City Elec. Co.	10.0			
	Salem 2	General Public Utilities	10.0			
		Public Serv. Elec. & Gas. *	80.0	10/81	1190.0	P
Atlantic City Elec. Co.	10.0					
NY	Indian Pt. 1 (c)	Consolidated Edison Co. *	100.0	1960	275.0	P
	Indian Pt. 2	Consolidated Edison Co. *	100.0	8/73	873.0	P
	Indian Pt. 3	Pwr Authority St. of NY *	100.0	8/76	965.0	P
	FitzPatrick	Pwr Authority St. of NY *	100.0	7/75	821.0	B
	Nine Mile Point 1	Niagara Mohawk Pwr. Corp. *	100.0	12/69	620.0	B
	Ginna 1	Rochester Gas & Elec. Co. *	100.0	10/86	470.0	P
NC	Brunswick 1	Carolina Pwr. & Lt. Co. *	81.7	3/77	790.0	B
		N.C. Eastern Muni.	18.3			
	Brunswick 2	Carolina Pwr & Lt. Co. *	81.7			
		N.C. Eastern Muni.	18.3	11/75	790.0	B
	McGuire 1	Duke Pwr. Co. *	100.0	12/81	1180.0	P
McGuire 2	Duke Pwr. Co. *	100.0	3/84 (d)	1180.0	P	
OH	Davis-Besse 1	Toledo Edison Co. *	49.0	11/77	890.0	P
		Cleveland Elec. Illum. Co.	51.0			
OR	Trojan 1	Portland Gen. Elec. Co. *	64.5	5/76	1230.0	P
PA	Beaver Valley 1	Duquesne Lt. Co. *	47.5	10/76	833.0	P
		Ohio Edison Co.	35.0			
	Three Mile Is. 1 (c)	General Public Utilities *	50.0	9/74	819.0	P
		Jersey Central Pwr. & Lt. Co.	25.0			
	Three Mile Is. 2 (c)	Pennsylvania Elec. Co.	25.0			
		General Public Utilities *	50.0	12/78	906.0	P
		Jersey Central Pwr. & Lt. Co.	25.0			
Susquehanna 1	Pennsylvania Elec. Co. *	25.0				
Pennsylvania Pwr. Co. *	90.0	6/83	1050.0	B		
Allegheny Elec. Coop.	10.0					

State	Unit	Companies Involved	Ownership %	Commercial Operation	Name Plate Rating (MWE)	Unit Type (a)
PA	Peach Bottom 2	Phil. Elec. Co.	42.4	7/74	1065.0	B
		Pub. Serv. Elec. & Gas Co. *	42.4			
	Peach Bottom 3	Delmarva Pwr. & Lt. Co. *	7.6	12/74	1065.0	B
Atlantic City Elec. Co.		7.6				
Phil. Elec. Co.		42.4				
Shippingport	Delmarva Pwr. & Lt. Co. *	7.6	12/57	72.0	L	
		Atlantic City Elec. Co.				7.6
	U.S. Dept. of Energy *	100.0				
SC	H.B. Robinson 2	Carolina Pwr. & Lt. Co. *	100.0	3/71	665.0	P
		Duke Pwr. Co. *	100.0	7/73	860.0	P
	Oconee 1	Duke Pwr. Co. *	100.0	9/72	860.0	P
	Oconee 2	Duke Pwr. Co. *	100.0	12/72	860.0	P
	Summer 1	S.C. Elec. & Gas Co. *	67.0	11/82	900.0	P
		S.C. Public Serv. Auth.	33.0			
TN	Sequoyah 1	Tennessee Valley Auth. *	100.0	7/81	1148.0	P
	Sequoyah 2	Tennessee Valley Auth. *	100.0	6/82	1148.0	P
VT	Vermont Yankee	Vt. Yankee Nuclear Pwr. *	100.0	11/72	514.0	B
VA	Surry 1	Virginia Elec. & Pwr. Co. *	100.0	12/72	775.0	P
		Virginia Elec. & Pwr. Co. *	100.0	5/73	775.0	P
	Surry 2	Virginia Elec. & Pwr. Co. *	100.0	6/78	877.0	P
	North Anna 1	Virginia Elec. & Pwr. Co. *	100.0	12/80	890.0	P
WA	Hanford-N	U.S. Dept. of Energy	100.0	9/66	860.0	G
WI	LaCrosse	Dairyland Pwr. Coop. *	100.0	11/69	50.0	B
	Point Beach 1	Wis. Elec. Pwr. Co. *	100.0	12/70	497.0	P
	Point Beach 2	Wis. Elec. Pwr. Co.	100.0	10/72	497.0	P
	Kewaunee 1	Wis. Pub. Serv. Corp. *	41.2	6/74	535.0	P
		Wis. Pwr. & Lt. Co.	41.0			
		Madison Gas & Elec. Co.	17.8			

#### Footnotes

Designates principle unit owners, or units for which data was collected to date.

\*This table includes both inoperable reactors and plants with low or full power licenses not yet commercial. WPPSS 2 and La Salle 2, both in this category are not included.

<sup>b</sup>B= Boiling Water Reactor  
P= Pressurized Water Reactor  
H= High Temperature Gas-cooled Reactor  
G= Graphite Reactor  
L= Light Water Breeder Reactor

<sup>c</sup>This unit is inoperable.

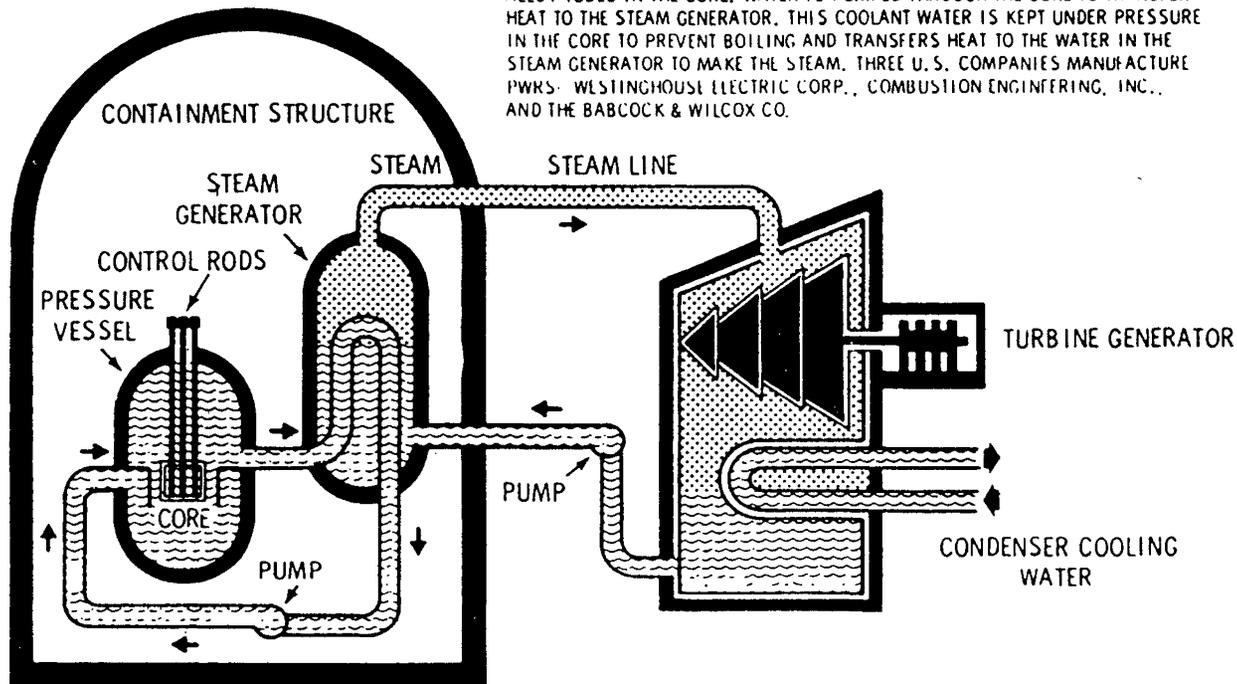
<sup>d</sup>This unit does not yet have a commercial operating license. The date listed is either the date a lower-power operating license or a full-power license was issued.

Source: Atomic Industrial Forum, "Nuclear Power Plants in the United States--January 1, 1984" (Bethesda, MD: Atomic Industrial Forum, 1984).

Appendix C  
 Diagram of a Pressurized Water Reactor Vessel

PRESSURIZED WATER REACTOR (PWR)

PRESSURIZED WATER REACTOR (PWR). AS WITH THE BOILER IN A COAL-, OIL-OR GAS-BURNING POWER PLANT, A NUCLEAR POWER REACTOR PRODUCES STEAM TO DRIVE A TURBINE WHICH TURNS AN ELECTRIC GENERATOR. INSTEAD OF BURNING FOSSIL FUEL, A REACTOR FISSIONS NUCLEAR FUEL TO PRODUCE HEAT TO MAKE THE STEAM. THE PWR SHOWN HERE IS A TYPE OF REACTOR FUELED BY SLIGHTLY ENRICHED URANIUM IN THE FORM OF URANIUM OXIDE PELLETS HELD IN ZIRCONIUM ALLOY TUBES IN THE CORE. WATER IS PUMPED THROUGH THE CORE TO TRANSFER HEAT TO THE STEAM GENERATOR. THIS COOLANT WATER IS KEPT UNDER PRESSURE IN THE CORE TO PREVENT BOILING AND TRANSFERS HEAT TO THE WATER IN THE STEAM GENERATOR TO MAKE THE STEAM. THREE U.S. COMPANIES MANUFACTURE PWR'S: WESTINGHOUSE ELECTRIC CORP., COMBUSTION ENGINEERING, INC., AND THE BABCOCK & WILCOX CO.





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Note: The author has used the Lovins and Lovins method of referencing in writing the notes and bibliography for this report. As they explain:

*The references are listed under the surname of the senior author or (failing that) the name of the publication or organization. Listings are alphabetical in the form cited: if in doubt, look for organizational listings under both name and common abbreviation. Listings under the same surname or equivalent are chronological, not alphabetical by initials Jones, Z. 1975 comes before Jones, A. 1980. Listings are repeated by a dash, which refers to the name or names most recently listed, thus in Jones, A. 1975 — 1976 — & Smith, B 1972 — 1981 the last listing refers to Jones & Smith 1981, not to Jones alone.*



HANNAH L. KATZ, M.D.  
P.O. Box 427, Rutgers Branch  
Croton-on-Hudson, N.Y. 10521

OFFICE NUMBER  
ENROLLED RULE PR-30,40,50,51,70,72  
(50 FR 5600) (11)

5/3/85

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

DOCKETED  
USNRC

'85 MAY -8 A9:33

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Sir:

I am greatly concerned about the "Decommisioning  
Criteria for Nuclear Facilities";

The decommissioning of a nuclear power plant  
requires possibly more know-how, caution, responsibility,  
time, and money than the building of it.

I understand that you figured the cost of decom-  
missioning one plant at approx. \$100 million. Most likely,  
the cost will be much higher. I, therefore, urge you to  
work for a realistic, solid funding basis that would  
enable the NRC to completely decommission nuclear  
facilities, with the fullest possible protection of the health  
and lives of the workers.

Sincerely,

Hannah L. Katz.

G.1

D.1.1.1

G.14

ACKNOWLEDGED BY CARD... MAY -8 1985 pd

PK-30,40,50,51,70,72  
RAY F. SMITH (50 FR 5600) (12)  
34 Chestnut Drive  
Hastings on Hudson, New York 10706  
May 4, 1985  
DOCKETED  
USNRC

'85 MAY -8 10:22

Secretary of the Commission  
US. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH  
Attn: Docketing and  
Services Branch

Dear Sir:

With reference to the rule on "De-commissioning Criteria for Nuclear Facilities," I write with particular concern about the funding methods. In my opinion, the prepayment method is clearly the only one that adequately protects the public's interest, because only that method assures that funds are set aside to be available when needed.

D. 3. 2. 2. 1

It seems to me that if nuclear power were to pay its way fairly, with appropriate safeguards, including financial ones, for the public, the controversy about it would be minimized, and the issue would be resolved in a fair and equitable manner.

D. 3. 2. 1. 1 (a)

I urge you to approve only the pre-payment method.

Sincerely,  
Ray F. Smith  
Acknowledged by card... MAY - 8 1985 pd

REGISTRATION NUMBER PR-344450, 51, 70, 72  
PROPOSED TITLE (50FR 5600) (13)

1824 Lake Street  
San Francisco CA 94121  
May 3, 1988

US Nuclear Regulatory Commission  
Washington DC 20555

'85 MAY -8 AIO:23

To the Commission -

Your consideration of the problem of decommissioning nuclear facilities requires as much thought and concern for the safety of the public as does licensing. The extreme hazard posed by radioactive materials necessitates the assurance of an eternal vigilance in their disposal.

My understanding of 50 Fed. Reg. 5600 - Decommissioning Criteria for Nuclear Facilities is that there has not been sufficient attention paid to many facets of the problem.

First, the three options are not equal, nor are the instructions for carrying out the decommissioning method selected spelled out. With my experience in the building of the Diablo Canyon reactor, I know you cannot leave anything to the judgement of the utility involved. I would think you would know that by now! Stringent guidelines must be adopted to ensure the safety of the public over thousands of years.

Quality assurance and security control must be spelled out for all decommissioning procedures. Intermediate and low-level waste must be considered as well as high-level waste.

G.1

C.1.3

C.6

H.1.1.1

Funding for decommissioning must be set aside in some sort of escrow before the plant is allowed to begin operation. Early failure - such as that at TH1 - might necessitate early decommissioning and funds must be available.

D.3.2.2.1

I urge you to refine your regulations, make them more stringent on the utility, more specific in addressing all the problems involved, and being constantly aware of your responsibility for protection of public health and safety.

G.1, D.8.1

Sincerely,

Barbara Levy

PR-30, 40, 50, 51, 70, 72 (14)  
RULE (50 FR 5600)

1615 Canbelle ~~TRIST~~ RD  
Ortanna, PA 17353  
May 85 1985-8 AIO:26

OFFICE OF SECY:  
DOCKETING & S'  
BRANCH

Dear Sirs:

I wish to comment on the February proposal for a rule on the decommissioning of nuclear facilities

I think that utilities should be required to set aside money for decommissioning costs beginning on the first day of plant use. The amount to be set aside should be determined by a percentage of the original construction costs, since larger, more complex, more expensive plants are likely to cost more to dismantle than smaller, simpler plants. A flat \$100 million is not likely to be appropriate for every facility and may indeed be too little for most.

D.3.2.2.1

D.1.1.1

D.2.1(a)

Acknowledged by card... MAY 8 1985

The decommissioning funds should not be mingled with other company assets. In the case of my utility Met-Ed/GPU, I believe any loose change is being used to pay clean-up costs of Unit 2 at TMI. If unsegregated decommissioning funds were available for Unit I that money, too, might be spent during this financial crisis.

D.3.2.1.1(a)

I'm glad the rule seeks unrestricted use of the facility's site after decommissioning. But I think allowing residual radiation of 50 millirems is too high when lower levels can be attained.

E.1.1

If a site is to be released for unrestricted use, then it is fair to ask that the whole decommissioning process be subjected to environmental impact statement process concerning public participation in the health, safety and environmental aspects of the decommissioning plans. The easier route of "environmental

F.1

assessment" is not appropriate.

Thank you for your consideration  
of these views.

F.1

Yours truly,  
Jerry Depew

DOCKET NUMBER PR-34,40,50,51,70,72  
PROPOSED RULE (50 FR 5600) (15)

Peter A. Mitchell  
121 Edgerton St.  
Rochester, N. Y. 14607  
716 442-2929

May 5, 1985

'85 MAY -8 10:32

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555  
Attn: Docketing and Service Branch

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Ref: NRC Proposed Decommissioning Rules Ref: #50 Fed. Reg. 5600, 2/11/85

I am submitting comments on the NRC proposed decommissioning rules and suggesting changes that I believe to be necessary to achieve adequate protection of public health and safety for present and future generations, proper protection of employees involved in the decommissioning of nuclear facilities, and assurances of adequacy and availability of funding.

G.1

D.8.1

Public Health and Safety protection for Present and Future Generations

Entombment should be specifically ruled out as a decommissioning option. All radionuclides should be removed from the site so that safe public and private site use can be guaranteed. Sites should be restored in such manner that ground water, soil, and air are free of radioactive contamination. The NRC should compile, organize, and evaluate all available information and experience on decommissioning and then develop recommendations and guidelines for the DECON and SAFSTOR methods of decommissioning. The NRC should develop decommissioning regulations to ensure that utilities and industry approach decommissioning in a manner that protects the public and employees health, welfare, and over-all well-being. NRC decommissioning safety inspectors should be assigned to all facilities undergoing decommissioning. Decommissioning standards should also include clear definitions of high level and low level radioactive waste and disposal procedures.

B.5

E.1.1

G.10.2

C.1.3

G.15

H.1.1.1

Proper protection of employees involved in decommissioning of nuclear facilities

The NRC should develop procedural standards and requirements that result in minimal worker exposure to radiation. A review of all previous radiation exposure for workers involved in decommissioning work should be required and tight records on exposure received should be kept on all decommissioning workers.

C.1.8.1

C.1.10

Acknowledged by NRC MAY - 8 1985 PA

Assurances of Adequacy and Availability of Funding

Decommissioning costs estimates should be based on available current and past experience both here and abroad and reviewed accordingly as more experience is gained. Based on the Shippingport experience, a cost estimate of \$100 million appears woefully inadequate for reactors of 500 to 1000 MW size. The 72 MW Shippingport reactor evidently is expected to cost \$98 million to decommission. However, not only is it approximately 1/14th the Megawattage of modern reactors, it also has the cost advantages of having its radioactive waste deposited at the Federally owned Hanford waste dump (at the taxpayers expense). Another cost saving unavailable to almost all operating reactors is the small size of the reactor vessel which permits removal and shipment intact rather than under water dismantlement through torch cutting. Decommissioning costs will obviously be far greater than the projected \$100 million in 1984 dollars.

D.1.1.1

Since the future financial viability of utilities cannot be ensured, it becomes very important that adequate funds to cover decommissioning costs be set aside in the present, segregated from all other utility functions and financial activities. These funds should be segregated in such manner that they remain protected from creditors in case of utility bankruptcy.

D.3.2.2.1

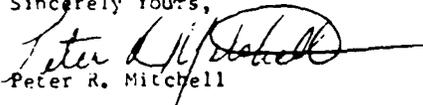
D.3.2.1.1(a)

In Conclusion

These suggested procedures for ensuring protection of public and employee health and welfare for present and future generations are logical and reasonable and should not be compromised or weakened due to political expediency and industrial pressure. The NRC has a solemn obligation to regulate and protect, and I expect the NRC to fulfill its charter with the American people.

G.1

Sincerely Yours,

  
Peter R. Mitchell

PR-84-4, 67, 51, 70, 72 (16)  
(50 FR 5600)

Mrs. Campbell H. Steketee  
6220 Tahoe Drive S.E.  
Grand Rapids, Michigan 49506

May 2, 1985  
BOLKETEES  
USNRC

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKET NUMBER

Dear Sir:

I am writing regarding your proposed rule for decommissioning reactors. Although there should be immediate action on these regulations, I cannot agree with the rules that you propose.

G.1

Any rules for the ultimate disposal of nuclear plants and their radioactive waste must clearly state whose responsibility this is and how this disposal will be financed. This should include cost estimates as well as acceptable methods and standards. Unsegregated decommissioning funds are totally unacceptable.

D.8.2.1

C.1.3

D.3.2.1.1(a)

Thank you for your consideration  
Sincerely,

Mary Louise Steketee

Acknowledged by card... MAY - 8 1985

TICKET NUMBER  
PROPOSED RULE PR-30,40,50, et al  
(50 FR 5600) (17)



Back Fields Farm · Eliot, Maine

Silas & Constance Weeks  
207 - 439-2837

DOCKETED  
USNRC

'85 MAY -9 AM 1:50

OFFICE OF SECURITY  
DOCKETING & SERVICE  
BRANCH

We must require pre-  
payment of decommissioning  
costs by builders of nuclear  
plants.  
There should be an inde-  
pendent study of decommis-  
sioning costs by the  
Congressional office of  
technology assessment.  
Strengthening of utility  
liability for decommis-  
sioning must be legis-  
lated.

D.3.2.2.1

G.16.

D.8.2.1

ACKNOWLEDGED BY CARD..... MAY 15 1985 *fb*

Proper residual radiation level must be set -  
We must plan for the safe long term disposal of our nuclear wastes. Environment is not safe.

E.1.1

H.1.1.1

B.5

Sincerely,  
Constance G. Weeks  
14 Odianola  
Eliot  
Me 03903

north carolina  
public interest research group

704 1/2 Ninth Street  
P.O. Box 2901  
Durham N.C. 27705

ADAMS NUMBER  
PROPOSED RULE PR-38, 40, 50 et al (18)  
(50 FR 5600)

DOCKETED  
USNRC

(919) 286-2275 in Durham

'85 MAY -9 AM 1:42

May 7, 1985

OFFICE OF DECISION  
DOCKETING & SERVICE  
BRANCH

JOINT COMMENTS OF N.C. PIRG AND WELLS EDDLEMAN ON

"DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES" 50 FR 5600

This proposal is seriously deficient on almost all counts. One obvious problem is allowing the use of unsegregated funds for decommissioning. Electric utilities in particular tend to invest such funds in plant, which is not readily convertible into cash and which may not preserve its value over time. External sinking funds must be required of all licensees in order to provide adequate funding for decommissioning activities. These funds must be adequate to meet the cost of decommissioning in realistic terms, not just an estimate made at the time of licensing or an update near the end of the life of a facility. Cost estimates should be updated at least every two years, and any real increase in costs should be fully funded. The NRC's experience with low cost estimates for the completion of nuclear reactors should be clear evidence of why estimates made at the time of initial licensing cannot be relied on: cost overruns of 400, 500, even 1000 percent have occurred.

Since every nuclear facility will need decommissioning, no licensee should be allowed to use the "asset" of one nuclear facility to fund decommissioning of others. These "assets" are not readily convertible into cash (e.g. GPU Nuclear did not sell its operable nuclear plants to clean up Three Mile Island), and will require their own decommissioning funds. Such a provision invites a shell game and underestimation of the real costs of decommissioning.

D.3.2.1.1(a)

D.4.3

D1.1.1

D.3.2.1.1(a)

acknowledged by card..... MAY 15 1985 *pd*

Underestimation of real costs also invites adverse health consequences for decommissioning workers, and adverse environmental effects from inadequate or sloppy decommissioning. The history of decommissioned nuclear test reactors and similar facilities reveals that many have had to be cleaned up more than once; the cost of such repeat cleanups can include disposal of much larger quantities of contaminated material than the original "decommissioning".

Unfortunately, the Commission's proposed rules for what decommissioning shall do are so vague as to lend little guidance to licensees. Instead, the Commission appears to give them license to make inadequate plans and not provide adequate cleanup. Since licensees, particularly those of weak finances and those which are regulated utilities, have every incentive financially to underestimate or defer such costs, the Commission is asking for irresponsibility from the nuclear industry in failing to enact strong standards now.

The Commission should enact regulations that clearly require comprehensive planning for decommissioning during construction, including addressing the specific radionuclides likely or able to be formed or found in various components, monitoring provisions to establish the level of radionuclides during operation (so as to know what nuclides will have to be dealt with in decommissioning) and providing that all 10 CFR 50 quality assurance requirements cover both the planning (which must begin during construction if not before, in order to adequately address the components being used in any nuclear facility and their likely contaminants), the monitoring, and the actual decommissioning of all nuclear facilities.

These criteria should also provide for independent health physics and occupational health monitoring of all decommissioning activities; keeping of health registers of all workers involved, including those involved in transporting materials from decommissioned facilities and others who work with such materials; requirements to minimize radiation exposure to both workers and the environment during and after decommissioning, including a specific ALARA standard with dose guidelines minimizing such exposure; and steps to minimize genetic effects, e.g. by not employing anyone in decommissioning who is going to have further children after beginning such work.

All reactor internals and other irradiated material containing isotopes which are either long-lived (over 25 years) or intense emitters should be required to be disposed of as high-level wastes. Any materials removed by solvents, chelating agents, liquids, etc should have all their toxic or radioactive components stabilized on-site before being moved to any storage or disposal site. Shallow land burial of all radioactive wastes or materials from decommissioning should be banned by rule -- landfills leak.

The definition of "decommission" in 10 CFR 30.4(y) (proposed) is inadequate and should at least provide that unrestricted use of the site shall be safe, that all contaminants above 10 CFR 20 limits be removed from the site (at least -- more should be removed if feasible -- the ALARA standard is a minimal one to use; the goal should be to remove all radioactive contamination from the site).

The dollar limits on decommissioning in 10 CFR 30.34 and 30.35 are too low and should be escalated with inflation and with the real-dollar increase (if any -- there may be a great deal) in decommissioning costs. The requirements should also include a bond by all licensees for full decommissioning and cleanup costs following an accident at least as severe as has ever occurred in a similar facility anywhere in the world. This would provide financial assurances consistent with the Atomic Energy Act's requirement for financial qualifications,

D.1.1.2

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D.2.1(c)

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for cases of "premature decommissioning" such as Three Mile Island unit 2. The provision for covering accidents at least as severe as the worst that has already occurred is probably too conservative, but it would act to put financial responsibility for the consequences of accidents (and safeguarding the public and environment from contamination by un-decommissioned accident sites and facilities) where that responsibility should be -- on the facility's owner(s). This would also serve as an incentive for safety, provided that the rule places all costs above those covered by the bond on the owner(s) and provides that each owner shall carry insurance for these unbonded risks. Each owner would then have incentive to reduce insurance costs by acting to limit accident risks at their nuclear facility or facilities.

D.3.2.2.1

The NRC should also require a minimum decommissioning sinking reserve (for normal decommissioning) equal to at least \$1100/kWe (1981 \$) for nuclear power reactors, based on the decommissioning cost for Shippingport. This number appears to be conservative because Shippingport decommissioning cost that much even though its reactor is being disposed of as military waste, intact. The cost to dispose of a commercial reactor in civilian waste disposal is likely to be much higher.

D.1.1.1

The rules should also provide (cf. revised section 40.42 of 10 CFR) that any licensee which fails to fund or to carry out its decommissioning activities shall lose any other licenses which it holds, and that any license for which a licensee that has failed to fund or carry out decommissioning is an operator, co-owner, shareholder, or participant shall be suspended until such failure to fund or decommission is cured by funding or by proper carrying out of the decommissioning activities required to meet the definition of decommissioning proposed above (p.2, supra). This provision will provide strong incentives to carry out decommissioning activities and to fund them properly. However, it has a weakness if long-term storage of facilities is part of the decommissioning options. In that case, failure to maintain full funding for decommissioning of facilities in storage, failure to maintain safe storage (e.g. radiation or radioactive material leaks), or failure to carry out any required decommissioning activities should lead to loss of licenses and suspension of licenses that a licensee committing such failures is involved in, as above.

D.8.2

The rules approved should include comprehensive planning and safety criteria for decommissioning, in one place and referenced in others. The current rule is so vague and confusing that it is hard to tell when a license terminates, when the Commission determines that decommissioning has been properly carried out, or what rules apply to decommissioning. You may be sure that the clever lawyers employed by the nuclear industry will exploit any confusions or loopholes the Commission leaves intact, and the results will not benefit the public or the environment and may expose us to great radiation and financial risk. In sum, the present proposed rule is so defective that it cannot be safely stored in federal regulations; if entombed it might escape to do serious damage; the only solution is to promptly dismantle this proposal and start over again and do it right. If the Commission goes forward with such a sloppy rule, it will have long-term adverse consequences for public confidence in the nuclear industry, and for the environment. Given the present Commission majority's evident dedication to short-term financial and regulatory assistance to the nuclear industry come hell or high water (or worse), the above comments

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C.1.1

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may amount to Cassandra-like prophecies. However, the specific criticisms advanced above are intended to provide some guidance as to how to construct a decommissioning rule that would actually protect the public and the environment, and provide that responsibility for the nuclear industry's actions would rest squarely on the nuclear industry itself. Time does not allow us to provide a fuller critique, but one is certainly possible.

For example, the Commission itself ought to make the choice of decommissioning methods, rather than leaving it to licensees; the criteria for approving (or denying) decommissioning plans should be sufficiently specific that they can be interpreted consistently and unambiguously. The proposed rules give the Commission almost unbridled discretion to approve almost anything. Criteria for plans and procedures would help, but the Commission's current practice of finding exceptions to almost every rule a licensee cannot or will not comply with, does not lend confidence to even this approach (compare, for example, the licensing of Diablo Canyon, and the exemptions from safety requirements for TMI-1 in the restart proceeding). However, a good solid rule is much better than a group of regulatory guides that have no force or enforceability. The Commission appears to be trying to make a rule that is not really a rule, here. That approach can lead to many problems in the future. The Commission needs to instead adequately define decommissioning options and their environmental effects, prescribe procedures and criteria for the safe and effective carrying out of decommissioning, provide for readily available funding for both premature and "normal" (end-of-life) decommissioning (including provisions to clean up accidents), and put all of this into a clear rule that is enforceable. Otherwise, the decommissioning problem is just "shoved under the rug" for the foreseeable future. The NRC is evidently willing to leave a lot of problems for the future, rather than deal with them today. Such a policy, in fact or in rules like the decommissioning rules proposed at 50 FR 5600, cannot work well. You should abandon it and do the job right, or at the very least (and this may well be inadequate) incorporate revisions to cover the above-cited problems in these rules.

G.1

B.3.3

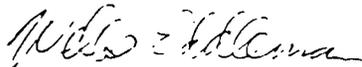
C.1.3

B.2.1

C.1.3

G.1

On behalf of myself and NC PIRG



Wells Fiddleman  
Staff Scientist - NC Public Interest  
Research Group



PROPOSED RULE *PK-30, 40, 50 et al*  
(50 FR 5600) *(19)*

UNIVERSITY OF VIRGINIA  
DEPARTMENT OF NUCLEAR ENGINEERING AND ENGINEERING PHYSICS  
NUCLEAR REACTOR FACILITY  
SCHOOL OF ENGINEERING AND APPLIED SCIENCE  
CHARLOTTESVILLE, VA 22901

May 6, 1985

DOCKETED  
Telephone: 804-924-7136

*85* MAY 10 10:27

Docketing and Service Branch  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Re: Comments on proposed amendments to 10 CFR Parts 30, 40, 50, 51, 70 and 72, Decommissioning Criteria for Nuclear Facilities, Federal Register Volume 50, No. 78, pages 5600-5625.

Dear Sir:

We write you to endorse the national organization of Test Research and Training Reactors' (TRTR) position on the proposed amendments. Acceptable levels of residual radioactivity for release of property for unrestricted use should be defined before the finalization of a decommissioning rule requiring cost estimates, since the values of such levels will greatly affect non-power reactor decommissioning costs. Proposed changes to Regulatory Guide 1.86 concerning decommissioning alternatives should be reviewed as to possible impact on decommissioning costs, also before final action on the proposed amendments. Finally, we believe it is important for a final decommissioning rule to distinguish between power and non-power reactors, to avoid future application of regulations to non-power reactors which were developed for power reactors.

E.2

G.3.1

Thank you for your attention.

Yours truly,  
*Robert U. Mulder*  
Robert U. Mulder, Director  
U.Va. Reactor Facility

cc: A. Francis DiMeglio, Chairman TRTR

MAY 15 1985 *pa*  
Acknowledged by card.....

DOCKET NUMBER  
PROPOSED RULE PR-30,40,50 et al (20)  
(50 FR 5600)

MERCY  
MEDICAL CENTER

4050 COON RAPIDS BOULEVARD • COON RAPIDS, MINNESOTA 55410 • TEL 427-2200

DEPARTMENT  
OF HEALTH  
CENTRAL  
SYSTEM

DOCKETING  
USNRC

May 7, 1985

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555  
Attention: Docketing and Service Branch

'85 MAY 10 10:29

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Sir:

In response to the proposed rule "Decommissioning Criteria for Nuclear Facilities" published in the Federal Register/Vol.50, No.28/Monday, February 11, 1985, we would like to suggest that it would be appropriate to exempt the 2500 medical licensees.

Removing Mercy Medical Center's nuclear medicine facilities safely from service and reducing residual radioactivity to a level that would permit release of the property for unrestricted use and termination of the license could be accomplished without requiring significant time, risk, or expense. Unit doses are obtained from a centralized radiopharmacy and all radioactive waste is returned to the centralized radiopharmacy daily via their messenger. Cessation of NRC licensed activities would merely require no further receipt of radioactive materials, return of waste and equipment quality control sources to the centralized radiopharmacy, and final monitoring. The area would immediately be available for other uses. A comparable situation no doubt exists for numerous other medical licensees. Implementation of the proposed action may impose requirements that are needlessly expensive and time-consuming.

G.G.1

It is respectfully requested that consideration be given to imposing the burden and expense associated with decommissioning only upon those licensees determined to have the potential for significant expense in order to accomplish disposal and decontamination. Inclusion of medical licensees would, at least in Mercy's case, be unwarranted and counterproductive to government and private sector efforts of health care cost-containment.

Sincerely,



Paul Halverson,  
Certifying Official for License No.22-17307-01



William Kinney, M.D.  
Radiation Safety Officer for License No.22-17307-01

BBH/bbh

Acknowledged by card..... MAY 15 1985 *PK*



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

RHODE ISLAND ATOMIC ENERGY COMMISSION  
Nuclear Science Center  
South Ferry Road  
Narragansett, R.I. 02882-1197

May 7, 1985

DOCKET NUMBER PR-3040 50 et al  
PROPOSED RULE (50 FR 5600) (21)

85 MAY 10 A10:36

DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Docketing and Service Branch

Dear Sir:

The national organization of Test, Research and Training Reactors (TRTR) is pleased to submit its comments on the proposed amendments to 10CFR Parts 30, 40, 50, 51, 70 and 72, Decommissioning Criteria for Nuclear Facilities, Federal Register Volume 50, No. 28, pages 5600-5625. For the most part, TRTR facilities will be subjected to the amendments proposed for Part 50 and Part 30 (either directly or through the agreement state compatibility requirement.) A few facilities will be subjected to the amendments proposed for the remaining parts. TRTR's comments are directed primarily to the Part 50 and 30 proposals with differing applicability to the remaining parts.

The non-power licensed reactor community is diverse with operating organizations representing state and federal governments, state colleges and universities, private colleges and universities, non-profit organizations and for profit organizations. In some instances, the non-governmental organizations have operating budgets, assets and capitalization in excess of or approaching the resources of state or local government organizations. Since state and local government licensees may provide the financial assurance for decommissioning through a certification process, well capitalized, firmly established private organizations should also be permitted to comply through certification.

TRTR recognizes that acceptable levels of residual radioactivity for release of property for unrestricted use are not part of this rule making. However, from actual decommissioning of non-power reactor facilities, TRTR has learned that the values of these acceptable levels will greatly impact the costs of decommissioning a non-power reactor and, therefore, should be addressed before the finalization of a decommissioning rule which requires cost estimates.

G.3.1

D.3.2.4

E.2

It would also be useful to review the proposed changes in Regulatory Guide 1.86 concerning decommissioning alternatives before finalization of the decommissioning rule since these changes may also impact non-power reactor decommissioning costs.

G.17

Many non-power reactor facilities are licensed pursuant to Parts 30 and 50; a few are licensed pursuant to Parts 30, 40, 50, and 70. The cost of total decommissioning will be less than the costs of decommissioning piecemeal and the rule should allow licensees to adjust cost estimates accordingly.

D.1.2

The primary concern of TRTR is that these proposed amendments were obviously drafted to insure that the money necessary to decommission a nuclear power plant or a nuclear fuel or reprocessing plant will be available when required. Since there is little actual experience in decommissioning a large nuclear facility, it is reasonable to address decommissioning requirements during the early life of these plants.

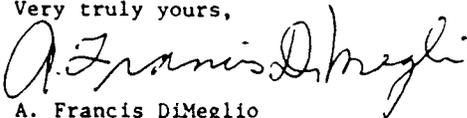
The situation for non-power reactors, however, is considerably different in at least two respects. First, the monies required are considerably less than that required for power reactors: in most cases the decommissioning may be possible with funds equivalent to one or two years operating budgets. Secondly, there is considerable experience in the decommissioning of non-power reactors which demonstrates that the decommissioning process is straightforward with no real uncertainties. In fact, for most non-power reactors removal of the radioactive fuel, while not allowing unrestricted use, will result in a facility with little potential for health and safety problems. TRTR therefore stresses that the planning for decommissioning of non-power reactors be handled separately from the planning for power reactors and fuel facilities.

G.3.1

During the development of this decommissioning rule, the NRC appropriately received input from organizations associated with power plants. TRTR is unaware of comparable input from the research reactor community and believes that these proposed amendments are another example of applying to non-power reactors regulations which were drafted primarily for power reactors. TRTR recommends that as in the past, non-power reactors be provided for specifically in the applicable regulations.

Thank you for your consideration.

Very truly yours,



A. Francis DiMeglio  
Chairman, TRTR

AFD:ag



UTILITY REGULATORY  
PROPOSED RULE PR-30,40,50 et al  
(52 FR 5600) (22)

San Diego Gas & Electric

May 6, 1985

FILE NO  
DOCKETED  
USNRC

'85 MAY 10 10:42

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attn: Docketing and Service Branch

Re: Proposed Rule - Decommissioning Criteria for Nuclear  
Facilities (Federal Register Notice, Feb. 11, 1985,  
page 5600ff)

Dear Sir:

San Diego Gas & Electric Company is pleased to comment on the proposed rule, entitled "Decommissioning Criteria for Nuclear Facilities," as requested by the NRC in the Federal Register citation specified above. As co-owner and co-licensee of the 3-unit San Onofre Nuclear Generating Station, SDG&E is an interested party in such rulemaking to assure safeguarding the interests of our customers and shareholders. We are also party to the proceedings (OII-86), mandated by the California Public Utilities Commission, on mechanisms for assuring adequate financial resources for the decommissioning of nuclear power plants.

Our comments are organized to parallel the subheadings of the proposed rule, per the Federal Register notice, and are focussed solely on its applicability to power reactor facilities (type 1 license).

A. Decommissioning Alternatives

The proposed rule defines "decommissioning" as the process "to remove nuclear facilities safely from service and reduce residual radio-activity to a level that permits release of the property for unrestricted use and termination of license" by the NRC. (P.5600,FR) Also, all the alternatives cited focus on "release for unrestricted use." Such emphasis appears to be too narrow and restrictive. It should be recognized by the NRC, and permitted by the rule, that plant sites are improved private property. As such, they represent large investments dedicated to electric power generation and have been prepared for indefinite commitment to that purpose by provision of transmission lines, cooling (heat sink) facilities, road and rail transportation access, etc. Even if nuclear operations at such sites were to be eventually terminated, the valuable energy-related attributes would

B.1.3

most likely suggest continued utilization in energy-producing pursuits, entirely consistent with the public interest. Thus, "unrestricted use" is too restrictive a criterion to be applied.

For example, such a site (perhaps occupied by several nuclear units or by a mix of fossil and nuclear units) could continue to be utilized via the construction of additional facilities (repowering, add-ons, etc.) whose service lifetimes would prolong beneficial use of the site. The NRC, in formulating this rule, should exercise caution to avoid inhibiting site uses that cannot be construed as "unrestricted."

B.1.3

B. Timing

The proposed rule seems to favor prompt decommissioning after license termination. In fact, it would require that the licensee submit "an up-to-date" cost estimate 5 years prior to the projected end of operation, presumed to be the final date of the current operating license. For such a cost estimate to be realistic and reasonably complete, planning for the final disposition of the unit (site?) must have been initiated earlier (8 years prior to end of life?). Thus, this requirement may force premature commitment to an uneconomic plan of action or to a less-than-optimum course from the overall public interest point of view.

B.4.1

The NRC, here, seems to gloss over the ever-present and legitimate oversight of licensees by their public utility commissions. The latter have exhibited tendencies of late to involve themselves in, and to influence directly, the decisions of utilities which clearly extend to such matters as re-licensing, repowering, site utilization, etc. By imposing premature disclosure of plans (and estimates) for which no consensus exists, the NRC places the utility in a position of higher risk solely as a consequence of the prescriptive nature of the rule.

The NRC should review whether the benefits to them of such provisions in the rule outweigh the potential for federal-state conflicting requirements imposing needless costs and uncertainties on all of its utility licensees.

C. Planning

It appears that there is an inconsistency of the requirements of the proposed rule in the Federal Register notice and the wording of the rationale for such requirements acknowledged in Staff's Regulatory Analysis. E.g., from the notice: "Thus, most of the planning for the actual decommissioning will occur near final shutdown"; and, from the Regulatory Analysis: "Final planning (for type 1 licensees) is already required, but only when

C.2.2

the licensee desires to dismantle. For a power reactor such planning would be elaborate because of the complexity of the facility being decommissioned" - and, I would add, - and the intended future use of the site (facility). (Emphasis added.)

Clearly, these statements do not support the rule's requirement for the cost estimate to be submitted 5 years prior to the end of operation; as noted in Section B, Timing, the requirement could be counter-productive and seems to be premature. The "final planning," envisioned by the NRC, anticipates a year or so for "review and approval." If so, what is the justification for the earlier submittal (5 years prior to end of operation)? As noted in the foregoing, the submittal of a cost estimate requires the preparation of a detailed plan lest the basis of the estimate be deemed tenuous and unsubstantiated either by the NRC or the state PUC. Since a final, revised cost estimate is also being mandated, is the earlier estimate necessary or even desirable?

C.2.2

I would urge the NRC to coordinate the requirements of its proposed rule with several state PUCs, NARUC, etc. Not only in the areas of Planning and Timing, but also in Financial Assurance, coordinated and consistent State and Federal requirements are critical for successful, cost effective decommissioning.

D.8.3.1

D. Financial Assurance

As in all things nuclear in our polarized society, the focus on adequacy of funds for decommissioning has been inflated far beyond any realistic concern. The proposed rule seems to adopt a punitive philosophy.

Coal plants not required to adhere to such rules despite the fact that the health hazards and environmental impacts of the plants and their waste disposal (ash, sludge, etc.) facilities are more severe (in realistic terms) to the public health and welfare. Similarly, petrochemical plants and oil refineries are immune from public health concerns with no requirement for comprehensive decommissioning provisions to sequester carcinogenic by-products, etc.

G.1

D.8.1

Yet, we find the licensees of nuclear power facilities singled out for special treatment and the NRC only too eager to comply with faulty public perceptions to the risks involved. And, in so doing, the NRC lends credence to those faulty and false perceptions!

Why should \$100 million be prescribed? Shouldn't the estimate rely upon realistic site-specific surveys? Why are not the salvage credits applicable to nuclear facilities considered (deductible from decommissioning estimates)? Such salvage credits should include the value of re-use of uncontaminated valves, pumps,

D.2.1(a)

D.1.1.3

instruments, heat exchangers, warehouse facilities, documentation storage and retrieval facilities, as well as a fuel credit for approximately one-half of the useful fuel in the core at final shutdown. For a modest shipping and/or handling charge, such fuel could be sold to another utility (or used in a sibling facility owned by the utility faced with decommissioning a unit) and its energy value could be of the order of \$50 million (same basis as that specified for the \$100 million decommissioning cost).

D.1.1.3

Further, why should the funded amount be escalated at twice the CPI? Construction cost indices may be appropriate (probably on the high side), but not twice the annual change in the consumer index! (The Staff Regulatory Analysis shows no sign of an evaluation or justification for this prescription.)

D.2.1(a)

The funding methods, deemed acceptable to the NRC, impose a wide range of financial penalties on the utility and its customers. The presumption implied in this rule, that utilities with nuclear facilities will shirk their decommissioning responsibilities and so must provide funding assurances, is ludicrous and worse, perpetuates the popular public pastime - utility bashing! Does the NRC see its best interests served by participating in such sport?

D.8.1

As a minimum, the funding aspects of decommissioning should be removed as a license condition (§ 50.54) from the proposed regulations.

D.4.4

It is instructive to note the numerous references in the Staff Regulatory Analysis to the NRC concern for "sociopolitical problems" in connection with decommissioning. Where in the Atomic Energy Act of 1954 and its amendments is the NRC charged with responsibilities for sociopolitical problems?

G.26

#### E. Residual Radioactivity Levels

The proposed rule does not address this subject, promising to consider it in a separate rulemaking. The NRC should be careful, in separating these closely related topics, not to create inadvertent impediments to defining appropriate residual radioactivity levels in this rule. The repeated emphasis on decommissioning to permit unrestricted use raises the specter of great difficulty, in subsequent applications of the rule, in accepting reasonable levels for various industrial use patterns that should not be viewed as "unrestricted use." Similarly, partial decommissioning of a portion of a facility, consisting of mixed nuclear and non-nuclear activities, should not be emburdened by meaningless considerations of unrestricted use.

E.1.1

B.1.3

It is apparent that the NRC is preoccupied with assuring public safety following total release of a nuclear site. As noted

earlier, for nuclear power reactors and their sites, the probability of complete abandonment of industrial, indeed continued energy generation utilization, is extremely remote. Therefore, proper context would require the NRC to promulgate the rule for residual radioactivity levels, appropriate to various uses, before the current proposed rule. In that way, needless expense or litigation over adequacy of plans, etc. could be avoided.

B.1.3

E.1.1  
E.2

F. Environmental Review Requirements

The proposed rule quite properly limits such requirements and is consistent with the view that the environmental reviews conducted during the Construction Permit and Operating License proceedings for nuclear power reactors assure adequate review of decommissioning impacts. The NRC is commended for its forthright position in this area and is urged to stand steadfast to this position.

F.1

General Comments

The Staff Regulatory Analysis in support of the proposed rule is flawed in a number of aspects. Its philosophical basis adopts unfounded assertions as premises justifying elements of the rule; e.g. --

1. It is claimed that current regulations are "limited, vague or inappropriate and are not fully adequate." It decries "licensing activities - made on a case-by-case basis." It asserts that "this procedure results in a lack of uniformity, inefficiency, timeliness, and comprehensiveness."

None of these accusations are supported by evidence for type 1 licensees (power reactors in particular). Thus, NRC difficulties (?) with non-fuel-cycle licensees are being used to justify the imposition of unreasonable requirements on utilities.

G.1

2. It is claimed that "A power reactor has potential for substantial health, safety, and environmental impact if decommissioning is improperly performed." As a theoretical assessment such a claim is true, but then everything in our society has the potential for adverse impact if "improperly performed." Nowhere is the burden of proof satisfied to show that current practices have resulted in such impacts - from power reactors! The attitude displayed is that, absent these stringent and prescriptive regulations, utilities will behave as "midnight dumpers of toxic chemical wastes."

The Staff assumes that utilities are unstable and likely to

D.8.1

be unable to meet the commitments of their current licensing commitments. This mindset and subsequent provisions of the rule must be expunged from this proceeding if equitable and reasonable positions are to result.

D.8.1

3. The unfounded concern for "sociopolitical problems" has been noted earlier.
4. The Staff acknowledges and requires that the "decommissioning plan -- take into account the financial and technical situation at the time of actual decommissioning." No guidelines are provided, nor criteria stated, for assessing the technical situation. And, rightly so, since no better device than a "crystal ball" currently exists to project that situation; factors such as low level waste disposal cost and availability, site re-use plans, state-of-the-art in robotics, residual radioactivity limits, etc. are critical to rigorous planning.

G.26

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Yet, none of these unknowns deter the Staff from requiring elucidation of the distant future in detail!

5. The Staff insists that "Explicit procedures and requirements for a licensee to terminate a license must be clearly delineated"; and, "Surveys submitted for termination must be designed to demonstrate with a high degree of confidence that the property is suitable for release for unrestricted use." As discussed earlier, such definitive detail is premature, may preclude alternative beneficial utility uses and plans, is unnecessary, and is likely to be burdensome and misleading, since the submittal of a plan may create a false sense of security that adequate, permanent compliance has been accomplished and accepted by the NRC.
6. The Staff presumes that requirements of this rule on the public impacts will "minimize licensee decommissioning impacts on health, safety and the environment," will "ensure decommissioning is done as promptly as reasonable"; "a non-operational facility does not become a public burden," and "will minimize ratepayers costs relating to decommissioning." For utility-owned facilities, there is no proof offered that such public impacts are to be expected in the absence of this rule, or have occurred in earlier cases, or that the burdens imposed by the rule are not a more severe negative public impact.
7. The Staff evaluation of the costs of the requirements of the proposed rule is naive and optimistic. E.g. the amounts already expended by the California nuclear utilities in the PUC OII-86 proceedings exceeds the

C.2.2

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D.8.1

G.19

Staff estimate for 110 operating reactors; and, this proceeding deals only with methods of providing financial assurance.

G.19

Lest it be judged from the foregoing that these comments are entirely negative, the Staff's recognition that planning "for decommissioning at an early stage of facility construction and operation is desirable" is appropriate. Actually, such planning should be accomplished early in the design stage in conjunction with design reviews for operability and maintainability. It should also be noted that the record-keeping provisions of the rule are entirely consistent with good maintenance practices to enhance reliability and dose minimization (ALARA).

C.2.1

C.7.1

We have expended considerable thought and effort in the preparation of these comments. Our intent has been to provide logical, practical and constructive suggestions to the NRC to guide its deliberations in decommissioning of power reactors. We hope that the NRC will consider the content of the comments from those points of view.

Sincerely,



L. Bernath, Manager  
Nuclear Department

PROPOSED RULE 50 FR 5600 et al (23)

**YANKEE ATOMIC ELECTRIC COMPANY (50 FR 5600)** Telephone 617 872-8100

FYC 85-06  
GLA 85-50  
1671 Worcester Road, Framingham, Massachusetts 01701

May 9, 1985

COMM-FEET  
USNRC

A. R. SOUCY  
TREASURER AND  
CHIEF FINANCIAL OFFICER

'85 MAY 10 AM 11:12

Secretary of the Commission  
United States Nuclear Regulatory Commission  
Washington, D. C. 20555

OFFICE OF THE  
SECRETARY  
BRANCH

Attention: Docketing and Service Branch

Subject: Comments Pertaining to Decommissioning Criteria for Nuclear  
Facilities; Proposed Rule (50 FR 5600, 11 February 1985)

Dear Sir:

Yankee Atomic Electric Company appreciates the opportunity to comment on the subject document. Yankee Atomic owns and operates a nuclear power plant in Rowe, Massachusetts. The Nuclear Services Division also provides engineering and licensing services for other nuclear power plants New England.

Yankee Atomic has maintained its awareness of this rulemaking since 1978, when the Commission published the Advanced Notice of Proposed Rulemaking together with several NUREG reports on decommissioning technology and costs. Most recently, we participated in the Commission briefing made on September 20, 1984 on the financial and technical aspects of decommissioning.

Yankee Atomic is also a member of the Utility Decommissioning Group (UDG), which is comprised of the Edison Electric Institute and thirteen nuclear utilities, and we have participated in the development of the comments that will be filed by the UDG at our request and in our behalf. We urge the Commission to give the fullest consideration to the UDG's comments, since they represent a unique and insightful contribution to the record in this rulemaking. In addition, we would like to briefly summarize our position as follows.

First, we believe that if the Commission should decide to proceed with this rule, it should reconsider its proposed use of the \$100 million certification alternative for providing financial assurance of decommissioning funds. While the Commission's rationale for certification appears to be the commendable objective of minimizing the administrative burdens for itself and licensees, we believe that the certification alternative is similar to the imposition of a revenue requirement—a matter which is for regulatory agencies, rather than the Commission, to determine. In most cases, it is clear the \$100 million would be inadequate to cover decommissioning for a large scale power reactor. The Commission has evidently adopted the \$100 million figure from the Batelle study, which was designed to estimate decommissioning costs in order of magnitude terms only. Also, the proposed rule does not make clear what costs the \$100 million certification amount is intended to cover.

D2.1(a)

D2.1(b)

Secretary of the Commission  
May 8, 1985  
Page 2

The Commission should seek to avoid the selection of such an inappropriate certification amount, especially where the codification of a specific amount in the Commission's regulations could well become a presumption or a cost ceiling in utility rate proceedings. If the Commission should decide, instead, to proceed with its rule as proposed, we believe there will be a substantial risk to utilities that rate regulators would tend to reject arguments by utilities that the Commission's \$100 million figure was somehow inappropriately chosen. Thus, we suggest that the certification alternative be deleted, or that the certification amount be appropriately revised and its purpose clarified.

D2.1(a)

D2.1(b)

Second, we are concerned about the possibility that the proposed decommissioning requirements would be imposed as conditions of operating licenses. There would be a substantial risk, for example, despite the Commission's contrary intentions, that a licensee's desire to change an approved funding plan would be construed as requiring a license amendment. Most changes, in fact, could be expected to increase the licensee's level of funding, to reflect changes in inflation and interest rates. Such changes would not adversely affect any party's interests. Further, the proposed requirements could be said to have no direct impact on safe operation of the plant. We believe that the formal hearing procedures associated with license amendments would be inappropriate in most all cases regarding desired changes to a funding plan.

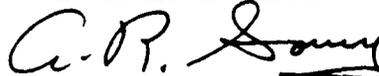
D.4.4

Further, we believe that the Commission should seek to avoid the kind of procedural problems that have arisen when it attempts to modify a requirement that was established as a license condition.<sup>(1)</sup> The Commission's enforcement authority is the same, regardless of whether a violation of a regulation or a license condition is involved. Thus, we suggest that the Commission avoid the imposition of decommissioning funding and record keeping requirements as license conditions, and clarify in any final rule that changes to a funding plan or record keeping program do not constitute license amendments.

C.7.2

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY



A. R. Soucy  
Treasurer and Chief Financial Officer

ARS/djw

(1) See, e.g., Union of Concerned Scientists V. Nuclear Regulatory Commission, 711 F.2d 370 (D.C. Cir. 1983).



DEPARTMENT OF THE ARMY  
 HEADQUARTERS, U. S. ARMY MATERIEL COMMAND  
 5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333-0001

PROPOSED RULE PR-30,40,50 et al  
 (50 FR 5600) (2A)

May 6 1985

DOCKETED  
 USNRC

'85 MAY 10 AM 1:19

OFFICE OF  
 DOCKETING & SERVICE  
 BRANCH

Secretary of the Commission  
 U.S. Nuclear Regulatory Commission  
 Attention: Docketing and Service Branch  
 Washington, D.C. 20555

Gentlemen:

Confirming my May 6 1985 telephone call to Mr. Keith Steyer, Office of Nuclear Regulatory Research, request the Department of the Army be given a 90 day extension to comment on the NRC Proposed Rule on Decommissioning Criteria for Nuclear Facilities, Title 10 CFR Parts 30, 40, 50, 51, 70, and 72 (FR VOL 50 No 28, dated Feb 11, 1985). Alternatively, recommend NRC revise and restaff the proposed rule to provide the additional information needed for review and implementation to include federal agency funding criteria and other issues which follow.

The extension is requested to permit the Army to more thoroughly review the proposed rule; to assess potential impact and recommend additional changes which would fulfill the intent of the Proposed Rule with the least adverse impact on Army readiness and programs.

NRC has issued approximately 177 licenses to Army organizations without including licenses issued to contractors operating Army government owned, contractor operated facilities or to contractors providing services or equipment to the U.S. Army. Some of these licenses are limited in scope of materials and locations; other licenses cover a variety of materials at many locations and use throughout the Army and other services. Each such Army broad license is the equivalent to having several hundred Army activities getting their own licenses. While the percentage of licenses held by the Army may be small, the coverage is significant.

To date our review indicates:

- a. Decommissioning cost estimates appear very low based on experiences at Weldon Spring (\$160,000,000 to cleanup contamination caused by an AEC contractor), at Seneca Army Depot (\$300,000 for Army cleanup of igloos in which AEC had stored ore; \$1,300,000 if done by contract) and at Frankford Arsenal (\$2,000,000 for cleanup of contamination related to source and byproduct licensed operations in non-readily dispersible form).

See Comment  
 Letter No. 135

Acknowledged by card... MAY 15 1985  
*pd*

b. Proposed rule should have included NRC unrestricted use levels which are needed to realistically assess the proposed decommissioning costs.

c. NRC appears to have overlooked certain significant implications related to Federal licensees. The costs associated with Federal licensees is not included on Page 5612. The proposed Federal entity certification in 10CFR 30.35(e)(4) (and elsewhere in related other Parts) needs legal review in light of 31 USC 1517 which precludes Federal employees from obligating money in advance of appropriation. If a Federal agency could legally provide such certification, reorganization or abolishment of the agency could occur without decommissioning being accomplished. Therefore there is a need for a Federal funding strategy and logically NRC should be the lead to develop such a strategy. Without such a strategy, compliance might not be possible.

d. The proposed rule doesn't appear clear as to the financial obligations of broad scope licensees related to their various authorized facilities/sites. Maintenance of records might not be a sufficient substitute for requiring readjustment of financial assurance in the event of an incident.

In the future recommend that proposed changes of this impact be more widely publicized. The majority of Federal agencies contacted by this office were unaware of the proposal.

See Comment  
Letter No. 135

Sincerely,

  
Darwin N. Taras  
Chief, Health Physics  
Safety Office

Copies Furnished:

Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission,  
WASH, DC 20555

ODASD(EO/SP), Rm 1B873, Pentagon, WASH DC 20310

Deputy, ESOH, OASA (I&L), Rm 2E577, Pentagon, WASH DC 20310

HQDA (DAEN-ZCE), WASH DC 20310

HQDA (DAPE-HRS), WASH DC 20310

NAVSEA

DEPT OF AGRICULTURE

PROPOSED RULE PR-30, 40, 50 et al  
(50 FR 5600) (25)

# GENERAL ELECTRIC

NUCLEAR ENERGY BUSINESS OPERATIONS  
GENERAL ELECTRIC COMPANY • 175 CURTNER AVENUE • SAN JOSE, CALIFORNIA 95125

CONF

April 29, 1985

'85 MAY 10 AM 1:51

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

OFFICE OF THE SECRETARY  
DOCKETING & SERVICES  
BRANCH

Attention: Docketing and Services Branch

SUBJECT: GE COMMENTS ON PROPOSED AMENDMENTS ON  
DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES  
(50 F. R. 5600; February 11, 1985)

General Electric (GE) appreciates this opportunity to comment on the proposed rule. The requirements for decommissioning are an important nuclear licensing issue, especially those concerning the assurance of decommissioning funds. The Atomic Industrial Forum and its member organizations, including GE, submitted recommendations to the Commission regarding a re-evaluation of the decommissioning regulations on July 17, 1978. At that time we explained our view that the current decommissioning regulations were adequate. Nevertheless, in response to the Commission's proposed decommissioning rule, GE offers the following specific comments.

We support the proposed rule's method of permitting research and test reactor licenses and materials licenses (in contrast to power reactors) to be considered on a case-by-case basis, where applicable. Regarding the financial assurance requirements of the proposed rule, we believe qualification for the various funding methods should be based on the financial condition and decommissioning risk of the specific applicant or licensee. This could be done by use of an objective financial test or tests, thus avoiding arbitrary groupings of utilities, governments, and all others as criteria for funding methods. In addition, we believe that a financial test plus a guarantee should be added as an acceptable funding method. Use of standard financial tests on a case-by-case basis would improve the degree of financial assurance and eliminate unnecessary cost burdens for many non-utility, non-government entities. Additional, detailed comments concerning financial assurance appear as an attachment to this letter.

G.1, G.3  
D.6.4.1.1

GE believes that there are a number of issues which should be resolved prior to the issuance of this rule in order to permit the rule to be implemented most effectively. The definition of decommissioning in the proposed rule requires that residual radioactivity be reduced to a level that permits release of the property/facility for unrestricted use. However, no limit for the level of required decontamination has been established and, in addition, there are significant difficulties in arranging for the disposal of some constituents of the radioactive wastes.

E.2  
G.4

Approved: \_\_\_\_\_  
Special Agent in Charge  
PR

GENERAL  ELECTRIC

Page 2  
Secretary of the Commission  
4/29/85

The level of decontamination required for release to unrestricted use should be specified prior to issuance of the rule to allow an assessment of the cost of decommissioning. Without these limits, we must assume that the Regulatory Guide 1.86 values are acceptable.

E.2

The current requirements for land disposal of radioactive wastes (10CFR61) appear to prevent highly activated hardware containing nickel-63 from being accepted for burial. The NRC should ensure that materials such as control blade tips which have been removed and sectioned for disposal can be buried. In addition, burial of transuranic wastes and large quantities of cesium-137 is not presently permitted. A regulation which requires the decommissioning of a facility should not, at the same time, produce components which could not be disposed of and which would therefore require continued surveillance.

G.4

In addition, while the NRC has no direct responsibility in this area, the uncertainty regarding availability of low-level radwaste disposal sites must be resolved. The deadline for interstate compact control of radwaste disposal sites is January, 1986; but no compact has yet been ratified. Without such a resolution, only facilities located in a state which is a member of a compact having a current disposal site would be able to dispose of its waste. Facilities in other States would be forced to utilize either SAFSTOR or ENTOMB since, under the current scheme, they would either be excluded from use of the burial site or would be penalized through the assessment of a use charge.

H.1.1

If there are any questions on the information provided herein, please contact me or R. L. Gridley (408) 925-3732.

Very truly yours,



Glenn G. Sherwood, Manager  
Nuclear Safety & Licensing Operation

Attachment (s)

ATTACHMENT

COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

The stated objective of the proposed rule on financing decommissioning is "to require the licensee to provide reasonable assurance that adequate funds are available to ensure that decommissioning can be accomplished in a safe manner and that lack of funds does not result in delays that may cause potential health and safety problems." We concur in this objective and we comment the NRC for permitting flexibility in planning for decommissioning in light of the variety of facility types and licensee financial situations.

D.8.1

D.3.1

However, we believe the rule as proposed is overly restrictive. Furthermore, in some cases, the rule would result in cost burdens which do not enhance the degree of assurance of the availability of funds and, thus, are not necessary in meeting NRC's stated objective.

D.6.4.1.1

The proposed rule makes no distinction between nuclear facilities with a generally fixed operating life such as power reactors and facilities with an open ended operating life (e.g., materials laboratories, spent fuel storage facilities, fuel production facilities, etc., that are part of ongoing businesses). The proposed regulation appears to require that a funding method be implemented immediately upon approval of a licensee's preliminary decommissioning funding plan. This blanket approach to all nuclear facilities, regardless of planned operating life, seems inappropriate and inconsistent with normal business and financial practices (i.e., money is not normally set aside for business termination until the termination is actually foreseen). A more normal and appropriate approach would be to proceed with planning for decommissioning as proposed in the rule, but to defer implementation of a funding method until termination of operations is planned.

G.3

The proposed rule states several principal funding methods and also "other funding methods which are demonstrated by the applicant or licensee to provide comparable assurance to the (principal) methods listed..." No definition of these other methods is provided, which makes it difficult to comment in detail. We consider the other methods

D.6.4.2

ATTACHMENT

COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

and the specific criteria for evaluating "comparable assurance" to be significant issues and are interested in any further information and examples that might be available. We would like to provide additional comments on those issues to the NRC. Nevertheless, we hope that at least some of the enclosed recommendations will be helpful in defining "comparable assurance."

D.6.4.2

In many cases, the proposed rule would not provide a reasonable and appropriate balance between costs to the applicant/licensee and the benefits in terms of degree of financial assurance. A prime reason for this is the categorization of applicants and licensees into four groups, each with a different set of standards for financial assurance:

- o Electric utilities with more than one generating facility.
- o Electric utilities with one generating facility.
- o Federal, state and local governments.
- o All other

D.6.4.1.1

We surmise that the intent of the first three categories is to identify those types of entities with consistently strong financial conditions and very low probabilities of default (i.e., utilities and government entities). Since these applicants/licensees represent relatively low risk, they are permitted less restrictive and less costly funding methods (e.g., internal reserves, government guarantees). In these cases, the balance between the cost of the funding methods versus the size of the risk seems reasonable.

However, we believe that the "All Other" category includes many applicants/licensees with similar financial strengths (dependable revenue sources, long histories of financial stability, etc.). The All Other category includes some of America's largest and financially strongest companies. Many of these large companies have independent credit ratings that compare favorably with those of utilities and state and local governments. Moreover, the decommissioning costs probably

ATTACHMENT

COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

represent a much smaller proportion of overall financial resources for these large companies than is the case for most utilities.

In the interest of fairness, we feel strongly that any applicant/licensee that can demonstrate continuing financial stability and solvency should not be required to assume an unnecessary, and perhaps unreasonable, cost burden with respect to the assurance of available funds. As explained in more detail below, we urge that the rule recognize the use of available standard financial measurements in evaluating an applicant/licensee's financial condition and its ability to meet decommissioning costs. Since these measurements would be applied consistently to all applicants/licensees, it appears that the evaluations would be more objective and equitable than designating certain funding methods for certain types of licensees. Not only do we believe such measurements would be valuable in alleviating undue cost burdens to the applicant/licensees by more clearly identifying financial risk and the need for a particular funding method, but more importantly, we believe a better level of financial assurance would result.

D.6.4.1.1

We have two strong recommendations in this regard:

1. A standard financial test or tests should be established to evaluate eligibility for the various proposed funding methods (rather than using industry/government groupings), and
2. A financial test should be added as an acceptable funding method, that is, if an applicant/licensee met the financial test, that test plus an applicant/licensee guarantee would represent financial assurance and no other additional funding provision would be required.

Various financial tests have been used for many years by creditors, investors and independent rating services which have proved accurate in measuring financial conditions. Financial tests are used in the Environmental Protection Agency's "Standards Applicable to Owners and

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COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

Operators of Hazardous Waste Treatment, Storage and Disposal Facilities" (40 CFR Parts 264 and 265). The EPA uses two alternative sets of criteria to recognize that different industries have different normal financial standards. The two alternatives are shown as follows:

Alternative I:

(A) Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and

(B) Net working capital and tangible net worth each at least six times the sum of the current closure and post-closure cost estimates; and

(C) Tangible net worth of at least \$10 million; and

(D) Assets in the United States amounting to at least 90 percent of total assets or at least six times the sum of the current closure and post-closure cost estimates.

Alternative II:

(A) A current rating for most recent bond issuance of AAA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A, or Baa as issued by Moody's; and

(B) Tangible net worth at least six times the sum of the current closure and post-closure cost estimates; and

(C) Tangible net worth of at least \$10 million; and

D.6.4.1.1

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COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

(D) Assets in the United States amounting to at least 90 percent of total assets or at least six times the sum of the current closure and post-closure cost estimates.

Besides these two alternatives, the EPA regulations also permit petitions to include additional test criteria by a particular industry.

We also recommend that at least one additional alternative financial test be included: If decommissioning costs constitute a small fraction (e.g., 5%) of a licensee's net worth and the licensee provided a guarantee, this would be sufficient financial assurance. This is merely an extension of the EPA financial tests. The EPA tests include a net worth requirement of at least six times the cost estimate for facility closure. However, a licensee whose net worth is 20 or 50 times decommissioning cost probably represents much less risk than a licensee whose net worth is six times decommissioning cost. Looking at it another way, a decommissioning cost of \$10 million may appear significant in isolation, but may be an insignificant risk if it represented only 5% of an applicant/licensee's total assets, net worth, revenues, etc. We believe a licensee facing a \$10 million decommissioning cost with a \$20 million net worth represents much greater risk than a licensee facing a \$50 million decommissioning cost with a \$1 billion net worth.

D. 6.4.1.1

Additional alternative financial tests may be appropriate to accommodate different types of licensees. We believe the Commission should seek such information from applicants/licensees.

A financial test should also contain a provision which addresses deterioration of a licensee's financial condition. It is unlikely that a financially sound licensee (i.e., one which meets financial test criteria) would go bankrupt in a short time period. However, to protect against deterioration, the licensee's ability to meet the test should be reviewed annually. If a licensee is no longer able to meet the test,

ATTACHMENT

COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

that licensee should be required to provide another funding method within a short time period. The financial tests should have sufficient safety margin so that there would be reasonable financial assurance during that period. As a matter of reference, the EPA financial tests include such a provision.

We recognize that the addition of a financial test and guarantee as an acceptable funding method would present some administrative burden to the Commission. However, we believe that the benefits of this method would far outweigh any disadvantages. The EPA has administered a financial test method for several years and we are unaware of any significant problems. In addition, it seems that the administrative burden would be less for the NRC than the EPA because (a) there are fewer nuclear facilities/licensees than hazardous waste facilities, and (b) there has been long-standing and tight control maintained by the Federal Government for the nuclear industry (as opposed to the much more recent regulation of hazardous waste). Whatever additional costs would be incurred by the Commission would be far more than offset by the applicant/licensee savings realized by not having to spend money needlessly and unproductively for other funding methods.

D.6.4.1.1

In regard to the guarantee that would go along with a financial test, we understand that the Commission may be concerned about the obligations of a parent company versus an operating subsidiary. In NUREG-0584 ("Assuring the Availability of Funds for Decommissioning Nuclear Facilities"), the Commission mentioned that in the event of an operating subsidiary default, assets of the parent company might be shielded from creditors. Thus the issue could be avoided by requiring that a guarantee be provided by the parent company. It may also be pertinent to note that the EPA accepts guarantees from both operating subsidiaries and parent companies.

Specific comments on the various funding methods included in the proposed rule are discussed in the following paragraphs.

ATTACHMENT

COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

- 1) Prepayment: While this method provides a high degree of financial assurance, it also represents a very significant cost burden to licensees. An applicant would be required to set aside funds in advance of deriving any benefit from the facility. Although interest could be earned on the prepaid fund, the interest earned would very likely be less than the (a) potential return on investing in a company's own business, or (b) cost of money if the prepayment has to be borrowed. In the case of borrowing, the additional debt would also have an unfavorable effect on the applicant/licensee's general financial condition.

A utility might select the prepayment method because its costs might be passed on to its customers. However, that seems unproductive and would benefit no one (except the bank holding the fund).

We expect that this alternative will not be chosen frequently.

- 2) External Sinking Fund: This method is less burdensome in that more time is allowed to accumulate funds. However, the requirement for insurance or a surety method in addition to the sinking fund may be unnecessary in many cases and a financial test and evaluation of risk should be used to determine the need for insurance. In the case of a financially strong licensee, additional insurance would have no material effect on the financial risk but would represent additional cost. Even the possibility of a premature closure may not significantly increase the risk of default in many cases. For many licensees, nuclear facilities (a) contribute a small portion of overall revenues, and (b) represent decommissioning costs that are only a small fraction of overall assets, net worth, etc.

D.6.4.1.1

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COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

One significant aspect related to the sinking fund method that needs clarification is the amount of time that would be allowed for existing licensees to accumulate in the fund the total estimated cost. Obviously there will be many different situations to consider and possibly a case-by-case review needed. However, this is a very significant consideration. A short period for accumulation could present an unreasonable burden for certain licensees.

Based on the one example mentioned in the proposed rule, it appears that the Commission is considering relatively short time periods to accumulate funds for existing licensees. (The example states that if more than 5 years remain prior to license expiration an acceptable period of time would be 5 years or one-third of the remaining license period, whichever is greater.) In our opinion, such short periods are unreasonable and inappropriate. The shorter the time period allowed for accumulation, the greater the cost burden without an associated benefit. For comparison, the EPA regulations for hazardous waste facilities require funds to be accumulated over the initial permit (license) period or the remaining operating life of the facility as estimated in the closure plan, whichever is shorter.

D.6.2.3

- 3) Surety Method or Insurance: Since there is no current competitive market for sureties or insurance specifically for decommissioning, it is difficult to provide constructive analytical comments. However, the very absence of competitive markets is a cause for concern. It is conceivable that applicants/licensees could find themselves at the mercy of a few insurers. This situation could present a serious cost burden for the insured parties, especially for those applicants/licensees who were left with no alternative because of the heavy capital requirements of the prepayment or sinking fund methods.

D.6.4.1.1

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COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

In view of the large size of some of the applicants/licensees, it is also possible that the insured could have higher credit ratings and greater financial resources than the insurer.

We feel self-insurance is a valid means of keeping insurers competitive and reasonable. The higher degree of risk associated with self-insurance is recognized; however, a financial test would be useful in identifying those applicants/licensees for whom self-insurance would be acceptable. Another approach might be to allow a combination of external and self-insurance.

- 4) Internal Reserve: We recognize that this funding method is only permitted for utilities with more than one generating facility because they generally have stable revenue bases and strong financial positions. However, we believe that the determination of funding methods permitted should be based on an evaluation of the financial condition of and the decommissioning cost for the specific applicant/licensee. The evaluation should be based on standard financial test criteria applied consistently to all applicants/licensees, and those that meet the criteria (whether or not they are utilities with more than one generating facility) should be allowed to use the internal reserve method.

D.6.4.1.1

We recognize that the internal reserve alternative could represent higher risk, thus the Commission could restrict use of the internal reserve method to financially strong applicants/licensees whose strength would be determined by a financial test.

ATTACHMENT

COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

The internal reserve method is most desirable because, as the Commission comments, this method is less expensive than an external sinking fund or prepayment since a company can normally earn more from its own capital structure than by investing in higher grade commercial securities outside the company. We believe that the internal reserve method would also be less expensive than a surety method or insurance. This cost differential can be significant. As an example, many companies' average return on capital is significantly better than the current yields on higher grade securities (10-12%). We believe that this differential, plus the additional cost of having an outside administrator of the fund, represents an unnecessary and unjustified cost burden.

There is an added burden for some applicants/licensees related to taxes. The Tax Reform Act of 1984 allows utilities to take tax deductions for payments to decommissioning funds. However, non-utility, non-government applicants/licensees are denied this deduction, thus making their cost burden even greater.

The proposed rule would eliminate the internal reserve as a funding method during an extended decommissioning period (e.g., SAFSTOR). Reasons mentioned are that (a) financial risk would increase once a nuclear facility stops producing revenue, and (b) there would be additional administrative burden on the NRC to monitor an internal reserve during the extended decommissioning period. Regarding these points, so long as a licensee met a financial test, financial risk would not increase and we believe that periodic review would not be burdensome.

D.6.4.1.1

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COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

- 5) Federal, State and Local Government Guarantees: As in the case of the internal reserve method discussed above, we believe that choice of the funding method for any particular applicant/licensee should be based on the ability of that applicant/licensee to satisfy an appropriate standard financial test, rather than as a result of categorizing. We believe there are many private companies that would compare favorably with certain state and local governments in terms of financial condition. We believe that a guarantee should be acceptable for any entity meeting appropriate financial criteria, not just government entities.
- 6) Other Methods: As mentioned above, clarification and specific criteria are needed concerning other methods which would provide comparable assurance. We suggest that objective financial tests and quantification of decommissioning cost in relation to financial resources should be fundamental criteria for measuring "comparable assurance."

D.6.4.1.1

D.6.4.2

We understand that the Commission plans to issue regulatory guides which will address how these funding methods will be implemented. We will be interested in reviewing those guides and will appreciate the opportunity to comment on them. We also believe there would be significant value in having open public comment meetings between the Commission and groups of applicant/licensees on the proposed rule. Such meetings would be very useful in discussing and clarifying the proposed rule, its effects and the possible alternative means of achieving the same objectives.

G.1

ATTACHMENT

COMMENTS ON FINANCIAL ASSURANCE REQUIREMENTS

In summary, we believe greater latitude should be permitted in the methods of providing financial assurance. We believe that the currently proposed rule unnecessarily discriminates against non-utility, non-government applicants and licensees. The allowance of funding methods for applicant/licensees should be based on individual financial condition and ability to meet decommissioning costs, not on arbitrary groupings. Evaluating decommissioning cost in relation to overall financial resources would help quantify the risk of default and help establish appropriate funding methods in view of that risk. The financial tests discussed earlier appear to be a simple, objective means to provide financial assurance in a cost effective manner.

We will be happy to discuss these comments further at the Commission's convenience.

D.6.4.1.1



Mr. Samuel J. Chilk  
May 7, 1985  
NE-85-0190  
Page 2

**B. The \$100 Million Funding Amount Will be Misinterpreted by State Regulators**

The \$100 million funding amount is intended to be an amount sufficient to cover the decommissioning costs for most power reactors. The risk, however, is that such an amount will be viewed as an upper limit or maximum in Rate Case proceedings. In addition, this \$100 million amount may not be sufficient for large commercial reactors that have just recently been put into service. As a result, and contrary to the Commission's intent, the \$100 million funding would, therefore, be inadequate. State Regulators generally require substantiation of all utility costs. The fact that there is a \$100 million certification will not relieve the utility of the burden of cost substantiation. Should the utility cost estimate exceed the \$100 million certification, it will face an enormous burden to rebut the presumption that \$100 million was "sufficient" to cover decommissioning costs. Detroit Edison would urge that the \$100 million amount be eliminated, or, in the alternative, have the Commission provide adequate explanation in the rule to preclude such misinterpretation of the figure. Such explanation might include a statement that the amount is not intended to and does not actually represent the cost a utility might incur in decommissioning a facility.

D.2.1(a)

D2.1(b)

**C. The Proposed Inflation Adjustment Factor of Twice the Consumer Price Index (CPI) is Unrealistic**

The escalation rate of twice the annual CPI rate is arbitrary and may eventually lead to a level of funding that is out of line with the required costs. Such escalations do not account for changes in the technology of decommissioning likely to occur between the time of granting an operating license and decommissioning. It is quite likely that this factor will, like the \$100 million certification amount, be imposed as a presumption that the utility will be forced to rebut in state regulatory proceedings. If retained in the final rule, clarification should be provided as to what the factor is intended to be used for by the NRC.

D2.1(a)

D2.1(b)

Mr. Samuel J. Chilk  
May 7, 1985  
NE-85-0190  
Page 3

D. Specific Aspects of Decommissioning Should Not Be Included in the Operating License of a Facility

Including the specific requirements of decommissioning outlined in the rule as license conditions is likely to result in unnecessary hearings. By including such requirements as license conditions, any change to a decommissioning plan could be viewed as a license amendment and, therefore, subject to the notice and hearing requirements of Section 189a of the Atomic Energy Act. It is apparently the intent of the Commission to eliminate unnecessary hearings and to limit all other hearings, as evidenced by the proposed "Nuclear Power Plant Licensing and Standardization Act of 1985", to those items which could impact the public health and safety. Detroit Edison proposes that the decommissioning requirements not be included as license conditions because they are not safety-related. Decommissioning requirements could be promulgated as regulations which would not otherwise inhibit or limit the enforcement authority of the Commission in this matter. Furthermore, regulations tend to be implemented or interpreted more consistently, whereas license conditions tend to be very site, Region, and Utility-specific, which could result in inconsistent applications.

D.4.4

E. The Rule Should Contain Provisions Addressing Funding Plans Approved by State Regulatory Bodies

Any rulemaking should recognize states such as Michigan that already have decommissioning hearings underway. The funding plan approved by the regulatory body governing the majority of the utility's business should be considered adequate by the NRC. The majority regulatory jurisdiction should have time to implement its order. Consequently, the two year time period provided for submitting information for those plants already holding licenses should apply to all utilities. This would allow for the holding and completion of hearings by the majority regulatory body in the state.

D.8.3.1

Mr. Samuel J. Chilk  
May 7, 1985  
NE-85-0190  
Page 4

Detroit Edison requests that the Commission's proposed rule on Decommissioning Criteria for Nuclear Facilities be modified as discussed in these comments.

If you should have any further questions, please contact Mr. T. Randazzo at (313) 586-4320.

Sincerely,

A handwritten signature in cursive script, appearing to read "Wayne H. Jones". The signature is written in dark ink and is positioned to the right of the word "Sincerely,".

cc: Mr. P. M. Byron  
Mr. M. David Lynch  
USNRC Document Control Desk

PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) 27

MARY Z. SKORAPA, M.D.  
STEVENSTOWN ROAD, R. F. D. 5 A, BOX 317  
GARDINER, MAINE 04345

May 6, 1985

Secretary of the Commission  
NRC  
Washington D.C. 20555

U.S. NUCLEAR  
COMMISSION

85 MAY 10 12:42

OFFICE OF DOCUMENTATION & SERVICES  
BRANCH

Sir:

The proposal to allow the utilities to collect funds for decommissioning nuclear plants from the rate payers in advance and then to invest this money in building new plants is flawed! This must not be allowed. Investment in new plants is not prudent use of the rate payers monies. I favor collecting funds for decommissioning in advance but these should be externally segregated funds which are not controlled by the utilities or invested in utility assets.

D.3.2.1.1(a)

D.3.2.2.1

We have lost trust in the utility companies. We wish to be able to continue to trust their regulators.

Sincerely  
Mary Z. Skorapa

Acknowledged by card May 15 1985

PROPOSED RULES 30, 40, 50 et al  
(50 FR 5600) (28)



P.O. BOX 1178 • MILWAUKEE, WISCONSIN 53201 • TELEPHONE (414) 289-9800 • TELEX 269452

May 7, 1985

DOCKETER  
USNRC

'85 MAY 10 P4:55

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

OFFICE OF  
DOCKETING & SERVICE  
BRANCH

ATTN: Docketing and Service Branch

Dear Sir:

RE: Nuclear Regulatory Commission, 10 CFR Parts 30, 40, 50, 51,  
70 and 72, Decommissioning Criteria for Nuclear Facilities

We are writing to express our comments on the NRC proposed amendment "Decommissioning Criteria for Nuclear Facilities."

We are a 55-person operation with one location in Milwaukee. We prepare primarily thorium chemicals from imported raw material from Canada. We also prepare a very small amount of depleted uranium chemicals. Our processes generate no liquid wastes which cannot be adequately discharged into our normal sewer system. All solid waste material is properly compacted and sent out for burial at approved sites. Such solid wastes may total only 25-50 fifty-five gallon drums over a 2-3 year period.

Our in-house safety program, supervised by a Safety Official and an assistant, involves constant monitoring of air, water, surface contamination and employee exposure. Any spills or other possible contamination from broken crucibles, ruptured furnaces, etc., are immediately cleaned up, and all areas totally decontaminated. Thus, for all practical purposes, our facility is always within acceptable NRC levels for exposure to thorium and the very small amount of depleted uranium work we might do.

We already have an effective plan for disposing of any inventory or waste material and have invested considerable funds in our Safety Program.

If we ever vacated our present facility (which we have no long-range plans to do; in fact, we are contemplating an expansion), it would be very simple and quick for us to demonstrate a safe environment for subsequent users of the premises.

Under NRC regulations contained in Part 40 of the Code of Federal Regulations, we are required to keep records of inventory and document any spills or other incidents of contamination. We have invested considerable sums in monitoring equipment, compaction apparatus and disposal services to stay in daily compliance with all NRC regulations. In addition, we spend additional amounts of

Acknowledged by C.M.J. 5/10/85

D.6.4.1.1

Office, Plant and Laboratory 407 No 13th St Milwaukee, Wisconsin 53233  
Metal, Alloy and Ceramic Powders Hot-Pressed Parts CERAC/PURE Inorganic Chemicals & Custom Syntheses

Secretary of the Commission  
Page 2  
May 7, 1985

money to have our entire radioactive materials program supervised by expert consultants in the Chicago area. Our inventory of source materials does not present a major problem should decommissioning become necessary, since our current program provides for removal of all source materials and burial in approved sites. Any additional financial outlays for long-range decommissioning bonds or similar guarantees would impose unnecessary financial burdens on our small business in which source material sales constitute a small portion of our overall income. However, we feel a moral obligation to continue the production of certain source materials since we are now the sole U.S. manufacturer of some products which have military importance.

D.6.4.1.1

By imposing additional financial burdens on a small business, we cannot plan needed expansions. If the burdens became intolerable, we conceivably might have to suspend radioactive materials production and leave the military and some government laboratories, such as Argonne, without a domestic producer of critical chemicals.

We would respectfully propose including in any future decommissioning criteria a statement such as follows: Any company producing radioactive materials as controlled by the NRC, and having 150 or fewer employees, who have a demonstrated and active program to control source material spills and waste disposals and are engaged in such program as demonstrated by periodic NRC inspections, is exempt from any financial bond posting as long as they successfully pass all NRC inspections.

The public in general, and all employees specifically, would be totally protected from any radioactive harm under such a well monitored program.

We urge you to provide this requested financial relief for all small companies. We deeply appreciate the opportunity of expressing our concern.

Very truly yours,



Ervin Colton  
President

Dr. E. Colton/pl

cc: Standard Nuclear Consultants, Ltd.

PROPOSED RULES R-30,40,50 et al  
(50 FR 5600) (29)

UNITED STATES OF AMERICA  
BEFORE THE  
NUCLEAR REGULATORY COMMISSION

DOCKETED  
USNRC

In Re Decommissioning Criteria  
for Nuclear Facilities - Proposed  
Amendments to 10 CFR Parts 30, 40,  
50, 51, 70 and 72

'85 MAY 13 A9:56

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

COMMENTS OF THE STAFF  
OF THE PENNSYLVANIA  
PUBLIC UTILITY COMMISSION

Introduction and Summary

The Staff of the Pennsylvania Public Utility Commission ("Staff") hereby submits its comments in connection with the Nuclear Regulatory Commission's ("NRC") proposed amendments to its regulations regarding the technical and financial criteria for decommissioning nuclear facilities. Generally the Staff supports the proposed rule. The specific observations and positions of the Staff are as follows.

The PaPUC Staff supports the NRC's implicit determination to continue to allow state regulatory authorities to decide issues relating to the ratemaking impact of decommissioning fund accumulation. We support the use of plant history documentation to lessen the eventual cost of environmental analysis. These elements of the proposed regulations are very much in the public interest and should be maintained.

The Staff opposes the use of a 25 percent contingency factor as well as a doubled Consumer Price Index escalator.

G.1  
D.8.3.1  
C.7.1  
D.8.3.1  
D.1.1.4  
D.2.1(a)

ADMITTED TO FILE BY \_\_\_\_\_ 1985 pd

A contingency factor is unnecessary and a more relevant escalator would be the Implicit Price Deflator for Gross National Product.

D.1.1.4  
D.2.1(b)

The proposed \$100 million fund should not apply to both Boiling Water Reactors ("BWR") and Pressurized Water Reactors ("PWR"). The contaminated portion of a BWR is more extensive than that of a PWR. A further differentiation should be made with respect to the amount of the fund between pre and post TMI units. A significant difference in the amount of contaminated material (steel and concrete) will exist for these types of units upon decommissioning. The benchmark suggested in the proposed regulations assumes decommissioning of a Post TMI type unit.

D.2.1(b)

Amounts collected for an internal reserve fund should be held in escrow and not available to the utility for general corporate investment purposes.

D.3.2.1.1(a)

Contingency Factor

The 25 percent contingency factor proposed in the regulations is unnecessary. The Pennsylvania Public Utility Commission has recently disallowed this type of claim in connection with Pennsylvania Power & Light's Susquehanna 2 nuclear facility. A 25 percent contingency level is far in excess of the amount budgeted for contingencies in construction of nuclear generating units. For example, Philadelphia Electric Company's construction contingency level is 7 percent for Limerick 2.

D.1.1.4

The Staff anticipates that accumulated experience with decommissioning, workforce specialization and competition among decontamination firms will reduce actual decommissioning expense below the level currently anticipated.

D.1.1.4

CPI Escalator

The proposed escalation factor of 2 x's the Consumer Price Index is excessive. This index tracks the price of many goods that are unrelated to the decommissioning process. In Pennsylvania, the Implicit Price Deflator for Gross National Product is used to track the effects of inflation when financial projections are utilized. Again, given the economies in the decommissioning process that Staff believes will accrue, the price deflator is a more reasonable escalator to use than a doubling of the CPI.

D2.1(a)  
D2.1(b)

BWR's versus PWR's

Staff submits it is well accepted that Boiling Water Reactors inherently include a larger contaminated area than Pressurized Water Reactors. In setting the amount of a decommissioning fund that must be accumulated, this difference should be taken into account.

D.2.1(b)

Pre versus Post TMI Units

In setting the level of funding for decommissioning, a distinction should be made between pre and post TMI units. Given the additional steel and concrete mandated after TMI in construction, a significant difference in the tonnage of contaminated material can be expected. The benchmark relied upon for the proposed regulations is a post-TMI unit. The level of funding should be adjusted for pre-TMI units.

D.2.1(b)

Internal Reserve Option

The Staff recognizes that in cases where funding is accumulated through an internal reserve that investment at the discretion of the utility can enhance the size of this fund over time. However, given the importance of the purpose to which these funds will be expended - decommissioning of nuclear facilities - additional assurance that the funds will be available when needed is necessary. Consequently the Staff recommends that the funds should be maintained in escrow.

D.3.2.1.1(a)

Conclusion

With the exceptions mentioned above, the Staff of the Pennsylvania Public Utility Commission supports the proposed regulations for decommissioning. The modifications

G.1  
D.8.1

we propose would be in the interest of utilities and  
ratepayers.

| G.1  
| D.8.1

Respectfully submitted,

  
John F. Povilaitis  
Deputy Chief Counsel

For the Staff of the Pennsylvania  
Public Utility Commission

Dated: May 10, 1985



SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, PO Box 15830, Sacramento CA 95852-1830, (916) 452-3211  
 AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

PROPOSED RULE FR-30, 40, 50, et al  
 (50 FR 5600) (30)

May 10, 1985

DOCKETED  
 5/13/85

'85 MAY 13 P2:15

SECRETARY OF THE COMMISSION  
 U.S. NUCLEAR REGULATORY COMMISSION  
 WASHINGTON DC 20555

U.S. NUCLEAR REGULATORY COMMISSION  
 WASHINGTON

ATTN: DOCKETING AND SERVICE BRANCH

PROPOSED RULE: DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES.

The purpose of this letter is to provide a summary response from the Sacramento Municipal Utility District (SMUD) to the Commission's invitation to comment on the proposed amendments as published in the Federal Register of February 11, 1985 (Vol. 50, No. 28).

SMUD is an independent, community-owned electric utility district established under the California Municipal Utility Act. The District is the sole owner and operator of a 913 MW pressurized water, nuclear-fueled, generating plant and is a NRC licensee under 10 CFR Part 50.

SMUD has maintained an internal sinking fund for the eventual decommissioning of the nuclear facility since January 1980. These collected funds are segregated within SMUD's investment portfolio. The "facility-specific" decommissioning cost estimate is \$117 million in 1984 dollars and is based on the DECON alternative. At April 30, 1985, funds set aside for decommissioning totaled \$29.2 million. The fund is reviewed and adjusted annually to reflect the latest practices of decommissioning and to provide for inflation.

In general, we agree with the proposed amendments and the importance of assuring that decommissioning is accomplished in a safe and timely manner and that the licensee has adequate funds available for such purpose. Furthermore, we believe that SMUD's present decommissioning funding method will generally satisfy the NRC's two "primary" evaluating criteria; namely, providing

D.8.1  
 G.1

Acknowledged by SMUD 5/13/85

*pd*

May 10, 1985

adequate "assurance of the availability of funds" and that the cost of providing assurance is "reasonably cost effective".

G.1

Following are SMUD's specific concerns and comments as they relate to the major issues addressed in the proposed rule: Timing, Planning, and Financial Assurance. These comments focus on the impact the proposed amendments pose to both SMUD and we believe, on a larger scale, to the municipal electric utility industry.

#### TIMING

SMUD agrees that, given optimum conditions, decommissioning should begin shortly after cessation of operations. However, in the interest of reducing occupational exposure and the radioactive waste volume, a utility may choose the decommissioning alternative SAFSTOR, thereby delaying the completion of decommissioning.

B.4.2

Given this scenario, §50.82(c)(1) requires that decommissioning funds be placed into a segregated account "outside the licensee's administrative control". The stated rationale for such action is so that "for a facility which is no longer producing revenue, the funds would be protected irrespective of licensee stability".

SMUD disagrees with the provisions of this section since determination of a utility's "stability" involves case-by-case considerations. For instance, SMUD maintains multiple generation facilities, power purchase contracts, as well as extensive transmission and distribution facilities. Consequently, its revenue producing capability and financial stability is not wholly dependent on the nuclear generating facility. Therefore, we recommend the provision compelling the transfer of decommissioning funds to an external account be invoked only where it is determined, on a case-by-case basis, that the utility's financial stability is in jeopardy. This will also serve to eliminate excess administration costs to current ratepayers who are no longer benefitting from the plant.

D.3.4

PLANNING

SMUD concurs with the provisions of the proposed rule relating to the informational and technical content of decommissioning plans. In particular, we agree that development and submission of a "detailed plan" should occur near final shutdown. We also agree that the "preliminary plan" is properly limited in its scope by providing information relevant only to the licensees' proposed "decommissioning funding plan".

C.2.2

C.2.1

The required funding plan information is readily available to utilities such as SMUD which have independently defined a decommissioning plan and (currently) maintain a corresponding fund. For utilities without a previously established decommissioning plan, the allowable two-year time period for compliance is reasonable.

D.4.1.1

FINANCIAL ASSURANCE

The stated criteria the NRC staff considers in evaluating a proposed funding plan are 1) the degree of assurance of the availability of the funds, and 2) the cost of providing assurance. Following are SMUD's comments concerning these criteria as they relate in their application to SMUD (and other municipal electric utilities).

Degree of Assurance

. The NRC contends that "the internal reserve is vulnerable to events or situations that undermine the financial solvency of a licensee" and, therefore, provides less assurance than the external sinking fund. However, the NRC should recognize the fact that a municipal utility's internal reserve provides a level of assurance equal to that of an external sinking fund.

D3.2.1.1(b)

A municipal utility district, as compared to private enterprises, is precluded from bankruptcy in the "normal" sense. Instead, the Bankruptcy Code allows for a "municipal reorganization" where the municipal's liabilities and obligations are eventually repayed. Because of this unique condition, the question is not "if" the obligations will be satisfied but, rather, "when". The stability of the municipal utilities is evidenced by the fact that external decommissioning funds of investor-owned utilities are invested in low-risk, municipal bonds. <sup>1/</sup> Thus, a municipal utility investing in an external sinking fund could, theoretically, have its fund contributions reinvested in its own bonds. Given this fact, with respect to a municipal utility, either funding method is subject to the same risk. That is, a municipal utility's internal fund provides substantially the same degree of assurance as to future availability as would an external fund.

D.3.2.1.1(b)

. The internal reserve funding mechanism should not be limited to an "electric utility owning more than one generating facility" (§50.33(k)(4)(iv)). Such restriction implies that the utility's ability to generate revenue and, thus, cover the cost of decommissioning, is entirely dependent on its (one) generation plant. This assumption overlooks several factors as follows:

- 1) The utility's rate-setting body or regulator has the power to create an asset and corresponding revenue to recover the cost of decommissioning. The regulator exercises this power irrespective of the "quantity" of generation facilities maintained by the utility.

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<sup>1/</sup> CPUC Decision 83 04 013, pg. 50, April 6, 1983. California Public Utilities Commission's investigation into present and alternative methods of financing decommissioning costs.

- 2) Prudent utilities build, or contract for, power supply sources beyond their requirements to provide capacity upon loss of their one generating facility. Therefore, the utility is able to maintain its revenue stream even in the event of the loss of their generating facility.
  
- 3) Utilities maintain substantial investment in transmission and distribution facilities. These facilities represent property against which bonds could be issued to pay for decommissioning. (The amount of property available for funding could be monitored as described under Funding.)

D.3.2.1.1(b)

Cost of Providing Assurance

When evaluating the cost of a funding method, the proposed rule fails to consider the differences between public vs. investor-owned utilities (IOU's). Unlike IOU's, municipal utilities are exempt from income taxes. Compounded over the life of the funding mechanism, even small differences in the earning rate have major effects on the assumed present value cost of a funding alternative. Consequently, the present value cost of a funding mechanism used by SMUD would be significantly lower than that of the same mechanism used by an IOU (since the "effective" earning rate is greater for SMUD). As a result, the comparative "incremental revenue requirements that result from using a particular funding method" would be less for a municipal utility than for the IOU.

D.3.3.5

Funding Methods

Section 50.33(k)(1) states "an electric utility may submit either a proposed decommissioning funding plan or a certification . . ." The proposed rule is not definitive as to the difference between a plan and a certification. Therefore, we recommend that the final rulemaking contain a more explicit definition of a "certification" and the criteria which must be met under a "certification".

D2.1(b)

Also, annual adjustments are prescribed at twice the Consumer Price Index. Does this preclude the use of other indices which similarly indicate inflationary activity? If not, might other indices (such as Chase Econometrics, GNP Deflator, Handy Wittman, etc.) be substituted?

D2.1(b)

Section 50.33(k)(2)(iv) allows a utility to use an internal reserve which is not segregated from licensee assets. The funds are invested in other assets and, ultimately, bonds are issued against these assets to pay for decommissioning.

In effect, the assurance that funds will be available is provided through the bonding capability of the licensee's assets.

Therefore, it should be required that, where the licensee maintains an unsegregated internal reserve, a periodic report as to the utility's bonding capability be filed with the Commission. In the case of a utility whose primary source of financing is through the issuance of mortgage bonds, the utility should be required to file a report showing the level of property additions available for funding (such as under a trust indenture). This would provide assurance that bonds could be issued against these assets at the time of decommissioning and that said assets were not pledged (as collateral) in support of previous bond issues. In the case of a utility whose primary source of financing is through the issuance of general system bonds (such as a municipal utility) the utility should be required to file a report demonstrating that revenues will be sufficient to support additional debt such as the "Accountant's Certificate" which includes the calculation of debt-service coverage ratios.

D.3.2.1.2

#### CRITERIA FOR APPROVING FUND PLANS

The criteria for approving a facility-specific decommissioning plan are sufficiently described in the proposed rule for purposes of theoretical illustration. However, we suggest that the final rule contain a more specific

D2.1(c)

May 10, 1985

or quantitative description of the NRC's criteria for approving proposed funding plans.

| D2.1(c)

CONCLUSION

In summary, we recommend that the Commission:

- . determine on a case-by-case basis the need for transferring the decommissioning fund to an external account when the decommissioning alternative includes a period of storage.
- . recognize that a municipal utility's internal reserve provides a level of assurance equal to that of an external fund.
- . not restrict the use of the internal reserve mechanism to electric utilities owning more than one generating facility.
- . consider the differences between public and investor-owned utilities as they affect the "cost of providing assurance".
- . further define the term "certification" and its related criteria as used in §50.33(k)(i).
- . consider the appropriateness of indices other than the Consumer Price Index for annual fund adjustments.
- . where internal reserve funds are invested in the licensee's assets (not segregated), require a periodic report which certifies the bonding capability of these assets.
- . state the criteria for approving facility-specific decommissioning plans in more definitive terms.

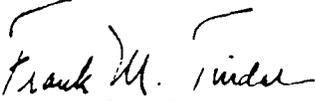
Secretary of the Commission

-8-

May 10, 1985

SMUD appreciates the opportunity to submit the above comments for the Commission's consideration.

Respectfully Submitted,



Frank M. Tindal  
Controller  
Sacramento Municipal  
Utility District

50 FR 5600-30, 40, 50 et al  
(50 FR 5600) (31)



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DOCKETING  
SERVICE  
BRANCH

'85 MAY 13 P2:15

OFFICE OF THE  
DOCKETING AND  
SERVICE  
BRANCH

May 10, 1985

Docket Nos. 50-213  
50-245  
50-336  
50-423

511535

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Att: Docketing and Service Branch

Gentlemen:

Haddam Neck Plant  
Millstone Nuclear Power Station, Unit Nos. 1, 2 and 3  
Decommissioning Criteria for Nuclear Facilities;  
Proposed Rule (50 FR 5600)

On February 11, 1985, the NRC published in the Federal Register (50 FR 5600) for public comment a proposed rule which would provide decommissioning criteria for nuclear facilities. The comment period expires May 13, 1985.

As licensees of the Haddam Neck Plant and the Millstone Nuclear Power Station, Unit Nos. 1, 2 and 3, respectively, Connecticut Yankee Atomic Power Company (CYAPCO) and Northeast Nuclear Energy Company (NNECO) hereby submit our comments in response to the Federal Register notice. Our general comments are attached. It should be recognized that adoption of some of our general comments could require revisions to the proposed rule. We have not provided alternate wording for each of our general comments. However, we would be willing to discuss potential alternate wording with the NRC Staff regarding any of our comments.

ASKING ATTORNEY  
MAY 10 1985  
pa

Our staff has been active in the area of decommissioning for many years. We have participated at decommissioning conferences as speakers and session chairmen. We have also been active and have leadership roles with the Utility Decommissioning Group and the AIF Subcommittee on Decommissioning. In addition, representatives from NU presented the industry's viewpoints before the Commission on September 20, 1984. We therefore have a great deal of interest in the proposed rule and future regulatory guides, and in seeing that they provide utilities with the guidance to perform the planning, funding and ultimate dismantlement of our nuclear facilities.

Overall, NU compliments the NRC for the thorough job they have done in drafting this proposed rule after extensive research and gathering background information. We are especially pleased with the permitted use of the internal funding mechanism for multi-asset utilities, which would provide sufficient assurance of funds at the time of decommissioning. We applaud the NRC for their statement that "Based on an analysis of the technical data base, decommissioning can be accomplished safely and at reasonable cost shortly after cessation of facility operation" (50 Fed. Reg. at 5603, Col. 3). This statement certainly echoes the utilities' position on decommissioning. Finally, we agree with the NRC that there is no need to prepare an environmental impact statement since the costs and environmental impacts at the time of decommissioning are small compared to the total costs and impacts of building and operating a nuclear power station (see 50 Fed. Reg. at 5610, Col. 1).

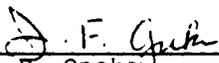
D. 8. 1

G. 1

F. 1

We appreciate the opportunity to comment on the proposed rulemaking. We would be pleased to discuss our comments at your convenience.

Very truly yours,  
CONNECTICUT YANKEE ATOMIC POWER COMPANY  
NORTHEAST NUCLEAR ENERGY COMPANY

  
\_\_\_\_\_  
John F. Opeka  
Senior Vice President

Docket Nos. 50-213  
50-245  
50-336  
50-423

ATTACHMENT

HADDAM NECK PLANT  
MILLSTONE NUCLEAR POWER STATION, UNIT NOS. 1, 2 AND 3

General Comments on the Proposed Rule  
Regarding Decommissioning Criteria for Nuclear Facilities

May, 1985

GENERAL COMMENTS ON THE PROPOSED RULE ON DECOMMISSIONING

1. The \$100 Million Certification Alternative

One major concern that we have with the rule is the statement on 50 Fed. Reg. at 5606, Col. 3 which effectively states that \$100 million (1984 dollars) is sufficient to cover decommissioning costs for most licensees (emphasis supplied). We feel that this statement is incorrect, and conveys an incorrect impression to the public, to regulators and others. First of all, decommissioning a large nuclear power plant (1150 MWe) will cost substantially more than \$100 million in 1984 dollars. Numerous decommissioning studies, as well as our own Millstone Unit 3 estimate, indicate that \$150-\$170 million is a more realistic cost estimate. Second, the proposed rule does not indicate whether the \$100 million estimate includes a contingency, whether it is for a BWR or PWR, its applicability to a large or small nuclear plant, impacts of plant location, or the decommissioning method that is assumed. (NU estimates entombment with delayed dismantlement to cost approximately \$200 million for Millstone Unit 2, an 870 MWe PWR). Third and most important is that state and federal rate regulators could use the \$100 million estimate as a ceiling on rate recoveries for decommissioning, even in cases in which the utility provides a valid site specific study demonstrating that decommissioning costs will be substantially higher. Rate regulators throughout the country and the FERC have relied on the out-of-date Battelle Decommissioning Studies (NUREG/CR-0130 and -0672) for cost estimates and have not included the substantial increases in waste disposal costs as well as other costs not included in the Battelle studies.

The reason for our concern is the risk that public utility commissions and the FERC could rely on the NRC's statement that \$100 million is sufficient to keep decommissioning cost recovery to an unrealistically low level, thus leading to inadequate decommissioning funding, and thereby frustrating the very financial assurance that the NRC is seeking to provide. Stating that \$100 million will provide sufficient funds to cover the costs of decommissioning could effectively put a limit on the amount a utility can recover from its customers even though a site specific study indicates much larger costs will be incurred.

The NRC and NU seek the same results from this rulemaking; having the appropriate level of funds to cover decommissioning costs at the time of plant retirement. Use of this \$100 million generic estimate could inhibit rate recovery of the higher amounts that a site specific study might demonstrate are necessary for particular units. It should also be noted that site specific decommissioning cost studies are required by many state regulators and in some cases state statutes, regardless of the certification option of the proposed rule.

D.1.1

D.2.1(a)

D.2.1(b)

D.2.1(a)

With regard to the certification option, a utility corporate officer will not guarantee a certain rate of recovery over the life of the nuclear plant since that power rests with rate regulators. Therefore, the certification option is not a viable alternative for investor-owned utilities.

D2.1(a)

2. Inflation Adjustment

Our comments concerning the \$100 million certification amount also apply to the inflation adjustment in the proposed rule. The rule proposes an inflation adjustment of twice the Consumer Price Index (see 50 Fed. Reg. at 5602, Col. 2). Waste disposal costs have increased at a much higher rate than twice the CPI. Between 1978 and 1984, waste disposal costs at Barnwell have increased over 1300% for low level wastes, while the CPI has increased only 63%. The proposed inflation adjustment could be used inappropriately by rate regulators to hold down the recovery of decommissioning costs. Most utilities, including NU, revise their decommissioning cost estimates periodically for rate case submittal. This automatically provides the appropriate adjustments in the cost estimate to reflect current increases or decreases in labor, materials and waste disposal fees.

D2.1(a)

D2.1(b)

3. Funding Plans and Recordkeeping Imposed As Conditions of the Operating License

Another concern with the proposed rule is the imposition of the submission of decommissioning funding plans and record keeping as express conditions of the operating license. These requirements should not be imposed as license conditions since they may result in unnecessary formal hearings which will involve substantial manpower requirements for both the licensee and the NRC Staff. In addition, the level of detail specified in Sections 50.54 (dd) (1) and (2) is excessive. Adequate provisions (1) are already in place which cover records of spills and as-built drawings, so that further documentation requirements are not necessary. Since this issue is not safety related and the NRC can enforce decommissioning funding and record keeping requirements by regulation rather than license condition, we strongly recommend that the NRC delete these requirements from the operating license.

C.7.2

D.4.4

C.7.1

C.7.2

D.4.4

4. Use of Generic Decommissioning Studies

The proposed rulemaking states that "The PNL decommissioning studies can be used for initial estimates with suitable adjustments for inflation and for site specific factors." (see 50 Fed. Reg. 5604, Col. 3). The use of these generic studies for developing decommissioning cost estimates tends to

D1.1.1

(1) See, for example, Section 6.10 of Standard Technical Specifications

greatly understate the true cost of decommissioning when compared to recent site specific studies. Such a reference makes rate commission approval of higher site specific cost estimates a much more difficult task. NU therefore recommends that you delete any reference to the use of the PNL decommissioning studies for cost estimates. In its place, we urge you to endorse the AIF's National Environmental Studies Project which has developed decommissioning cost estimate guidelines which will be published within the next several months. The task force that developed these guidelines includes representatives from the NRC Staff, National Association of Regulatory Utility Commissioners, EPRI, vendors, engineering and financial consultants and licensees. The development of site specific decommissioning studies through the use of these guidelines support the common objective of the NRC and the utilities to adequately fund decommissioning during the operating life of the nuclear plant.

D2.1(a)

D1.1.1

5. Raising Funds to Pay for Decommissioning

In the description of the internal reserve funding method mentioned on 50 Fed. Reg. at 5607, Col. 2, NU recommends that the following statement be deleted from the proposed rulemaking. "At the end of the nuclear facility's life, bonds are issued against these assets and the funds raised are used to pay for decommissioning." While this approach may be one option available to the licensee, other options also exist for raising the necessary funds to pay for decommissioning. In fact, large utilities may simply pay for decommissioning through normal cash flow from operations. Moreover by restricting the options available, the degree of assurance that funds will be available when needed is reduced.

D3.3.3

6. Internal Versus External Funding

Throughout the proposed rulemaking, the NRC indicates that internal funding methods provide reasonable assurance for multi-asset utilities. NU concurs with such a conclusion. However, we believe that the statements that external funding provides greater levels of assurance, are misleading. First, it must be recognized that certain factors which pertain to external funding, do not impact internal funding. Possible reduction in market value of the securities held by the external fund, as well as the financial soundness of the institution that holds the fund are risks that are specific to external funds. Second, the ratemaking process is intended to assure utilities' long-term financial integrity by allowing for the recovery of all prudently incurred costs, and decommissioning is such a cost. In fact, Professor Siegel, consultant to the NRC, concluded that internal funding provides excellent assurance of the availability of funds. Finally, in contrast to external funding, internal funding actually improves the utility's financial position by increasing the ability to generate funds internally and by reducing the need for external financings.

D3.2.1.1(b)

7. Incentive to Collect Funds for Decommissioning

Commissioner Bernthal has suggested in his comments that utilities have no incentive to collect, in advance, funds for decommissioning. See Fed. Reg. at 5611, Col. 1 - Separate Views of Commissioner Bernthal.

"Absent the proposed decommissioning regulations, no such incentive would exist to dedicate funds in advance for successful completion of decommissioning."

This belief, which is shared by many, we believe is not true. The incentive is inherent in the ratemaking process, both for the utility and its ratemaking agency. For utilities, the ratemaking process requires that costs associated with a facility be recovered from ratepayers over the life of the facility to avoid intergenerational inequities between ratepayers. For ratemaking agencies, the incentive is even greater, since they are required to protect both the financial integrity of the utilities (primarily cost recovery) and that of the consumer (that the funds collected for decommissioning will be available for decommissioning). It is our opinion therefore, that utilities and rate regulators already have an incentive to dedicate funds in advance for decommissioning and that Commissioner Bernthal's premise is simply not true.

D.3.2.1.1(b)

8. Possibility of Insolvency

With regard to the request of Commissioners Asselstine and Bernthal for public comments on the need to consider the possibility of insolvency and its impact on the continued availability of decommissioning funds (see 50 Fed. Reg. 5609, Col. 1), the following comments are offered: The financial history of electric utilities has been extremely stable over the past 50 years with no recorded bankruptcies. However, even under the assumption that a utility might go bankrupt, they do provide an essential service. Some surviving entity would be asked to continue to provide that essential service, and whoever takes that responsibility would be required to honor the obligation to decommission such facilities.

PROPOSED RULE 1 *PR-30, 40, 50 et al*  
*(50 FR 5600) (32)*

PHILADELPHIA ELECTRIC COMPANY

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RECEIVED  
MAY 10 1985

85 MAY 13 P2:14

JOSEPH F. PAQUETTE JR., PRESIDENT  
FINANCE AND ACCOUNTING DEPARTMENT

May 10, 1985  
OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
United States Nuclear Regulatory Commission  
Washington D. C. 20555

Attention: Docketing and Service Branch

Re: Proposed Decommissioning Criteria for Nuclear Facilities

Gentlemen:

In response to your call for comments on a proposed rulemaking on Decommissioning Criteria for Nuclear Facilities as published in the Federal Register (50 F. R. 5600, February 11, 1985), Philadelphia Electric is pleased to have the opportunity to present the following for your consideration:

1. Within the regulatory jurisdiction of the Pennsylvania Public Utility Commission, revenue allowances for the funding of decommissioning reserves are typically based upon the cost to decommission what is defined as the "nuclear portion" of a power production facility. Hence, only a portion (approximately one half) of a nuclear power production facility is currently afforded rate treatment for decommissioning reserve funding purposes.

In the background section of the Notice of Proposed Rulemaking, the term "nuclear facilities" is stated, for purposes of the proposed rulemaking, as "the site, buildings and contents, and equipment associated with any NRC licensed activity". In order to assure that the decommissioning goal of the proposed regulations is achieved (i.e. reduction of radioactivity to a level that permits release of the property for unrestricted use), Section 50.2 of the Commission's Regulations should be amended to include a definition of "nuclear facilities" similar to the definition in the background to the proposed rule.

2. Section 50.33 (2) (ii) defines the external sinking fund financial assurance provisions. It calls for "... deposits plus accumulated earnings ... sufficient to pay decommissioning costs at the time of termination of expected operation". As a result of construction and licensing constraints, multi-unit nuclear generation facilities can have individual operation dates separated by a number of years. In such cases decommissioning is impractical prior to the termination of

B.1.2.1

D.4.6.2

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Acknowledged by: *[Signature]*

operation of the last unit at the site. Section 50.33 (2) (ii) should be modified to allow for the collection of the total decommissioning cost for all units at one site to be complete with the termination of operation of the last generating unit at that site.

D. 4. 6. 2

3. Section 50.33 (2) (ii) defines an external sinking fund as being " a fund established and maintained by the periodic deposit of a prescribed amount into a account ...". By limiting the external funding option to a sinking fund methodology, the proposed regulations unnecessarily prohibit other equally reliable methods of maintaining an external fund. In the case of Philadelphia Electric Company, the Pennsylvania Public Utility Commission has allowed the Company an external fund maintained on a constant dollar basis. Payments to this fund are based on estimates of current decommissioning cost supplemented by a correction to account for the effect of inflation on prior accruals. It is the opinion of the Company that this methodology is better suited to an external decommissioning reserve than is the sinking fund methodology inasmuch as no estimates of either future decommissioning costs or future earnings and inflation rates are required using the constant dollar methodology. The provisions of proposed section 50.33 (2) (ii) should be expanded to allow for the maintenance of an external fund utilizing any fiscally responsible funding basis which achieves the stated objective.

D. 3. 3. 1

Philadelphia Electric Company appreciates this opportunity to comment on the proposed rulemaking associated with Decommissioning Criteria for Nuclear Facilities. Please feel free to contact me should you have any questions related to these comments.

Sincerely,



29125

DOCKET NUMBER  
PROPOSED RULE PR-30-4450 et al  
(50 FR 5600) (33)

May 10, 1985

Secretary of the Commission  
Docketing and Service Branch  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

DOCKETED  
USNRC

Comments of Ohio Citizens for Responsible Energy ('OCRE') on  
Proposed Decommissioning Rule, 50 FR 5600

MAY 13 1985 P2:41  
OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

The Commission's proposal on decommissioning has serious  
deficiencies which must be rectified before it can be considered  
acceptable.

The proposed rule greatly underestimates the cost of  
decommissioning and permits the use of unreliable funding  
mechanisms. The Commission apparently considers \$100 million  
adequate to cover decommissioning costs. There is no reliable  
basis for this sum. No large reactors have ever been  
decommissioned. The closest we have come is the TMI-2 cleanup  
costing over a billion dollars, the funding for which is still  
uncertain and precarious. There is always a danger in  
projecting costs 20-40 years into the future. Twenty years ago  
no one dreamed that a 1200 MW power plant would cost \$6 billion  
to build. Similarly, the costs of decommissioning such large  
plants decades into  
the future are greatly underestimated. The only logical cost  
estimate is to assume that decommissioning costs will be about  
equal to the costs of constructing the plant.

The proposal states that "even financially troubled utilities  
have sufficient assets to cover the costs of decommissioning."  
50 FR 5608. The facts suggest otherwise. The TMI licensee has  
not been able to cover the cleanup costs alone. Commonwealth  
Edison has used its decommissioning fund to help pay for the  
construction of new nuclear plants. Many utilities have  
abandoned nuclear plants under construction because of financial  
troubles. These events demand that decommissioning funds be  
kept separate from other utility assets in a manner such that  
they cannot be claimed by creditors.

The proposal also needs to be clarified as to what type of  
license will govern the decommissioning of a nuclear power  
plant. This needs clarification, as there must be an  
opportunity for meaningful public participation in  
decommissioning decisions.

The proposed rule also needs to set forth criteria for  
acceptable practices and standards for decommissioning,  
including residual radioactivity levels, such as the general  
design criteria and quality assurance standards of Appendices A  
and B to Part 50 that govern plant design, construction, and

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D3.2.1.1(a)

C.1.1

C.1.3

E.1.1

C.6

MAY 15 1985  
Acknowledged by card.....

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Page 2

operation. There are no clear criteria for choosing among the three methods of decommissioning. Likewise, no quality assurance standards are proposed.

|B.3.1.1  
|C.4

Finally, the proposal violates the National Environmental Policy Act in that it relies upon an inadequate and outdated Draft Generic EIS and requires no site specific decommissioning environmental review. The consideration of decommissioning presented in the licensing-phase environmental statements are supposed to be sufficient. This is unsatisfactory, since the knowledge of decommissioning methods and effects are so uncertain at the licensing stage that an attempt to evaluate them then is meaningless. A full environmental review of decommissioning, before it is begun, in accordance with NEPA, considering costs and benefits of various methods, must be included.

|F.1

Respectfully submitted,

*Susan L. Hiatt*

Susan L. Hiatt  
OCRE Representative  
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DOCKET NUMBER  
PROPOSED RULE PR-3040,50 et al  
(50 FR 5600) (34)



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L CLARK JR  
Director of Reactor Operations

85 MAY 13 P2:41

May 7, 1985

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
Attn: Docketing and Service Branch  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: Proposed Decommissioning Rule (50 FR 5600-5625)

Dear Sir:

The Nuclear Reactor Laboratory of the Massachusetts Institute of Technology has reviewed the proposed decommissioning rule published on February 11, 1985 in the Federal Register (50 FR 5600-5625). We have also reviewed the comments being submitted by the National Organization of Test, Research and Training Reactors, as prepared by Mr. A. Francis DiMeglio, Chairman, and wish to endorse his letter.

As we interpret the proposed rule, MIT would be required within two years after the effective date to prepare and submit to NRC a decommissioning funding plan for its research reactor containing a decommissioning cost estimate which, on approval by NRC, would constitute the amount of financial assurance that the Institute would be required to provide. This places research reactor licensees in a disadvantageous position in that most other licensees may delay or avoid submission of a funding plan by certifying that financial assurance in an amount specified in the rule has been provided. In particular, it places MIT, and a few others, at a disadvantage in that most NRC-licensed research reactors are operated by state universities or federal agencies, which have the option of certifying that decommissioning funds will be guaranteed.

D.3.2.4

The Federal Register notice states that decommissioning alternatives and their acceptability will be the subject of a revision to Regulatory Guide 1.86 on the termination of licenses for nuclear reactors and of a similar document for other facilities. The notice also indicates that criteria for the permissible levels of residual radioactivity necessary for release of a facility to unrestricted use are still subject to separate rulemaking action. Furthermore, the availability and location of burial sites and the costs of disposing of radioactive waste are in a great state of flux. All of the above make the estimating of decommissioning costs for a decommissioning funding plan a very difficult, time-consuming, and uncertain task.

D.1.1.1

MAY 15 1985

Acknowledged by card.....  
pa

In view of the above, the following two recommendations are submitted:

- 1) Well capitalized, firmly established private organizations should be permitted to guarantee compliance through a certification process in a manner similar to that proposed for government entities.
- 2) If, nevertheless, private organizations are required to implement some method of providing financial assurance for the decommissioning of research reactors, appropriate levels of such assurance should be specified in the rule (perhaps based on authorized power level), so that the organization will have the option of providing assurance in that amount or in some other amount based on a decommissioning funding plan, i.e. the same option afforded most other licensees.

D.3.2.4

D.2.2

Thank you for the opportunity to comment on the proposed rule. If we may be of further assistance in developing a useful and effective rule, we shall be pleased to cooperate with the Commission in this regard.

Sincerely your,

*Lincoln Clark, Jr.*  
Lincoln Clark, Jr.  
Associate Director  
Nuclear Reactor Laboratory

*Otto K. Harling*  
Otto K. Harling  
Director  
Nuclear Reactor Laboratory

PROJECT NUMBER  
PROPOSED RULE PR-30, 40, 50 et al  
(50 FR 5600) (35)

THE PENNSYLVANIA STATE UNIVERSITY

UNIVERSITY PARK, PENNSYLVANIA 16802

College of Engineering  
Breazale Nuclear Reactor

DOCKETED  
USNRC

Area Code 814  
865-6351

85 MAY 13 P2:39

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

7 May 1985

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Docketing and Service Branch

Dear Sir:

I wish to submit my comments on the proposed amendments to 10 CFR Part 30, 40, 50, 51, 70 and 72 Decommissioning Criteria for Nuclear Facilities, Federal Register, Vol. 50, No. 28, pages 5600-5625. First, Dr. A. Francis DiMeglio, as Chairman of TRTR, has submitted to you comments in his May 9, 1985 letter with which I totally agree. In addition, I would like to make my own comment.

The NRC continually places great stress on the non-power reactor community by not considering non-power reactor facilities significantly different from power reactors. In the late 1950s and 1960s, a research reactor was considered to be a prestigious facility to have on campus. The deans supported these facilities so that they were operated under conditions of high moral and productivity. In the '70s and '80s, the deans and presidents who were responsible for establishing the research reactor facilities were replaced with new personnel. Today, the new deans are no longer interested in research reactors, but now have their attention turned to other activities (for example, computer sciences, electrical engineering, etc.) which are now the prestigious facilities on campus. In fact, the university research reactors are becoming the pariah facilities. The deans now look upon research reactors as an unwelcome facility requiring more funds from their budget than they are willing to spend. As a consequence, the existence of non-power or research reactors at universities hangs on a thin thread. Each time the NRC, without thinking, proposes rules for power reactors and then relates these to non-power reactors, a few threads are cut. I, therefore, feel that when rules and

G.3.1

MAY 15 1985

Acknowledged by card.....

pd

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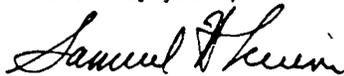
J-163

regulations are made for non-research reactors, they should be considered separately from power reactors.

G.3.1

Thank you for your consideration.

Sincerely yours,



Samuel H. Levine  
Professor, Nuclear Engineering  
Director, Penn State Breazeale Reactor

SHL:mb

cc: I. McMaster  
W. Witzig  
A. Francis DiMeglio

OFFICERS

Judith M. Barrows  
President  
N... aprea Hall  
resident  
L Taylor Mudge  
Treasurer

# SAFE POWER FOR MAINE

P.O. Box 2204  
Augusta, Maine 04330  
(207) 623-9231

DOCKETED  
USNRC

May 8, 1985

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Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

85 MAY 13 P2:39

ATTN: Docketing and Services Branch

OFFICE OF SECRETARY JACKET NUMBER  
DOCKETING & SERVICE  
BRANCH

PROPOSED RULE PR-30450 et al  
(50 FR 5600) (36)

RE: Decommissioning Criteria for Nuclear Facilities  
#50 Fed. Reg. 5600, February 11, 1985

Dear Sirs:

We are pleased to see that you are promulgating rules to insure that money will be available for the safe decommissioning of nuclear reactors.

D.8.1  
G.1

We hereby recommend two changes to make the rules more effective and provide a better safeguard for both the ratepayers and the stockholders.

First, we suspect that the \$100 million used as an estimated cost of decommissioning is inadequate. The cost of decommissioning Shippingport, which is less than 1/10 the size of our Maine Yankee, is estimated to be nearly that much, so the cost of decommissioning a full-size power reactor would surely be more. There are still many uncertainties in the cost of disposing of the nuclear waste generated by the decommissioning process which may have a significant impact on the overall cost. We therefore believe the utilities should be required to update their estimated costs on a regular basis (perhaps every 3 to 5 years) to make sure they reflect the current market values.

D.1.1.1

D.4.3

Second, we believe the funds for decommissioning should be kept in a separate segregated account which can not be used for other expenses of the utilities or for investment in other utilities or related industries. We would prefer some form of prepayment, whereby the money for decommissioning is collected and set aside before the plant begins to operate or during the first five years of operation. Where that is not possible, we believe the money should be collected as rapidly as possible, so that a majority (if not all) is collected during the plant's first 10 years of operating life, when there are less outages for repairs and retrofits than when the plant is older.

D.3.2.1.1(a)

D.3.2.2.1

Thank you for your consideration of these points.

Sincerely,

Judith M. Barrows  
President

MAY 15 1985

Acknowledged by card.....  
*DL*





# Educational Campaign for a Prosperous Georgia

175 Trinity Ave. S.W., Atlanta, Georgia 30303 404-659-5675

JACKET NUMBER

PROPOSED RULE

PR-30,40,50 et al

May 10, 1985

(50 FR 5600)

DOCKETED  
USNRC

37

To: Secretary of the Commission  
Attention: Docketing and Service Branch  
United States Nuclear Regulatory Commission  
Washington, D.C. 20555

85 MAY 13 P2:38

Re: Proposed Rule on Decommissioning Criteria for Nuclear Facilities  
NOTICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

These comments respond to the above-reference proposal as described in the Federal Register, 2-11-85, Vol. 50, No. 28, pp. 5600-5625.

It is imperative that the Commission establish rules to assure that reactors are decommissioned and reactor sites returned to a safe status. Unfortunately, the proposed rule does not meet this minimum requirement. There are many shortcomings in the proposal; these comments will address a few of them.

It is incomprehensible that nuclear power plants have been constructed, licensed and operated in this nation without clear and effect plans for disposing of the radioactive remains at the end of the licensed operation. It is like sending astronauts into space and then trying to figure out how to bring them back. While we are glad that this issue is finally being addressed, we object strenuously to the failure to address it before now, as well as to the inadequacies of the proposed rule.

G.1

In the late 1970s, prior to the Three Mile Island accident, the author of these comments (then employed by the State of Georgia) served on an advisory committee to the NRC; our task was to make recommendations as to funding decommissioning (who will pay, how will it be collected, etc.). Everyone on the committee agreed that it is only fair that those using the electricity be charged all the costs of that use, including the costs of decommissioning; failure to do so not only might lead to inadequate funding when the time came, but it would also distort the marketplace by hiding certain of the costs of nuclear generated electricity. Here in Georgia, the Georgia Power Company collects decommissioning charges from ratepayers through its depreciation schedule for its nuclear plants.

D.3.2.1.1(a)

A difficult at the time, and today, with passing decommissioning costs on to consumers is that no one really knows what it will cost to decommission a nuclear power plant. The funds provided for under the proposed rule are woefully inadequate to current estimates (which are themselves questionable). One hundred million dollars is half of what Georgia Power currently estimates the cost will be to decommission each unit of its Plant Vogtle. Even Georgia Power's estimate is likely low. Consider what is involved in decommissioning a large commercial nuclear reactor: not only must it be taken apart piece by piece, much of this must

D.1.1.1

ACKNOWLEDGED BY CARD... MAY 15 1985

be done with robots by remote control (since the areas are so radioactive). Many different workers will have to be spent in those radioactive areas where humans are used, since they will receive their maximum permissible exposure in a relatively short time. Then, all the waste products must be shipped to a disposal facility, there to be disposed of in a way that will not endanger the health or safety of the public. All of these measures and more will cost tremendous sums of money, perhaps on the order of the cost of the plants themselves (in real dollars).

D.1.1.1

Obviously, it is necessary that the utilities collect the accurate amount of money for decommissioning while the plant is operating. Collecting too little now will mean inadequate funding for decommissioning.

D.8.1

Another problem which was discussed with the NRC advisory committee on which I served was the simple question: what happens to the money in the meantime? What protection do consumers have to insure that the money will be there to decommission the reactor when the time comes? Who will be able to use the money, and for what purpose, in the meantime? What will happen if the utility goes bankrupt?

Although few analysts thought utility bankruptcy a real possibility at the time, it has since been recognized as such. Not only have several electric utilities approached bankruptcy through simple mismanagement (Georgia Power Company, Public Service Company of New Hampshire, Long Island Lighting Company and others), but new developments in technology (some of which are already appearing) could destroy the electric utilities' monopoly position and end the industry's financial stability. For example, developments bringing down the costs of photovoltaic cells, fuel cells or other decentralized production of power could lead to consumers getting "off the system" or producing their own electricity. Vigorous enforcement of the Public Utility Regulatory Policies Act, followed by evolution of some of its measures, could lead to greater competition in the generation of power, offering customers a choice of the cheapest generator.

D.3.2.1.1(a)

Electric utilities' responses to increased competition through rival fuel sources and conservation has been typically monopolistic--raise prices to replace lost revenues and pay fixed costs. Such a response characterized the railroads' response to the heavily subsidized trucking industry, consequently driving away more customers, causing the railroads to respond with higher rates in a vicious cycle which led the former "invincible monopolies" to insolvency. Western Union responded similarly to telephone competition. It is not difficult to foresee electric utilities going bankrupt.

Thus, it is crucial that the utilities be required to maintain their decommissioning funds in escrow accounts held separately and protected from other corporate funds or debts. One way might be to have the government or another independent entity hold the money. It could be invested in government bonds for safety but

it should not be spent by the corporation for construction or other activities (as is now the case). For example, Georgia Power has no decommissioning fund even though they are collecting millions of dollars from consumers for "decommissioning." Since the utility already came within days of bankruptcy in 1974, since its current management seems bent on leading down a similar path today, and since conditions beyond management's control might cause it to go bankrupt in any case, it is unacceptable that this money remain under corporate responsibility.

Another shortcoming of the rule is that it fails to meet the criteria required under the National Environmental Policies Act.

In summary, we support the implementation of rules to require decommissioning methodology (including funding) for all proposed or operating nuclear facilities. No nuclear plant should be allowed to operate without such assurance, including specific decommissioning plans and funding therefor. The funding should be raised in advance, preferably before the reactor operates, since a major accident could lead to problems decommissioning it if the money isn't there, particularly in view of the fact that such an accident, causing loss of a billion-dollar or more facility, could itself bankrupt an otherwise healthy utility. And the funding should be kept separate from the utility and protected from creditors in event of bankruptcy.

Thank you for your consideration of these comments.

Sincerely,



Tim Johnson  
Executive Director

D.3.2.1.1(a)

F.1

G.1  
D.8.1

D.3.2.2.1

COMMISSIONERS  
Eric J. Schneidewind  
Edwyna G. Anderson  
Matthew E. McLogan

STATE OF MICHIGAN



JAMES J. BLANCHARD Governor

DEPARTMENT OF COMMERCE

XXXXXXXXXXXXXXXXXXXX  
RALPH J. BEASON, Director  
Doug Ross, Director

DOCKET NUMBER  
PROPOSED RULE PR-3049 sub 1  
(50 FR 5600)

38

PUBLIC SERVICE COMMISSION  
6545 Mercantile Way  
P O Box 30221  
Lansing, Michigan 48909

DOCKETED  
USNRC

May 10, 1985

85 MAY 13 P2:16

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Docketing and Service Branch

RE: Nuclear Regulatory Commission  
10 CFR Parts 30, 40, 50, 51, 70 and 72  
NRC Docket No. PRM-50-22  
Proposed Rule on Decommissioning Criteria for Nuclear Facilities

Gentlemen:

Enclosed are comments on the above matter on behalf of the Staff of the Michigan Public Service Commission. If there are additional opportunities for interested parties to participate or if you have questions concerning these comments, please let us know.

Sincerely,

Hasso C. Bhatia, PhD  
Director, Technical Services Division

Enclosure

MAY 15 1985

Acknowledged by card

J-169

Nuclear Regulatory Commission  
10 CFR Parts 30, 40, 50, 51, 70 and 72  
NRC Docket No. PRM-50-22

Comments on Proposed Rule  
DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES  
by  
Staff of the Michigan Public Service Commission

The Staff of the Michigan Public Service Commission submits the following comments on the proposed rule establishing criteria for decommissioning nuclear facilities. The comments are in response to the Nuclear Regulatory Commission's (NRC) concerns stated in the Federal Register on February 11, 1985.

- I. What decommissioning funding methods should be allowed during the period a plant is in operation?

Comments

- a. We support the NRC position that rulemaking "allow latitude" and consider a range of options for decommissioning mechanism.

D.3.1

We also share the NRC concerns that there be an adequate provision to assure adequate funds for a safe and timely decommissioning of the nuclear facility upon termination of the operations.

D.8.1  
G.1

We also appreciate the fact that the NRC recognizes the rate setting responsibility of the state regulatory commissions.

- b. It is the position of the Michigan Public Service Commission Staff that the specific funding mechanism be the sole province of the state regulatory commission. The funding method whether prescribed by NRC or selected by the utility shall ultimately be recovered from the ratepayers through a ratemaking proceeding. The state regulatory

D.8.3.1

agencies are in the best position to determine the most effective and economic method for funding decommissioning expenditures as it involves tax, accounting and financial considerations. Moreover, the circumstances can vary from utility to utility, thus requiring different funding mechanisms. As you are aware, the federal income tax laws have been evolving in recent years, altering the relative financial advantages of various funding methods. For example the 1984 tax law (Sec. 468A) now allows tax deduction for payments made into the external "Decommissioning Trust Fund". Another bill now in the Congress (Rep. Sam Gibbons) would further liberalize the tax treatment of decommissioning funds even when established internally. In order for the utilities and the rate regulatory agencies to arrive at the least-cost option and to take full advantage of the tax laws, it is best that the state agencies exercise jurisdiction over the prescription of the decommissioning funding methods.

Michigan, just as many other states, is aware of the need for establishing an appropriate funding program to ensure that decommissioning will be carried out in a safe and responsible manner at the termination of the operating life of the nuclear units. In Michigan we have already instituted hearings, widely participated in by the interested parties. Based on the record and the facts presented, the commission will make a determination of the appropriate funding method.

It is therefore the recommendation of the Michigan Public Service Commission Staff that the Nuclear Regulatory Commission not prescribe any specific funding criteria.

D.8.3.1

D.5

D.8.3.1

c. The NRC proposal that any internal funding option must be supplemented by an additional guarantee or surety would negate the cost effectiveness of this option. Adequacy of the internal funding must be determined by the state commissions as part of their overall criteria to secure sufficient funds. If a state commission felt that internal funding would leave the utility vulnerable from meeting its obligations, it would reject that option for the utility. However, additional surety (which imposes additional costs on the ratepayers) should not be required if in the judgement of the state commissions the internal funding can reasonably assure the availability of the funds.

D.3.3.3

D.8.3.1

d. The Michigan Public Service Commission Staff supports the transfer of the decommissioning responsibility to the federal agency as this will provide maximum assurance for a successful decommissioning of the facility. Funds for this service may be collected during the operating life of the plant based on \$/kw/yr. This method is similar to the current nuclear fuel disposal provision.

D.8.3.2

G.14

e. The NRC has proposed that the utilities with deficient funding for decommissioning must make up the deficiency over the next five years or one-third the remaining life, whichever is longer.

D.4.6.1

The MPSC Staff suggests that the state commissions should determine the appropriate period for this "make whole" provision, up to the remaining life of the plant. This will enable the commissions to prevent a "rate shock".

f. When a nuclear facility is jointly owned by more than one utility,

D.4.5

only the majority utility (which in most cases is also the operating utility) should be responsible for developing the decommissioning plans.

D.4.5

II. Which funding methods should be allowed during any long-term or delayed decommissioning?

Comments

If there is an internal reserve for all or part of the decommissioning fund when plant operations cease it should begin to be converted to cash if decommissioning is to start or to an external fund if decommissioning is to be delayed. To the extent that the conversion to cash exceeds the ongoing need for cash, the excess cash should be placed in an external fund.

D.3.4

III. Should a prescribed dollar amount for the decommissioning fund be determined by the NRC?

Comments

The Michigan Commission Staff suggests that each licensee make a study of the technical aspects of decommissioning mode and the cost for its plant. This will permit recognition and consideration of any unique construction, location or operating circumstances. It will result in more research on cost-effective decommissioning methods than if the alternative of a prescribed dollar amount is permitted. Updated studies of the technical aspects of decommissioning and the cost should be filed periodically, every five years for example, with the NRC for review. If the NRC

D.2.1(a)

or interested parties have concerns as to the adequacy of the licensee's plans, hearings could be held to resolve the issues.

The MPSC Staff recommends that no specific dollar amount should be prescribed.

D2.1(a)

- IV. Why the need to consider insolvency and its impact on the continued availability of funds?

Comments

MPSC Staff believes that this is a legitimate concern which goes to the heart of the issue. The state commissions however are in the best situation to judge the solvency of a utility and to evaluate warning signals of a potential problem.

Periodic review of funding methods and verification of records will allow opportunity for any corrective action. It should be recognized however that if a utility can afford to build and operate a nuclear plant it can also afford to tear it down.

D.3.2.1.1(b)

We thank you for the opportunity to comment on this issue.

Date: May 10, 1985

May 10, 1985

USNRC

Secretary of the Commission  
U.S. Nuclear Reg. Commission  
Washington, D.C. 20555  
Attn: Docketing & Service Branch

'85 MAY 13 P2:41

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Secretary -

These comments are in regard to  
"Decommissioning Criteria for Nuclear  
Facilities":

1) The NRC should specifically choose  
& regulate decommissioning methods. This  
should not be left to the discretion of  
the utility.

B.3.3

2) Needs to develop standards to  
minimize worker exposure during  
decommissioning. A register of workers  
should be required during decommissioning.  
Basic essential safety practices should  
be required + methods for meeting safety  
criteria.

C.1.8.1

C.1.10

C.1.3

3) I support the prepayment funding  
approach & also a re-evaluation of estimates  
every five years + re-adjustment of funding  
amounts required.

D.3.2.2.1

D.4.3

Sincerely,  
Lou M. Barber  
LOUIS M. BARBER  
728 OCEAN  
SHELL BEACH, CA 93449

MAY 15 1985  
Acknowledged by card



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

PROPOSED RULES - 30, 40, 50 et al:  
(50 FR 5600) (40)

MAY 13

RECEIVED  
MAY 13 1985

OFFICE OF  
EXTERNAL AFFAIRS

85 MAY 13 P2:42

Mr. Samuel Chilk  
Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

ATTENTION: Docketing and Service Branch

Dear Mr. Chilk:

In accordance with Section 309 of the Clean Air Act the U.S. Environmental Protection Agency has reviewed the proposed Decommissioning Criteria for Nuclear Facilities (10 CFR 30, 40, 50, 51, 70 and 72; 50 F.R. 5600 et seq.)

The NRC's proposed rule sets forth decommissioning criteria for nuclear facilities licensed under 10 CFR Parts 30, 40, 50, 51, 70 and 72. The proposed amendments to these Parts address decommissioning planning needs, timing, funding mechanisms, and environmental review requirements. We note that the NRC has not proposed "acceptable levels" of residual radioactivity for release of property for unrestricted use. Rather, the proposal refers to a separate rulemaking action that will amend 10 CFR Part 20 to provide those limits. The Environmental Protection Agency (EPA) is also developing residual radioactivity criteria for decommissioning facilities and sites where radioactive materials have been used. We will continue to maintain close communication with the NRC on this subject.

The EPA has no objection to the substance of these proposed technical and financial decommissioning requirements. However, because some of the requirements in the proposal are not explicit, we believe they could be subjected to undesirable interpretations. Our comments identify the portions of the proposal which should be clarified.

A. Definition of Permanent Cessation of Operations and Criteria for the Decommissioning Duration

There are three areas in the proposed rule where these definitions should be provided or made more specific. First, licenses may continue

G.1

C.1.2.1

MAY 13 1985

pd

to be renewed as operating licenses as long as facilities may potentially operate. This condition enables a licensee to defer decommissioning by continuing to renew the facility's operating license. Although the expense of maintaining a license would discourage such misuse of renewal, NRC should specify criteria for permanent cessation of operations that would eliminate the possibility of such misuse to avoid decommissioning.

C.1.2.1

Second, there is no time limit on the duration of decommissioning operations. Although the licensee must maintain the site in a safe manner during decommissioning, it may be a lengthy process during which radioactive emissions may occur. We recognize that different facilities may require different time periods to decommission. However, all licensees should plan that the duration of decommissioning does not adversely affect compliance with the "as low as reasonable achievable" (ALARA) requirement. To aid licensees in their decommissioning planning, and to ensure consistency among decommissioning plans and analyses, we recommend that the NRC provide guidance for determining appropriate time periods for decommissioning.

B.4.3

Finally, NRC stated (50 F.R. 5605, col. 2), without explanation, that it is not specifying a time period during which licensees of reactors that have already shut down must submit decommissioning plans. We understand that many such licensees have already begun decommissioning or have already prepared plans. We recommend that NRC require such licensees to review their plans within a certain time period after rules become final and submit revisions if those plans are inconsistent with these new NRC regulations.

C.9

#### B. Level of Detail in Licensee Termination Survey Requirements

The only proposed survey requirements are for the units in which the survey measurements should be reported. Although the NRC plans to provide regulatory guidance documents for license termination surveys, these guides may not be soon forthcoming. We recommend that NRC increase the level of detail in this rule, even on an interim basis, to provide licensees with necessary guidance as to what constitutes reliable and consistent termination surveys.

E.1.2

#### C. Waiver of Requirement for License Termination Survey

NRC proposes to waive byproduct, source, and special nuclear material license termination survey requirements if the licensee demonstrates in some other manner that the premises are suitable for unrestricted use. We understand that NRC intends to waive survey requirements only for those licensees using sealed sources or short-lived radioactive materials, which would be reasonable. We recommend that NRC state such limitations on survey waivers in the documentation of its final rules.

D. Preparation of Environmental Documents

Proposed Section 51.95 states that either an environmental assessment or supplemental environmental impact statement will be prepared for the post operating license stage. EPA recommends that the Commission require preparation of supplemental environmental impact statements for the post operating license stage of major facilities, such as nuclear power plants, nuclear waste disposal facilities, and nuclear fuel fabrication facilities. EPA believes it would be beneficial for the Commission to have public review of the options for disposal of decommissioning wastes and other site-specific aspects of the post operating license state. For smaller facilities EPA agrees with the Commission proposal that preparation of an environmental assessment is appropriate and acceptable. EPA also agrees with NRC addressing the decommissioning of nuclear waste disposal facilities in other rulemaking actions.

F.1

G.7

If you have any questions concerning EPA's comments, please call Dr. W. Alexander Williams (382-5909) of my staff.

Sincerely,



Allan Hirsch  
Director  
Office of Federal Activities

PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (41)

5476 Harpers Farm Rd. B3  
Columbia, MD 21044  
May 10, 1985

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

DOCKETING  
SERVICE

Attn: Docketing and Services Branch 85 MAY 13 P2:53

Dear Sirs:

OFFICE OF SECRETARY  
DOCKETING & SERVICE

I understand that the NRC is preparing ~~rules~~ for decommissioning nuclear reactors. I am very much concerned that these rules and their compliance should adequately protect the health and safety of the workers and the public, and that fair and adequate funding be planned to guarantee the safe completion of this decommissioning. I would like to submit the following comments for your consideration as you finalize your rules.

G.1

Safety

New health data show adverse health effects of much lower exposures than has been previously acknowledged. Since reports (from TMI 2 cleanup and the Shippingport decommissioning experience) indicate that total occupational radiation exposure during decommissioning may be substantially higher than previously estimated by NRC studies, and since most workers are likely to be at the prime of their child-bearing age, I am very concerned that :

C.1.8.1

1. Stringent safety standards be required which would minimize worker exposure, and which would be spelled out in great detail.
2. Strict enforcement and monitoring or oversight of these standards be required.
3. Techniques for worker protection and for reducing worker contact with radiation (perhaps greater use of robots or remote mechanical devices) be developed.
4. Careful, complete and thorough records be required of each worker's radiation exposure, and that these records must accompany employees from job to job.
5. Stringent safety standards for transportation of radioactive materials be required and enforced. (These standards and assurances that they are enforced should be specified in detail to ensure compliance).
6. Differentiation between "high", "intermediate", and "low" level wastes must be clearly defined and compliance firmly enforced.

C.8

C.1.10

C.1.13

H.1.1.1

Method of Decommissioning

I urge you to not allow permanent encasement of reactors (and spent fuel pools) at any location---either test reactors or commercial reactors. Most test reactors are in highly populous areas; many commercial reactors are, too.

B.5

Acknowledged by card MAY 15 1985 pd.

The NRC should develop strict guidelines and criteria which help utilities determine whether to dismantle plants immediately or to delay a pre-determined time.

B.3.1.1

Does the process of decommissioning deal with pools of spent fuel rods which are now in temporary storage at reactor sites?

B.1.2.2

Funding

I am concerned that if the nuclear industry is forced to close down all at once, or even phased out over a period of time, that there will be a colossal financial burden on the utilities (that are already close to the brink of bankruptcy). Is it possible to ask Congress to provide a federal bailout similar to the Chrysler deal which may make it possible for utilities to extricate themselves from the financial sink hole which is causing the poorly managed utilities great fiscal distress? This same low-interest, long term loan may help utilities stay solvent long enough to complete the decommissioning process. Perhaps a qualifying clause for eligibility could be to improve accountability and improve management efficiency? As a taxpayer it would irk me to further subsidize irresponsible mismanagement.

D.3.2.1.2

I think it is important to be honest and up front with the public about the real cost of decommissioning nuclear reactors. (And to be honest about the real cost of producing nuclear power, not hiding all those federal subsidies.) Is the cost of decommissioning factored into the "cost" of nuclear power? How much of the financial burden of decommissioning will fall on the taxpayer/ratepayer/intentional investor?

D.3.2.1.1(a)

D.8.2.2

Conclusion

Strong regulations in the rule books are very important. I am even more concerned that the public can have confidence in enforcement of these rules. The public has learned not to trust the enforcement agencies. Reports I have read regarding sloppy construction practices at reactor sites and slip shod operating and management procedures at some reactor sites makes me very apprehensive that enforcement of decommissioning regulations will be any better. The public had no choice about whether or not to accept nuclear power. Please help ensure that we can manage this dangerous technology with minimal health and safety damage.

D.8.1

G.1

C.1.3

D.8.1

Sincerely,

*Patricia T. Birnie*

Patricia T. Birnie

-30, 40, 50 et al  
(50 FR 5600) (42)

P.O. Box 140  
Macon, Missouri 63552  
MAY 10, 1985  
85 MAY 13 P3:24

OFFICE OF PUBLIC AFFAIRS  
ATTENTION: ~~Public Affairs~~ <sup>Public Affairs</sup> and Service Branch  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Sir:

I am extremely concerned that provisions be made for adequate financial and environmental safe decommissioning of nuclear reactors. It is past time that the Nuclear Regulatory Commission develop regulations to protect our land and our citizens from radiation contamination and exorbitant charges relating to nuclear reactor construction and decommissioning costs.

D.8.1  
G.1

First we should turn to environmentally safe sources of renewable energy. Secondly there must be a safe permanent disposal site for high-level radio-active waste; Thirdly there must be an "immediate dismantlement" method of decommissioning radioactive reactors. There should be a very thorough study of site selections and of methods transport radio-active wastes to these sites.

H.2  
H.1.1.4  
B.4.2  
H.1.1.1

Policy recommendations for federal action for decommissionings listed by Public Citizen and Environmental Action seem adequate to insure that decommissioning will be carried out in a safe manner.

In addition to these recommendations these state actions seem imperative: Make utility stockholders responsible for decommissioning costs not collected from ratepayers during the operating life of the plant and require prepayment of external segregated funds in the event the NRC fails to make this national policy.

D.8.2.2  
D.3.2.2.1

pd

There should be a rule whereby the NRC must prepare an environmental impact statement for nuclear reactors. A nuclear utility must collect decommissioning funds that will be available when needed and a means of adjusting cost estimates and funding levels over the plant's life; these funds must not be used to purchase assets or reduce existing debt. These "phantom funds" must be unsegregated as they can be used for financing other power plant construction equally or more expensive and unsafe. Federal radiation standards should be set at an upper limit--10 millirems in order to protect the citizenry.

F.1

D.4.3

D.3.2.1.1(a)

E.1.1

Very sincerely,

*Aileen Gauntt*  
Aileen Gauntt

FMC Wyoming Corporation

DECISION NO. PR-30,40,50 et al  
PROPOSED RULE (50 FR 5600) (43)

May 8, 1985

U.S. NRC

**FMC**

'85 MAY 13 P3:21

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
DUCKETING & SERVICE BRANCH Re: Decommissioning Criteria for Nuclear Facilities

Attention: Docketing and Service Branch

Gentlemen:

After reviewing the Nuclear Regulatory Commissions Proposed rule for 10 CFR Parts 30,40,50,51,70 and 72 entitled "Decommissioning Criteria for Nuclear Facilities" found in the FR Vol 50 No. 28 pages 5600 through 5625 for Monday, February 11, 1985 we respectfully submit the following:

The proposed rule does not clearly define what licensed facilities are covered by this rule. Our facility holds NRC licenses for the use of sealed source nuclear gauges. Under the proposed rule section entitled Background, paragraph number 3 the proposal states that:

"For the purpose of this proposed rule, the term 'nuclear facility' is used to refer to the site, buildings and contents, and equipment associated with any NRC licensed activity."

G.9

Paragraph 5 in the same section states:

"These proposed amendments apply to decommissioning of power reactors, nonpower reactors, fuel reprocessing plants, fuel fabrication plants, uranium hexafluoride production plants, independent spent fuel storage installations, and NON-FUEL-CYCLE NUCLEAR FACILITIES." emphasis added.

Acknowledged by [Signature]

2

Secretary of the Commission

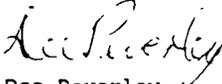
May 8, 1985

The use of the term 'nuclear facilities' in paragraph 5 coupled with its definition in paragraph 3 suggests this rule applies to any NRC license. It is our understanding through conversations with the NRC Region IV office in Arlington, Texas that this is not the intent of the proposed rule. If this is the case, we suggest that the wording be changed to remove this ambiguity.

G.9

Thank you for the opportunity to comment on these proposed rules.

Sincerely,



Dee Peverley  
Environmental Manager

rp



1115 WOODLAWN DRIVE • CAMDEN S C 29020 • (803) 432-3872

DOCKET NUMBER PR-30,40,50 et al.  
PROPOSED RULE (50 FR 5600) (44)

May 8, 1985

DOCKETED  
USNRC

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

'85 MAY 13 P3:22

Attn: Docketing and Services Branch

OFFICE OF SECRETARY  
DOCKETING & SERVICES  
BRANCH

Ref: No. 50 Fed Reg. 5600, February 11, 1985

COMMENTS OF FRED M. OGBURN, III,  
REPRESENTING THE KERSHAW COUNTY  
SAFE ENERGY PROJECT REGARDING  
"DECOMMISSIONING CRITERIA FOR  
NUCLEAR FACILITIES"

On my own behalf and on behalf of the Kershaw County Safe Energy Project,  
an unincorporated citizen's action group, the following suggestions for strengthen-  
ing the rule referenced above are hereby submitted.

1) Regarding decommissioning methods, we believe that the ENTOMB method  
should be forbidden due to the long life of certain radioactive elements within  
the reactor. We further believe that DECON would subject workers to dangerous  
radiation levels. We believe that SAFSTOR is probably the least objectionable  
decommissioning method. However, the matter of financial accountability in the  
event of a utility bankruptcy prior to completion of SAFSTOR must be addressed.  
Furthermore, the rule should provide more guidance as to which method a utility  
should choose.

B.5  
B.4.2  
D.3.4  
B.3.1.1

2) In regard to decommissioning standards, the Commission needs to develop  
standards to minimize worker exposure to radiation during decommissioning.  
Quality control standards need to be spelled out and the Commission should require  
licensees to demonstrate their ability to comply. Furthermore, intermediate level  
waste should not remain classified as low-level, and should not be disposed of at  
low-level waste dumps.

C.1.8.1  
C.6  
H.1.1.1

Acknowledged by Cary... MAY 15 1985

3) Regarding decommissioning funding, we believe that the prepayment option is the only one of the methods proposed in the rule which will ensure adequate funding for decommissioning in the event of premature shutdown of a nuclear power plant. Furthermore, the internal fund, unsegregated from the utility's other assets, would offer no protection to the public in the event of a bankruptcy. This option should be removed from the rule altogether.

D.3.2.2.1

D.3.2.1.1(a)

4) We believe the Commission probably underprojected the actual costs of decommissioning. What little track record exists in the matter of decommissioning nuclear power plants (e.g., Shippingport) suggests that the cost of decommissioning large commercially owned nuclear plants would be much higher than previously anticipated. For example, we can only speculate what the costs of storing high level waste will be in the future. We do know these costs have increased over 700% in the past 7 years.

D.1.1.1

The Commission should reevaluate its decommissioning cost estimates and should require utilities to adjust their decommissioning funds periodically in order to ensure sufficient funds.

D.4.3



FRED M. OGBURN, III  
1115 Woodlawn Dr.  
Camden, SC 29020

MARTHA DRAKE  
230 FAIRVIEW  
PETOSKEY, MICH. 49770  
(616) 247-4648 OR 2886

30, 40, 50 etc /  
(50 FR 5600) 45

May 7, 1985

Secretary of the Commission  
U.S. Nuclear Regulatory Commission '85 MAY 13 P3:23  
Washington, D.C. 20555

Attention: Docketing and Search Branch  
DOCKETING AND SEARCH BRANCH

Gentlemen:

I am writing to comment on the Decommissioning Criteria for Nuclear Facilities, NRC 10 CFR Parts 30, 40, 50, 51, 70 and 72.

I believe they should be scrapped and started over for the following reasons.

G.1

In the first place they are confusing. For instance, Sec. 50.51 says that unless application for renewal of a license is made a licensee must apply to terminate the license no later than one year prior to the license's expiration date.

C.1.1

Wouldn't it be better to have a separate department charged just with decommissioning so that there isn't confusion with the regular licensing procedure?

C.1.3.1

Then the costs for decommissioning are based on old figures and only allow for inflation not the increased costs for decommissioning or the increased costs for plants that are older and more radioactive.

D.1.1.1

The money must be set aside by the utility in such a way that they can't use it for other things. In our case, Big Rock is somewhere's near ready for decommissioning and yet the company that owns it, Consumer Powers, is on the verge of bankruptcy. Who is going to pay for decommissioning this plant? Will it be done properly when the company has no money?

D.3.2.1.1(a)

Dr. Radford and others have proposed more stringent radiation standards which will probably be adopted as we are seeing some health effects among workers at these plants from these levels of exposure. That will mean more cost.

D.1.1.1

I believe there needs to be a whole fresh approach to this regulation.

G.1

Thank you,  
*Martha Drake*  
Martha Drake

SEARCHED INDEXED

pd

PROPOSED RULE 11-30, 40, 50 et al  
(50 FR 5600)

46

DEAN WITTER REYNOLDS INC.  
2 World Trade Center, New York, NY 10048 Telephone (212) 524-2222

May 6, 1985

DOCKETING  
BRANCH

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

'85 MAY 13 P3:24

Att: Docketing and Service Branch  
(Decommissioning Criteria for Nuclear Facilities)

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Sir:

This letter is written in response to the request for comments on the proposed rule regarding the decommissioning criteria for nuclear facilities. The area of particular emphasis to be given in this letter will be with regard to the funding mechanisms for the decommissioning for power plants owned by investor-owned public utilities.

The Commission has appropriately addressed the need for the utility to be able to give financial assurance as to the ability to carry out decommissioning which may take place many years in the future and the cost of which is at present speculative. The proposed rule specifies several acceptable funding methods:

D.8.1  
G.1

1. Prepayment
2. External sinking funds
3. Internal reserve
4. Insurance, surety bonds, letters of credit, lines of credits and other guarantee methods.

Of these four methods, the first two, prepayment and external sinking fund, are very similar as they would be applied to an investor owned public utility and will be considered together in the remainder of this letter. This classification of funding method has several features which make it superior to the third and fourth methods. First, the external method requires a specific accounting for and setting aside of funds for the single purpose of decommissioning. This is also very important to two major parties at interest in this subject in addition to the Commission and the utility. These parties are the Public Utilities Commission (regulator) with jurisdiction over the utility operation and the Internal Revenue Service (IRS) which administers the taxability of the considerable flow of revenues and income which will eventually need to be set aside to assure that decommissioning is financially feasible under all circumstances.

The regulator's duty is to provide a flow of funds from the utility's customer who is using the service from the power plant during its useful life. It is very important for the Commission to recognize that regulatory practice strongly supports the concept that

D.3.2.2.4

Acknowledged by 2221 *hilar* 200 *pd*

only those customers who use the service from the power plant should pay its costs (including decommissioning) and that in most cases such payment should come from those customers only during the useful life of the power plant. The external fund method in segregating the funds assures the regulator that this duty can be discharged.

D.3.2.2.4

Similarly, the IRS has been charged through the 1984 Tax Act to allow such funds for nuclear decommissioning to be a current tax deduction for the utility company only to the extent that such funds are currently collected in rates from its customers and separately set aside in a segregated fund such as a trust. This provides that the customer using the service only has to provide funds necessary for the actual decommissioning and not for taxes to be currently paid on any such revenues as though they provided income for the utility. Again only the external method will provide for this economy.

D.5

In contrast, the third method, internal reserve, does not meet the new IRS test or does it give the regulator a complete record of the status of the funds to be set aside. This is the method which utilities have used to account for money collected for deferred taxes. However, since nuclear plant assets may be such large portions of a company's assets, it may not be practical to issue bonds against such assets to completely pay for decommissioning. Since from the Commission's perspective, assurance is the most important criterion, the internal funding method seems much less desirable than the external method.

D.3.2.1.1(a)

The external method also is the traditional method of providing for pension fund obligations. As such, pension funding provides a role model for nuclear decommissioning funding. In pension funding for utilities, money is collected through utility rates, is tax deductible, and is invested in external trust accounts. This thought carried further would include a possible solution to the issue the Commission raises when it asks how to pay for premature decommissioning for reasons other than an accident. With pensions, there are forms of government insurance to cover shortfalls in account balances. With nuclear decommissioning, there could also be such insurance or there could be utility industry provided insurance against premature nuclear decommissioning. This technique in combination with the use of external trust accounts should assure availability of funds as with pension obligations.

D.3.2.2.3

Another issue which the Commission addressed is the problem of funding for an existing licensee. The Commission suggests that it would be appropriate for a licensee to make up over a five year period for previously not funding decommissioning costs. However, the IRS apparently will only allow tax deductible contributions to a fund on a level basis pro rated for the normal remaining life of a unit. Thus, some portion of the accelerated catch up funding would be judged as income to the utility and require extra revenue to pay taxes on such funding.

D.4.6.1

Subjects with which the Commission did not deal were the following:

1) A nuclear unit with more than one owner. Should the presumption be that each owner of each unit be responsible for its own decommissioning fund for that portion of the unit which it owns? The 1984 Tax Act and regulatory custom indicate that would be appropriate. A related question is how to deal with a company if its regulator does not allow it to recover funds in its rates to set up a nuclear decommissioning fund. Some states have yet to address this subject while others treat it in a variety of different ways. Uniform regulatory treatment could be very important in the future.

D. 4.5

D. 8.3.1

2) Should these proposed rules take note of the Tax Code? A powerful economic incentive to set aside decommissioning funds in an economical way has been created by the 1984 Tax Act. The amount allowed for current tax deduction shall be the lesser of the "ruling amount" as determined by the IRS and the amount allowed to be collected in the utility's rates. However, some of the rules set forth therein are unclear. Of particular importance, the 1984 Tax Act is vague as to the precise definition of which costs shall be included in the "ruling amount," all decommissioning costs of a complete site restoration or only that portion of the costs required to decommission the radioactive portions of the power plant? In contrast, it is clear in these proposed rules that decommissioning means "to remove nuclear facilities safely from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license." There is a need to encourage the Secretary of the Treasury to make this section of the Tax Code clear.

D. 5

In summary, there are several parties at interest besides the Commission and the utility company as addressed in the proposed rule. Namely, the regulator and the IRS are also involved. The effectiveness of these proposed rules will be enhanced if an attempt is made to take into account the roles which might be played by the regulator in providing the source of funding from utility ratepayers and the IRS in allowing such payments by ratepayers to be current tax deductions for the utility.

D. 8.3.1

Additionally, this writer believes that pension funding experience can be used to illustrate that the preferred method of funding should be separate, external trust accounts which are funded by contributions from the utility company in conjunction with regulatory approvals and with recognition of use of the greatest tax deductibility allowed for such contributions by the IRS. The use of funds which are internally commingled with other corporate funds of the utility will not provide the degree of funding assurance sought by the commission.

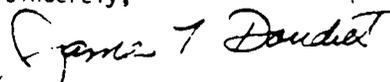
D. 3.2.2.3

D. 3.2.1.1 (a)

- 4 -

We hope these comments are useful in your deliberations.

Sincerely,

  
James T. Doudiet  
Manager Director

PROPOSED RULE FR-30,40,50 et al.  
(30 FR 5600) (47)

Mr. Alan Philbrook  
Governor's Special Committee  
on Decommissioning Maine Yankee  
Box 2627  
Augusta, Maine 04330

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Members of the Commission:

85 MAY 13 P3:24  
Though I am pleased to see that your commission has begun the process of creating uniform standards to govern the nuclear decommissioning process, there are several major problems with the proposed regulations which I wish to discuss with you.

In general, I find the proposed regulations broadly deficient in specific guidelines for assuring site safety and security during the decommissioning process or any storage period that may be approved by the commission in order to allow time for radioactive materials to decay. Procedures should be laid out in detail regarding such crucial operations as blasting, cutting, and packaging of waste for shipment. As a former nuclear operating engineer, I am all too aware of the many ways that safety concerns can slip through the cracks of any operation in the absence of specific rules. Such things as site perimeter barriers, radiation containment systems, and contingency plans in the event of accidental leakage should be addressed separately and specifically.

My intimate familiarity with the lengthy history of cost overruns in the nuclear industry suggests to me that your funding schemes may be wholly inadequate. I cannot believe that the \$100 million dollar figure will even come close to covering the cost of dismantling the larger reactors. This one-time payment option should not be allowed as an alternative unless and until practical experience has born out that it is more than adequate to insure complete and thoroughly safe decommissioning. Also, the "internal reserve" funding mechanism option must go. It is entirely too vulnerable to misuse by licensees, and may result in failure of funds to be made available even in the instance of good intentions, in the case of unforeseen insolvency.

G.1

C.1.11

C.1.3

D.1.1.1

D.2.1(a)

D.3.2.1.1(a)

ACKNOWLEDGEMENT  
MAY 15 1985  
Acknowledged by card.....

My most urgent concern is with the hazards to which the decommissioning workers are exposed. As you have correctly stated, the danger to workers is the most immediate threat posed by the decommissioning process. Your assertion that exposure to decommissioning workers is likely to be similar or less than exposure to workers at operating reactors may be correct. However, I cannot agree that the present standing policies are adequate to protect the decommissioning workers. As a former engineer employed by the atomic industry who is presently suffering from the effects of over exposure to radiation on the job (which was for a time effectively concealed from me), I am forced to conclude that present operating procedures are inadequately controlled, and that unless specific regulations on decommissioning workers are forthcoming, the trend will continue. Particularly odious is the practice of allowing "sponges" or "jumpers" to accumulate their maximum dose repeatedly at different job sites. This practice must not be allowed to continue into the decommissioning process.

C.1.8.1

Sincerely Yours,

*Alan Philbrook*

Alan Philbrook  
Governor's Special Committee  
on Decommissioning Maine Yankee

PROPOSED RULE *PK-30, 40, 50 et al* (48)

BOARD OF SUPERVISORS  
(408) 425-2201



COUNTY OF SANTA CRUZ

GOVERNMENTAL CENTER

701 OCEAN STREET SANTA CRUZ, CALIFORNIA 95060-4069

DAN FORBUS  
(FIRST DISTRICT)

ROBLEY LEVY  
(SECOND DISTRICT)

GARY A. PATTON  
(THIRD DISTRICT)

DOCKETED  
JSMRG  
E. WAYNE MOORE  
(FOURTH DISTRICT)

JOE CUCCHIARA  
(FIFTH DISTRICT)

'85 MAY 13 P3:25

May 8, 1985

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Docketing and Services Branch

RE: DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES,  
50 FEDERAL REGISTER 5600, FEBRUARY 11, 1985

Dear Ladies and Gentlemen:

I am writing this brief letter to comment on the proposed decommissioning criteria for nuclear facilities published in the February 11, 1985 Federal Register. I have the following comments:

1. The proposed regulations apparently would allow licensees to choose among three potential decommissioning methods: DECON, SAFSTOR, and ENTOMB. I believe that the choice of decommissioning method should not be left to the licensee but should be reviewed and approved by the Commission.
2. I believe that the ENTOMB decommissioning method should be disallowed, and not be presented as an alternative. The rule should forbid ENTOMB as a decommissioning method for power reactors.
3. The rule does not contain adequate standards which would minimize workers' exposure during decommissioning, and the rule does not require a registry of workers involved in decommissioning. I believe both should be added to the rule.
4. The rule would allow a "funding insurance" method which would permit an internal sinking fund with the assets in the fund mixed with the utility's other assets. This is an unsatisfactory proposal, since it would not protect such funds in the event of a utility bankruptcy. That option should be removed from the rule, and strictly speaking, only the "prepayment" option insures adequate decommissioning funding in the case of a premature shutdown. I think the Commission should strongly consider requiring prepayment as the only funding insurance option.

B.3.3

B.5

C.1.8.1

C.1.10

D.3.2.1.1(a)

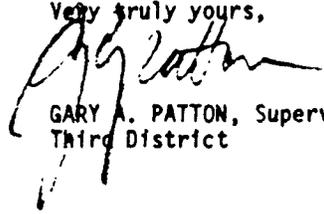
D.3.2.2.1

Acknowledged by card... MAY 15 1985 *pd*

Secretary of the Commission  
May 8, 1985  
Page 2

Thank you for allowing me to make these comments to you.

Very truly yours,



GARY A. PATTON, Supervisor  
Third District

GAP:ss

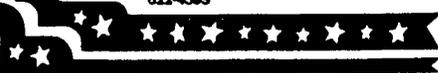
PROPOSED RULE PK-30,41,50 et al.  
(50 FR 5600) (49)



Mr. Alva Morrison; Staff Consultant on Radioactive Waste  
**Maine Nuclear Referendum Committee**

P. O. Box 2627 or  
335 Water Street  
Augusta, Maine 04330  
622-4305

"To the village square we must carry the  
face of atomic energy... from there must  
come America's voice."  
- Albert Einstein



DOCKETER  
USNRC

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington D.C. 20555

85 MAY 13 P3:26

Dear Commissioners:

As someone who has been intimately involved in all aspects of the problem of radioactive waste disposal, I welcome and applaud the steps you are taking to address the problem of decommissioning of nuclear facilities. There are several areas, however, in which I feel the proposed regulations you have circulated for comment are inadequate to insure the public health and safety, particularly given the fact that this is an area in which there is no prior practical experience from which problems may be anticipated and real costs may be reckoned.

OFFICE OF STATE AND  
GOVERNING & SERVICE  
BRANCH

Without going into exhaustive detail, I shall list below a number of areas in which I feel that insufficient clarity or detail is offered to provide guidance to licensees in carrying out effective decommissioning, and/or to assure that the public is provided with the tools they need in order to have input into the process:

-Licensing: Particularly in the case of Part 50, it is not clear what sort of license governs decommissioning, or at what stage that licence should be during the decommissioning process. This problem could be easily rectified if decommissioning were handled under new regulations as opposed to amendments to the existing ones.

-Choice of Method: Specific criteria should be promulgated by which licensees may decide which decommissioning method is appropriate to their situation.

-SAFSTOR Option: Time allowable for storage should be limited, and criteria should be listed by which decisions on timing can be made. Specific regulations governing plant saf-

G.1

C.1.1

C.1.3.1

B.3.1.1

B.4.3

C.1.3

MAY 13 1985  
Acknowledged by card..... *pd*

ty and security during the storage period, including all necessary financial assurances, are crucial.

-Workers Protection: Standards must be improved in this area unless and until it becomes clear that hazards of exposure are indeed as minimal as the commission anticipates.

-Safety and Security During Decommissioning: Strict standards for radiation monitoring of all personnel, work areas, and the area surrounding the plant must be established until it is clear that releases will indeed be as low as anticipated. Conditions for inspection of all aspects of the operation must be laid out in detail, and specific criteria regarding barriers, warning signs, and alarm systems must be promulgated.

Portions of the new proposed regulations dealing with funding for decommissioning, while more detailed, are also flawed in several aspects. To begin with, I feel that more detailed criteria are in order to define how the commission will decide whether the plans submitted by the licensee are acceptable. The establishment of a benchmark figure of \$100 million based on outdated studies which were made purely theoretically seems at best a questionable practice to me. Furthermore, at least one funding scheme is offered which is obviously inadequate even if the benchmark figure proves reasonable. The availability of funds from an internal reserve could never be guaranteed, particularly in those cases such as exist in our state where the major nuclear facility exists in a separate corporate structure from the utility which distributes the power generated. It is my view that this arrangement was specifically designed to allow the utility to escape responsibility for decommissioning in the event that costs should exceed those estimated. Under no circumstances should any funding method which offers even the possibility of such an occurrence be permitted.

In your own rationale for the proposed rule (Pg. 5606, under "D. Financial Assurance" ) you raise the spectre of premature shutdown and its potential effect on the availability of decommissioning funds, yet fail to address it effectively in the proposed regulations. For this reason, as well as my reasons given above for opposing the "internal reserve" funding mechanism, it

C.1.3  
D.3.4

C.1.8.1

C.1.9

D.8.1  
G.1

D.2.1(c)

D.1.1.1

D.3.2.1.1(a)

D.8.2.1  
D.8.2.2

D.3.2.2.1

is my view that the commission must, to demonstrate that it is serious about the need for those who profit from nuclear energy to be responsible for its costs, require that all funds for decommissioning be provided up front in separate, untouchable accounts, before issuing operating licenses (or within a strictly limited time period, in the case of those plants already in operation).

D.3.2.2.1

Turning to my particular area of expertise, I find that your discussion of decommissioning alternatives on page 5603 rests uncomfortably on the assurance that "The Federal and State governments have activities under way to assure that there will be this (disposal) capacity." Given the present state of Federal legislation concerning low level waste, this is at best an optimistic attitude. The primary focus of amendments presently being prepared to the Low Level Radioactive Waste Policy Act is to extend deadlines by which states must submit and carry out plans for disposal, and to limit access (by volume) to presently-operating disposal facilities. In addition, a consensus seems to be developing among State officials, industry, and the public in the entire northeastern region that shallow land burial will be utterly unacceptable as a means of disposal anywhere in the region due to geologic and hydrological factors. Yet to date, your commission has declined to offer guidelines for alternative methods of disposal.

H.1.1.1

Given this situation, it seems highly likely that pressures for extended use of the "SAFSTOR" option, and attempts to apply entombment technology to large reactors for which it may be entirely inappropriate are to be expected in the near future. I believe that if a crisis situation is to be avoided, your commission must address these issues in all relevant portions of the regulatory codes immediately.

B.5

Sincerely,

Mr. Alva Morrison  
Staff Consultant on  
Radioactive Waste

cc:State Sen. Judy Kany  
Chair, Maine Low-Level  
Waste Siting Commission

PROPOSED RULE PK-30, 40, 50 et al. (50)  
**COMMISSIONER'S OFFICE (50 FR 5600)**  
COUNTY OF BEDFORD, PENNSYLVANIA

JOSEPH H. CLAPPER JR.  
B. CESSNA  
Y. W. EBERSOLE  
County Commissioners  
Registration Commissioners  
County Board of Elections



BARRY R. SCATTON  
County Solicitor  
ARLENE J. ARNOLD  
Registrar  
PATRICIA M. CHAPIN  
Chief Clerk

DOCKETED  
USNRC

Telephone: 814-623-1173  
BEDFORD, PENNSYLVANIA 15522

'85 MAY 13 P3:27

May 10, 1985

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Docketing and Services Branch

RE: Decommissioning Criteria for Nuclear Facilities 50 Fed. Reg. 5600, February 11, 1985.

On May 7, 1985, the County Commissioners, of Bedford County Pennsylvania, unanimously voted to sanction the attached comments in response to the proposed regulations for the decommissioning of nuclear power facilities. This action was not taken in an extemporaneous manner. Both the regulations and the comments had been reviewed by the Commissioners and the County Planning Commission which also advised County Commissioners support.

The location of an inactive experimental nuclear power station in Saxton, Bedford County, has made us acutely aware of the health and safety issues. These concerns have been magnified by the State's newly acquired responsibilities in handling low-level radioactive waste problems. We want you to understand our adamant feelings regarding the opportunity for local input into the decommissioning activities through involvement in an Environmental Impact Statement.

F.1

Thank you for considering this joint statement from Bedford County.

Attest: Patricia M. Chapin  
Patricia M. Chapin, Chief Clerk

Joseph H. Clapper Jr.  
Joseph H. Clapper, Chairman  
Jay B. Cessna  
Jay B. Cessna, Vice-Chairman  
Gary W. Ebersole  
Gary W. Ebersole, Secretary

Acknowledged by card..... MAY 15 1985  
Bedford County, Pennsylvania - "the Crossroads of Heritage and Hospitality" *pd*

REVISED RULES 30, 40, 50 et al.  
(50 FR 5600)

(51)

CONCERNED CITIZENS  
FOR SNEC SAFETY  
c/o James H. Elder  
Wall St Ext  
Saxton, Pa 16678  
May 6, 1985

Secretary of the Commission  
US Nuclear Regulatory Commission  
Washington, DC 20555

'85 MAY 13 P3:27

Attention: Docketing and Services Branch

Re: Decommissioning Criteria for Nuclear Facilities  
50 Fed. Reg. 5600, February 28, 1985

Concerned Citizens for SNEC Safety is an organization which has been involved in representing local residents as regards the Saxton Nuclear Experimental Corporation's reactor during its dismantlement phase. Therefore we have a very personal stake in the NRC's regulations in this area. We have researched the problems involved in dismantlement carefully so that we can help local residents protect themselves from possible harm.

After studying the proposed rule for decommissioning we have concluded that it contains several serious flaws. It is surprising that a rule which has been worked on since 1977 is so lacking in specifics on the topic it addresses. The rule must be drastically modified to become an adequate framework for the decommissioning process. We will address this problem using the real experience of what has occurred at Saxton, where the plant was partially decommissioned in 1973 and then put into storage for eventual dismantlement.

The decision to change the present requirement for a full Environmental Impact Statement when a final decommissioning plan is developed and to substitute a review is not acceptable. The change in knowledge and techniques during the life of a reactor is considerable and there are certain to be vast differences between the original planning and the actual site-specific situation after 30 or 40 years. This is clearly the case at Saxton only 12 years after its initial decommissioning plan was developed.

In addition, the preparation of a full Environmental Impact Statement is the only guarantee that the site-specific knowledge of local government officials and citizens will be made a part of the plan which is carried out. It is important that the views of those most affected by decommissioning decisions, the local residents and workers, be made a part of the final plans.

The prime consideration in decommissioning decisions must be public health and safety since that is the legal mandate of the NRC. The proposed rule appears to give only lip service to this requirement. It is mentioned, but nowhere are methods or performance goals for achieving safe decommissioning written into the rule. Instead, this topic is left for later action by the

G.1

F.1

C.1.3

MAY 15 1985

acknowledged by staff.....

pd

NRC. when it should be the real substance of this rule.

One of the most important decisions in decommissioning is whether to use DECON (immediate dismantlement), SAFSTOR (temporary storage with later dismantlement) or ENTOMB (permanent on-site storage). Yet there is no criteria given in the rule for how to make the choice among these options. Even the information supplied with the rule makes a clear case for how to evaluate these options, but the rule itself gives no guidance.

ENTOMB is not a realistic alternative and the rule should state that. There will obviously be special reasons at particular sites to choose the DECON option because of reasons such as poor original siting of a reactor, but in general the evidence suggests that partial decommissioning followed by a 50-year storage period (SAFSTOR) will be the best option in terms of the public health and safety. Radiation exposure to workers and the surrounding area will be lower and, equally as important, there will be a significant reduction in the radioactive wastes produced.

While SAFSTOR might slightly increase the total cost of decommissioning, the public benefits justify that cost. The rule should require that the choice of method be based on a detailed assessment of the effects on public health and safety so that a rational decision can be made. There should be clear criteria available for NRC review of that decision. Again the need for preparation of a full Environmental Impact Statement as part of a final site-specific plan is shown to be justified.

Another extremely important part of the decommissioning process is not addressed by the rule at all. Proper requirements for quality assurance and quality control during decommissioning are essential, including adequate monitoring by the NRC itself. This need is very apparent at Saxton. The original work in 1973 was supposed to have cleaned up several auxiliary buildings for unrestricted use. The AEC did not inspect for 13 months while work progressed. When an inspection finally occurred it was discovered that the buildings remained contaminated. Since the owner (General Public Utilities) had already dispersed its workers, those buildings remain contaminated today. Strict requirements for quality assurance must be a part of the rule.

We cannot understand why the rule specifically excludes from its requirements reactors which have already been permanently shut down. Saxton falls into this category and we think we should receive as much protection as anyone else who lives near a reactor.

The experience at Saxton also casts severe doubt on the adequacy of the proposed rule for estimating the costs of decommissioning. In 1973 GPU estimated that the total decommissioning cost, excluding continued maintenance for SAFSTOR of the plant, would be \$575,000. Even after the initial decontamination work had been done, in 1983 GPU's minimum estimate of the cost for the remaining work was \$12,454,000 or more than 21 times the original total estimate. Obviously not all of this increase was due to inflation. Saxton is only a 35 thermal

C.1.3

B.3.1.1

B.5

B.4.2

B.3.1.1

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F.1

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C.9

D.1.1.1

megawatt reactor and GPU's cost estimates assume the reactor vessel can be removed in one piece. To think that \$100,000,000 is a maximum figure for decommissioning plants 300 to 400 times the size of Saxton is unrealistic.

The proposed rule should be changed to require a decommissioning fund equal to the best estimate possible for the cost of decommissioning a particular site, and that estimate should be revised every five years so that an appropriate fund can be built up. Otherwise when the time comes to actually decommission a plant only a fraction of the funds required may be available.

The experience of GPU in approaching bankruptcy, with its main assets being inoperable nuclear plants, indicates why the set-aside funding for future decommissioning must be in external sinking funds which are legally separate from a utility's other assets. GPU has not been able to get a blank check from Pennsylvania ratepayers even in its emergency situation and therefore its cleanup at TMI-2 has been delayed. If the funds it had set aside for future decommissioning were part of its normal assets there would be no money available today for work at Saxton. We appreciate the fact that the Pennsylvania Public Utility Commission requires external reserves for decommissioning funds and the NRC should require the same method, along with insurance to provide funding in case of the early retirement of a plant such as happened at TMI-2.

The definition given for the term "decommissioning" is not complete in the proposed rule. Since the objective of decommissioning is to return a site to the same possibilities of use that the site possessed before a reactor was built on it, the definition should include language stating that the limit for residual radioactivity remaining should be the amount of natural background radiation at the site before construction of the plant. This is the only definition which can be acceptable by local residents whose children will be using the site in the future.

To summarize, the proposed rule is not complete since it does not provide specific criteria for making decisions about decommissioning and it leaves out several important topics. The rule should be redrafted and again submitted for public comment before it is accepted by the NRC.

Sincerely,

James H. Elder  
Chairman

D.1.1.1

D.2.1(a)

D.4.3

D.3.2.1.1(a)

D.3.2.2.1

E.1.1

G.1

DOCKET NUMBER  
PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (52)

42 Highland Ave.  
Madison NJ 07940  
May 7, 1985

Secretary of the Commission  
US Nuclear Regulatory Comm.  
Washington, DC 20555

DOCKETED  
USNRC

Attn: Docketing and Service Branch

'85 MAY 13 P3:28

Gentlemen:

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

The NRC has issued an unacceptable proposal for decommissioning reactors as far as the general public is concerned which is unfair to the public's health and also to their pocketbook.

G.1

Entombment of radioactive wastes should never be allowed as the radio activity remains dangerous for hundreds of thousands of years, far outliving the housing for the contaminated wastes.

B.5

Long-lived activation products should be separated from low-lived waste sites for obvious reasons. Also, chemical contaminated wastes should be excluded from low-lived waste burial until interaction of chelating agents is thoroughly assessed. A 50 year limit should be established for the "temporary" storage of reactors prior to dismantlement.

H.1.1.1

H.1.2.1

B.4.3

Federal legislation is necessary to make the parent/<sup>holding</sup>company responsible for decommissioning costs. Prepayment held in segregated funds without decommissioning insurance is the only sure way to avoid possible non-availability of funds due to premature shutdown or a utility not having the necessary money when the time arrives for decommissioning. Allow current tax deductions only for segregated funds to protect the utility customers from having to pay for utility tax expenses on the decommissioning funds when the utility will eventually be eligible for a tax deduction.

D.8.2.1

D.3.2.2.1

D.5

Revise decommissioning cost estimates at least every five years.

D.4.3

Presently, I would not want anyone I am fond of working in a nuclear facility. The maximum level of radiation exposure allowed should be decreased ten-fold and records should be kept on all workers regarding radiation exposure. The Federal standard should be set at a 10 millirem limit for residual radioactivity full body dose at plants released for "unrestricted" use.

H.3

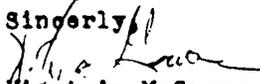
C.1.10

E.1.1

Finally, if decommissioning costs run higher than funds available, utility stockholders should be responsible to pay the costs, not ratepayers who never benefitted from the electricity produced by the plant which is no longer operable. If the NCR fails to require plants to adopt the most reliable funding method, state regulators should step in and request either prepayment or segregated external funds for reactors in their state.

D.8.2.2

D.8.3.1

Sincerely,  
  
Virginia McGowan

MAY 15 1985  
Acknowledged by card.....

Atomic Industrial Forum, Inc.  
7101 Wisconsin Avenue  
Bethesda, MD 20814-4805  
Telephone (301) 654-9260  
TWX 7108249602 ATOMIC FOR DC

PROPOSED RULE PR-30, 40, 50 et al  
(50 FR 5600) (53)

COMMUNICATIONS SECTION

May 10, 1985

'85 MAY 13 P3:49

RECEIVED  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

ATTENTION: Docketing and Service Branch

SUBJECT: Proposed Decommissioning Criteria for Nuclear Facilities

Dear Sir:

The AIF Committee on Radionuclides and Radiopharmaceuticals is composed of licensees who possess, process and distribute radioactive materials. These companies conduct diverse operations under their respective licenses which are issued under one or more of Parts 30-35, 40, 50, and 70 of Title 10 of the Code of Federal Regulations and the licensed activities involve the full spectrum of available types and quantities of radioactive material. As a consequence, the proposed regulation will affect each licensee in a manner and to an extent which is unique to the particular licensed activities. Some aspects of the proposed rule will have a common impact on all licensees. The Committee's comments that follow are addressed mainly to the latter. We expect individual company comments will be forthcoming on the former.

The Commission specifically invited comments from small entities concerning the economic impact of the proposed rule. It is not easy to differentiate between small and large entities. Although many licensees are affiliated with larger more diverse enterprises, other than the licensed activity, it is common that the licensed enterprise operates as an independent profit center. The impact on any licensee is more closely related to the operating budget of the licensed activity rather than to the consolidated budget of all affiliates. The comments of the Committee are offered from this perspective.

Any projection of decommissioning costs is dependent on the existence and accessibility of disposal facilities. It is also dependent upon the stability of the cost of disposal services and the regulatory environment. Unfortunately, none of the above exist nor can they be guaranteed in the near future. The formation of compacts

D.1.1.1

MAY 10 1985

Acknowledged by card ..... pd

under the Low-Level Waste Policy Act is behind schedule and this won't be resolved over the next several years. When the compact system is fully implemented, the cost of disposal will continue to rise due to the relatively lower volumes of waste going into the individual sites within the newly formed compacts. Furthermore, there are several kinds of waste for which disposal methods have not yet been defined in the regulations. These conditions will greatly hinder an accurate assessment of future decommissioning costs.

D.1.1.1

The proposed rule will require a decommissioning funding plan to be filed by licensees if they are authorized to possess more than  $10^5$  times the quantities listed in 10 CFR Part 20, Appendix C. Licensees may certify that they have satisfied the financial security requirements amounting to \$500 K, \$100 K, or \$50 K depending upon the possession limits of their respective licenses. We note that the multiples of the Appendix C quantities of some isotopes amount to absolute quantities which are less than a curie. We do not believe that the decommissioning costs for such a license could amount to the sums prescribed in the proposed regulation. The only way a licensee may avoid the cost of providing the assurance in the prescribed amount would be to file a specific plan. The cost of doing this should be avoided for the benefit of both the licensee and the NRC. We believe that either the quantity limits for prescribed amounts of financial assurance in Part 30.35 be set more realistically or the prescribed radioactive quantity be increased for the certification provision in the rule. Comparable sections of Parts 40 and 70 should also be revised.

D.6.3.1

D.6.2.2

D.6.3.1

We are in favor of the exemption provisions based on the quantity and half life of the material that licensees are authorized to possess. This exemption will greatly relieve the majority of by-product licensees of the administrative burden and added cost that this rule will impose.

D.6.1

Some licensees are licensed under more than one part of Title 10 of the Code of Federal Regulations and operations under separate licenses are conducted within common facilities. As the proposed rule is written, a separate decommissioning plan may be required under each license. This duplication will lead to unnecessary additional cost to both the regulatory agency and the licensee. It is recommended that the rule clearly state that a consolidated plan be allowed if multiple licenses exist.

C.11

May 10, 1985

The proposed rule would amend Parts 30, 40, 50 and 70 to require licensees to maintain an additional set of records for purposes of identifying those plant areas that would require special attention during decommissioning. These records would be redundant. Such information would be on record from the normal operating logs that are kept for recording radiation exposure history. Considering the fact that licensed activities are carried out only in controlled areas of the plant and also that a detailed survey of these areas, and most probably the adjacent unrestricted areas, will be conducted per any decommissioning plan, the duplicate records required in the proposed regulation will not be necessary for the safe and effective decommissioning of a facility.

C.7.1

The Commission mentions in the background information for this proposed rule that a 100-year waiting period would be considered an acceptable time for institutional control if the Safstor or Entomb option were chosen. Some benefit may be gained in extending this period beyond 100 years in special circumstances. A precedent exists for a 300-year period in 10 CFR Part 61. It is recommended that, provided reasonable institutional control can be assured and a significant benefit will result, the Commission allow a longer waiting period.

B.4.3

B.5

The proposed rule specifies certain funding methods that would be acceptable to the Commission. There is also provision for providing financial assurance by means other than those specified which would provide comparable assurance. As stated earlier, licensed activities generally are financially accountable under distinct profit centers and the cost of providing financial assurance under the specified methods is significant within the context of these profit centers. The preferred method for providing assurance will invariably be that which costs the least.

D.6.4.1.1

The cost of the various funding methods is generally tied to the cost of money. Most licensees can provide a greater return on investment through their own enterprise rather than from external investments and the surety method would seem to be even more costly.

The internal fund is apparently the least expensive funding method and, therefore, it is the most desirable from the licensee's perspective. According to the rule, only utility companies are specifically permitted to use this method. We recommend that the choice of funding method be dependent on the financial condition and potential of

Secretary

-4-

May 10, 1985

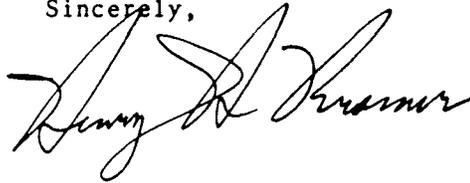
the licensee to carry out decommissioning rather than on the type of licensed enterprise.

The internal funding method could be made available to licensees other than utility companies provided certain financial criteria were satisfied. A precedent exists for this in Title 40 CFR Parts 264 and 265. We recommend that the NRC consider adopting a similar approach when assessing adequate funding methods for all licensees.

D.6.4.1.1

We believe that the above suggested changes will not compromise the efficacy or intent of the proposed rule if they are adopted. The AIF Committee on Radionuclides and Radiopharmaceuticals appreciates this opportunity to comment on the proposed rule.

Sincerely,



Henry H. Kramer  
Chairman, AIF Committee  
on Radionuclides and  
Radiopharmaceuticals

HHK:wpg

CKET NUMBER  
PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (54)

1215 First Ave. 4A  
New York NY 10021  
May 6, 1985

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington DC 20555

Attn: Docketing & Service Branch  
Dear Secretary: 85 MAY 13 P3:29

I am writing in reference to the proposed rules on nuclear-plant decommissioning. I oppose the use of unsegregated decommissioning funds by utilities, and entombment as a method of decommissioning.

D.3.2.1.1(a)  
B.5

Since little is known about costs for shutting down a reactor, a major independent study of these costs should be undertaken by the Congressional Office of Technology Assessment. In any case, the costs should be prepaid in segregated funds so utilities, if they have financial problems later, could still be called on to clean up the reactor. An Environmental Impact Statement should be required for every nuclear-plant decommissioning with full opportunity for public comment.

G.16  
D.3.2.2.1  
F.1

Entombment--one of the options for decommissioning--is unacceptable, since some of the isotopes in the reactors stay radioactive for thousands of years--past the life of the concrete used to close up the plants. Reactors should be given full decommissioning, immediate dismantlement.

B.5  
B.4.2

Very truly yours,

Bill Schwarz  
Bill Schwarz

MAY 15 1985

Acknowledged by Card..... pd

May 9, 1985

(50 FR 5600) (55)

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

DOCKETING  
USNRC

Attn: Docketing and Services Branch

Dear Secretary:

'85 MAY 13 P3:28

The following are comments on the proposed rules titled "Decommissioning Criteria for Nuclear Facilities" and reference to #50 Fed. Reg. 5600. In general we are pleased that the issue of decommissioning is being addressed. However, there are several important factors that must be corrected if the public is to be protected financially and environmentally.

G.1

The proposed rules allow the utilities to choose among three potential decommissioning alternatives but do not specify what factors should be considered when making that choice. Without these specific criteria there is no basis for regulating or reviewing the utility's performance. The ENTOMB method should be forbidden since it is contrary to the requirement of returning the site to unrestricted public use. It is also the method most likely to result in long term environmental damage. Any decommissioning plan should require an environmental impact statement from the utility as part of its NEPA responsibilities. This EIS should be required at the time the utility submits its plan for decommissioning, and the public should be allowed to comment.

B.3.1.1

B.5

F.1

Occupational radiation exposure during decommissioning will be substantially higher than in normal utility operations. The rules must specify standards to minimize worker exposure during decommissioning and require registry of workers. This registry of workers is vitally important to prevent individuals from receiving repetitive maximum doses by transferring from one nuclear clean-up site to another.

C.1.8.1

C.1.10

The current rules lack any mention of quality control or quality assurance procedures. There should be specific basic safety practice required and an independent means of verifying that these procedures are being followed. The utilities should be required to include methods of meeting those safety criteria in their decommissioning application.

C.6

Probably one of the most crucial aspects of decommissioning is that the utilities set aside sufficient segregated funds to accomplish the work. The cost of decommissioning should be re-evaluated every five years by the utilities, reviewed by the N.R.C., and sufficient funds segregated for this purpose. The regulations regarding funding methods available to utilities should require segregated funds. Without this protection, there is very little assurance to the public that decommissioning funds will be adequate and protected from bankruptcy or other claims.

D.4.3

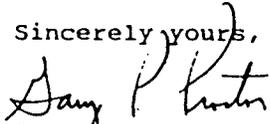
D.3.2.1.1(a)

MAY 13 1985  
Acknowledged by the .....  
pd

It is conceivable that the cost of decommissioning these power plants could match or exceed the original construction costs. The potential public health consequences are staggering. The N.R.C. must make these rules to err on the side of protecting the public rather than meeting the desires of the nuclear industry.

D.I.I.I

Sincerely yours,



Gary P. Proctor  
N. 15616 Timberwood Crt.  
Spokane, WA. 99208  
509 466-5898

# CASE

(CITIZENS ASSN. FOR SOUND ENERGY)

1426 S. Polk  
Dallas, Texas 75224

214/946-9446

DOCKET NO. 10  
PROPOSED RULE FR-30,46,50 et al  
(50 FR 5600) (56)

DOCKETED  
USNRC

'85 MAY 13 P2:13

Mr. Samuel J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

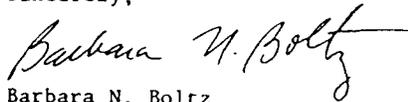
OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

May 10, 1985

Dear Mr. Chilk:

Attached is a copy of CASE's comments on the NRC's proposed decommissioning rule ("Decommissioning Criteria for Nuclear Facilities", 50 Fed. Reg. 5600, February 11, 1985).

Sincerely,



Barbara N. Boltz  
Boardmember  
CASE (Citizens Association for Sound Energy)

/bb

enc.

Administrative Services

COMMENTS ON PROPOSED DECOMMISSIONING RULE

Introduction

CASE wishes to comment on certain aspects of the NRC's proposed rule entitled, "Decommissioning Criteria for Nuclear Facilities" (50 Fed. Reg. 5600, February 11, 1985). CASE concurs that there is a need to set forth specific criteria for the methods to fund and carry out the decommissioning of nuclear facilities, including power plants, but does not concur that the rule in its present form will ensure either that funds will be available when needed or that the effort will be carried out in a manner that will protect the health and safety of the workers or the public.

D.8.1  
G.1

General

CASE generally supports NIRS' comments regarding the need for the setting of appropriate radiation standards for decommissioning workers, the need for promulgating specific regulations with which applicants must comply in order to enable intervenors in decommissioning hearings to evaluate whether or not a licensee complies with the law, the need for developing a framework of safety goals paralleling existing NRC regulations for nuclear power plant operations, the need for developing substantive rules for the proper procedures to be used in conducting decommissioning, the need for requiring that a QA/QC program be an integral part of any decommissioning implementation, and the need for establishing specific criteria for the choice of a decommissioning method by a utility. CASE believes that the choice of decommissioning alternatives is too important to leave to the discretion of a licensee (per the proposed rule), and urges that the Commission define the selection criteria in such a way so as to provide the maximum assurance that the public's and the workers' health and safety is pro-

C.1.8.1

C.1.3

C.1.4

C.1.3

C.6

B.3.1.1

tected.

CASE concurs that rules requiring beneficial operating procedures and design features that make decommissioning easier should be developed. We would refer the Commission again to NIRS' comments regarding areas for proposed regulations which would speed up decommissioning, reduce occupational exposure, speed up accident clean-ups, and reduce waste.

C.8

CASE also urges that the Commission make explicit in the final rule that the ENTOMB option is unacceptable for nuclear power plants, and that the rule will not exclude any reactor which is already shut down at the time that the rule goes into effect.

B.5

C.9

CASE notes, in passing, that the rule, as proposed, assumes that a utility will follow basic safety criteria when carrying out a decommissioning. The Commission has not made that assumption for operating plants; it should not make it for retired units.

C.1.3

#### Funding

CASE wishes to comment on what we feel are deficient funding standards in the proposed rule, in particular, the option of an internal reserve. CASE believes that this scheme will not provide reasonable assurance that a utility will have adequate resources when needed to carry out decommissioning. CASE strongly opposes permitting the establishment of an internal reserve account which is not segregated from the licensee's assets and which is within the licensee's control. "Premature decommissioning" (an apparent euphemism for decommissioning due to serious accidents or to reactors otherwise beyond repair), or financial insolvency or even bankruptcy would place such unsegregated funds at serious risk. While no utility to date has actually gone bankrupt, several are in serious financial difficulty (cf., the utilities for Seabrook and TMI-2). (In the case of TMI-2, which operated only a few months, only the prepayment

D.3.2.1.1(a)

D.3.2.2.1

D.3.2.1.1(a)

option would have assured funds for decommissioning.) Nor does the proposed rule specify that investments be made in facilities other than other nuclear power plants--thus allowing the decommissioning burden for the second plant to shift to a later date and another group of ratepayers (since the second plant will also have to be decommissioned).

D.3.2.1.1(a)

CASE also notes that the text of the proposed rule does not contain a requirement for a utility using the internal reserve option to have backup insurance. But even this would not necessarily provide sufficient coverage to ensure that the cost of decommissioning would be available in the event of an accident, for 50.54 (w) covers only "on site" accident costs.

It appears that both the internal reserve and external sinking funds proposals suffer from the same flaw: both assume that a licensee will be able to continue to make deposits to a decommissioning fund over the life of the plant. As noted earlier, if a plant shuts down (for whatever reason) and is no longer revenue-producing, the licensee may no longer be able to continue to make deposits to the decommissioning fund, and decommissioning funding may then be in question. CASE urges, therefore, that any funding scheme that relies on deposits being made over time be backed up by insurance for premature shutdown. (The coverage could decline over time--if 5-year updates of estimates of decommissioning costs show that the fund is on target--to reflect the higher balance existing in the externally held account.) But CASE strongly urges the Commission to completely eliminate the option for internal reserve funding from the final rule. The public needs the protection which is inherent in a guaranteed fund which ensures that a utility can, in fact, decommission a plant safely when the time comes--whenever that may be.

D.3.2.2.1

CASE is further concerned that there is no mechanism in the proposed rule which would "lock in" a licensee to fulfill a commitment to immediately de-

D.3.2.1.2

commission a plant, if it had taken the relatively cheaper internal reserve funding option at the beginning of operation. There is nothing in the proposed rule which would prevent a licensee from defaulting on its commitment and taking advantage of the SAFSTOR option (which, according to the proposed rule, is supposed to be available only to utilities which accrue external funds). This is another reason to eliminate the internal reserve option from the proposed rule.

D.3.2.1.2

CASE further believes that the proposed \$100 million minimum (adjusted annually per the proposed rule) which licensees would be required to set aside for decommissioning is unrealistically low. (CASE concurs with NIRS' data and analysis presented in its comments regarding this concern.)

D.2.1(a)

CASE is also concerned that the proposed rule does not require that the utility assure accurate decommissioning updates during the time which it is collecting funds. From a financial standpoint, this could result in a form of rate-shock at the time of decommissioning, and from a health and safety standpoint, it could even jeopardize the timing and the quality of the decommissioning effort. CASE concurs with NIRS that it does not make sense to allow a 25-30 year gap between the original and final estimates (the first done at licensing (or, for operating reactors, 2 years after promulgation of the final rule); the second done 5 years prior to decommissioning. CASE urges that the Commission require an update of estimated decommissioning costs every 5 years, coupled with any changes necessary to arrive at the revised amount at the plant's estimated retirement date.

D.4.3

May 8, 1985

PROPOSED RULE 1.17, 40, 50 & 10.1  
(50 FR 5600) (57)

Secretary of the Commission  
US NRC  
Washington DC 20555

ATTN: Docketing and Service Branch

DOCKETING  
USNRC

Gentlemen: RE: Decommissioning Criteria for Nuclear Facilities. - Proposed Rule

85 MAY 13 P3:54

1. The \$100 million (1984) estimate of the cost of decommissioning nuclear power plants is surely a gross underestimation. Decommissioning costs will most likely vary widely from plant to plant. You need to come up with a more reasonable figure for decommissioning and utilities should be required in the rule to re-evaluate estimates every five years and adjust their funds accordingly, to ensure sufficient funds.

D.1.1.1

D.4.3

2. The prepayment fund or method is the only option that ensures adequate decommissioning funding. An accident early in the life of a nuclear power plant would make the external sinking fund or the two types of internal funds inappropriate. If utilities want to build nuclear plants, funds should be available in a lump sum such that the principal and interest will equal the estimated decommissioning costs (in current dollars). Funds should be placed in an account segregated from the utilities' other assets.

D.3.2.2.1

3. Your definitions of the alternatives of DECON, SAFSTOR, and ENTOMB are vague and need further clarification. The rule should forbid ENTOMB as a decommissioning method for power reactors. For DECON and SAFSTOR there needs to be guidance in the rule as to how the utility should make the choice. The rule should spell out specific criteria by which a utility's decisions can be governed and reviewed. Discussion of decommissioning methods in Regulatory Guides is not good enough as the guides are not binding like regulations. Therefore, this information should appear in the rule.

B.2.1

B.3.1.1

4. You need to develop standards to minimize worker exposure during decommissioning and should require a registry of workers involved in decommissioning. The establishment of a separate quality assurance and quality control staff for decommissioning needs to be required and procedures for quality assurance and quality control need to be detailed. The rule should spell out basic essential safety practices and the licensee's decommissioning application should be required to include methods of meeting those safety criteria.

C.1.8.1

C.1.10

C.6

C.1.3

5. The proper classification and disposal of "intermediate-level wastes" should be made. Intermediate level wastes should not be allowed to be disposed of in low-level waste dumps. Guidance for the proper disposal of chemical "chelating agents" which allow radioactive wastes to migrate quickly through the ground as in happening from the deep well injection process for waste used at Oak Ridge where radioactivity began showing up in nearby water wells at concentrations 138,000 times the drinking water standards and is doubling every five months according to The Natural Rights Center.

H.1.1.1

H.1.2.1

Sincerely,

*Naomi Jacobson*

(Mrs.) Naomi Jacobson  
Co-Chairman & Director  
LAND, Inc.  
525 River Road  
Rudolph, WI. 54475

NFJ

MAY 13 1985 pd



Bedford County Conservation District

120 W. JOHN STREET BEDFORD, PENNSYLVANIA 15522 TELEPHONE (814) 623-6706

DOCKET NUMBER  
PROPOSED RULE PR-30,40,50 et al (58)  
(50 FR 5600)

DOCKETED  
USNRC

May 9, 1985

'85 MAY 13 P3:51

Secretary of the Commission  
US Nuclear Regulatory Commission  
Washington, DC 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Services Branch

Re: Decommissioning Criteria for Nuclear Facilities  
50 Fed. Reg. 5600, February 11, 1985

The Bedford County Conservation District is a local organization which has been closely following events regarding the Saxton Nuclear Experimental Corporation's (SNEC) reactor during its dismantlement phase. We have, therefore, some concerns about the NRC's regulations in this area.

After studying the proposed rule for decommissioning we have concluded that it contains several serious flaws. The Concerned Citizens for SNEC Safety (CCSS) has brought to our attention that the rule is lacking in specifics and must be drastically modified to become an adequate framework for the decommissioning process. The Conservation District Directors, on April 24, passed a resolution which contains the following concerns.

Changing the present requirement for a full Environmental Impact Statement when a final decommissioning plan is developed, and to substitute a review, is not acceptable. The refining of knowledge and techniques during the life of a reactor is considerable, and there are certain to be vast differences between the original planning and the actual site-specific situation after 30 or 40 years. This is the case at Saxton only 12 years after its initial decommissioning plan was developed. The preparation of a full Environmental Impact Statement is the only guarantee that local government officials and citizens will have input into the plan which is carried out. It is important that the views of those most affected by decommissioning decisions, the local residents and workers, be made a part of the final plans.

Public health and safety seem to be inadequately referred to in the proposed rule. This topic is left for later action by the NRC, when it should be the real substance of this rule. One of the most important decisions in decommissioning is whether to use DECON (immediate dismantlement), SAFSTOR (temporary storage with later dismantlement) or ENTOMB (permanent on-site storage). Yet there are no criteria given in the rule for how to make the choice among these options. Even the information supplied with the rule makes a clear case for how to evaluate these options, but the rule itself gives no guidance. The Conservation District honors the opinion of (CCSS) that partial decommissioning followed by a

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E.1.1

B.3.1.1

B.4.2

CONSERVATION · DEVELOPMENT · SELF GOVERNMENT

Acknowledged by card..... MAY 15 1985 pd

30-year storage period (SAFSTOR) will be the best option in terms of the public health and safety. While SAFSTOR might slightly increase the total cost of decommissioning, the public benefits justify that cost. The rule should require that the choice of method be based on a detailed assessment of the effects on public health and safety. There should be clear criteria available for NRC review of that decision. The need for a full Environmental Impact Statement, as part of a final site-specific plan, is shown to be justified.

Quality assurance and quality control during decommissioning are not addressed by the rule. According to CCSS, the need for such requirements is very apparent at Saxton:

"The original work in 1973 was supposed to have cleaned up several auxiliary buildings for unrestricted use." The site was not inspected for 13 months while work progressed. "When an inspection finally occurred it was discovered that the buildings remained contaminated. Since the owner (General Public Utilities) had already dispersed its workers, those buildings remain contaminated today."

Strict requirements for quality assurance must be a part of the rule.

The rule specifically excludes from its requirements reactors which have already been permanently shut down. Saxton falls into this category and the local people feel that they should receive as much protection as anyone else who lives near a reactor.

Estimation of decommissioning costs has already been a problem at Saxton. In 1973 GPU estimated that the total decommissioning cost, excluding continued maintenance for SAFSTOR of the plant, would be \$575,000. Subsequent to initial decontamination work, in 1983 GPU's minimum estimate of the cost for the remaining work was \$12,454,000 (more than 21 times the original total estimate!). Saxton is only a 35 thermal megawatt reactor and GPU's cost estimates assume the reactor vessel can be removed in one piece. Setting a figure of \$100,000,000 as a maximum figure for decommissioning plants 300 to 400 times the size of Saxton is unrealistic. The proposed rule should require a decommissioning fund equal to the best estimate for the cost of decommissioning; that estimate should be revised every five years so that an appropriate fund can be built up. The experience of GPU in approaching bankruptcy, with its main assets being inoperable nuclear plants, indicates why the set-aside funding for future decommissioning must be in external sinking funds which are legally separate from a utility's other assets. The Pennsylvania Public Utility Commission requires external reserves for decommissioning funds and the NRC should require the same method, along with insurance to provide funding in case of the early retirement of a plant.

The definition given for the term "decommissioning" is incomplete in the proposed rule. The objective of decommissioning is to return a site to the same potential use that it had before a reactor was built on it; therefore, the definition should include language stating that the limit for residual radioactivity should be the amount of natural background radiation at the site before construction of the plant.

B.4.2

B.3.1.1

F.1

C.6

C.9

D.1.1.1

D.4.3

D.3.2.1.1(a)

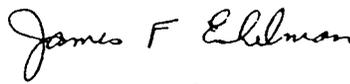
D.3.2.2.1

E.1.1

In summary, the proposed rule is not complete since it does not provide specific criteria for making decisions about decommissioning, and it leaves out several important topics. The Bedford County Conservation District suggests that the rule be redrafted and resubmitted for public comment before it is accepted by the NRC.

G.1

Sincerely,



James F. Eshelman  
Chairman

cc. James H. Elder

PROPOSED RULE 1.11-30, 40, 50 et al  
(50 FR 5600) (59)

# CORP

## Citizens Opposed to Radioactive Pollution

USNRC

Secretary of the Commission on Docketing and Services Branch  
Nuclear Regulatory Commission Reg. #50, Federal Register 5600  
Washington, D.C. 20555 Proposed rule for Decommissioning  
Criteria for Nuclear Facilities.

OFFICE OF SECRETARY  
DOCKETING & SERVICES  
BRANCH

### On Decommissioning Methods

We believe that SAFSTOR should be the only method sanctioned for decommissioned nuclear plants. All high and intermediate level radioactive wastes, and most so-called low level wastes, must of necessity be in retrievable, monitored storage, given the absence for the foreseeable future of any storage systems which have been proved to be permanently impermeable.

B.4.2

H.1.1.4

### On Funding Assurances and Costs

We believe the estimate of \$100 million as the cost of decommissioning to be unrealistically low. The record of the nuclear power industry in constantly underestimating construction costs by huge factors, gives no assurance of their reliability in estimating decommissioning costs, particularly with an undeveloped technology.

D.1.1.1

We also consider it to be absolutely essential that funds for decommissioning be required to be placed in segregated escrow accounts, unavailable for any other purpose. Even if a utility has avoided bankruptcy, when a plant is no longer generating income, there is a very high probability for dereliction and delinquency, leaving long-term care to be added to the national debt and national danger.

D.3.2.1.1(a)

D.3.2.1.2

*Miriam Lee Targ*  
Miriam Lee Targ, President  
C.O.R.F.

*Evelyn Cheslow*  
sig/ Evelyn Cheslow,  
Vice president

May 7, 1985

P.O. BOX 5  
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TELEPHONES:  
(312) 432 8247, 9411, 3133

MAY 11 1985  
*pd*

PROPOSED RULE PK-30,40,50 ea/  
(50 FR 5600) (60)

PACIFIC GAS AND ELECTRIC COMPANY

PG&E + 77 BEALE STREET • SAN FRANCISCO, CALIFORNIA 94106 • (415) 399-1000 TWX 910-372-6587  
USNRC

JAMES D. SHIFFER  
VICE PRESIDENT  
NUCLEAR POWER GENERATION

May 10, 1985

85 MAY 13 P2:11

PGandE Letter No.: ~~DATE~~ OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

ATTN: Docketing and Service Branch

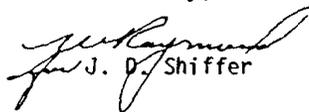
Re: Comments on the NRC's Proposed Rule Regarding Decommissioning Criteria  
for Nuclear Facilities (50 Fed. Reg. 5600 (February 11, 1985)).

Gentleman:

Pacific Gas and Electric Company has reviewed the subject proposed rule. Our  
comments are enclosed.

Kindly acknowledge receipt of this material on the enclosed copy of this  
letter and return it in the enclosed addressed envelope.

Sincerely,

  
J. D. Shiffer

Enclosure

cc: J. B. Martin

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PDR PR  
30 50FR5600 PDR

Acknowledged by card... MAY 15 1985

ENCLOSURE

The following comments by Pacific Gas and Electric Company (PGandE) address the Commission's proposed rule on "Decommissioning Criteria for Nuclear Facilities." As a member of the Utility Decommissioning Group, PGandE supports the comments filed separately by that group. Accordingly, the group's comments will not be repeated here.

The summary explanation of the proposed rule states that the amendment is intended to set forth "...technical and financial criteria for decommissioning of licensed facilities." However, while the rule itself extensively discusses financial assurance requirements and funding mechanisms for decommissioning, it provides little guidance regarding the technical requirements for decommissioning a nuclear facility. While matters such as amendment of licenses to possession-only, definitions of decommissioning alternatives, and a very general description of the contents of a decommissioning plan are discussed in the supplementary information section, they are not specifically addressed in the proposed rule.

C.1.3

The background information furnished with the proposed rule states that "...current regulations cover the requirements and criteria for decommissioning in only a limited fashion." A rulemaking that promulgates decommissioning criteria should provide guidance specifying those regulatory requirements applicable to facilities undergoing decommissioning. This regulatory guidance should be applicable to all decommissioning alternatives including, most importantly, those alternatives involving a delay in decommissioning completion.

Specific comments are as follows:

1. Proposed Section 50.82 (b)(1) states that "Alternative methods for decommissioning which significantly delay completion of decommissioning such as use of a storage period, will be acceptable if sufficient benefit results;..." However, other factors such as the necessity to store spent fuel onsite due to lack of a spent fuel repository or interim storage facility may also result in the selection of such an alternative. This factor may not be classed as a "benefit" and, as such, does not appear to be considered in the rule. This section should be revised to change the phrase "sufficient benefit results" to "sufficient justification exists or benefit results."
2. Proposed Section 50.82 (b)(2) states that the decommissioning plan must include "A description of controls and limits on procedures and equipment to protect occupational and public health and safety." These controls and limits should only be those which would be required or changed as a result of decommissioning. For example, health physics and radiation protection programs would not be anticipated to change significantly from those already in effect during operation. These programs should not be required to undergo additional NRC review and approval before they can be used for decommissioning.

B.3.1.1

C.3

the present practice of amending an operating license to one of possession-only would continue. Such a license is not defined in the regulations and it is not made clear how such facilities would be required to respond to regulatory actions specified for "...facilities licensed pursuant to Part 50." It is also not clear which activities authorized by an operating license would not be permitted under a possession-only license. Presently, such guidance is determined on a case-by-case basis as part of the license amendment process. Clarification in the regulations or in other regulatory guidance would permit better evaluation of decommissioning alternatives.

C.1.6

4. The supplementary information section also states that the details of a quality assurance program should be provided; however, criteria for such a program are not provided. Since existing criteria for quality assurance programs concentrate, for the most part, on operating facilities, some further guidance should be provided. Furthermore, changes to procedures for safeguarding special nuclear material(s) should be included in the decommissioning plan when appropriate. Part 73.55 is presently applicable to each licensee who is authorized to operate a nuclear power reactor pursuant to Part 50, while Section 73.50 is applicable to a facility other than a nuclear reactor facility licensed pursuant to Part 50. It is not clear what requirements would be applicable to a facility undergoing decommissioning. A similar lack of guidance exists for site emergency planning, operator training, and plant staffing requirements.
5. The proposed rule states that acceptable levels of radioactivity for release of a facility for unrestricted use are to be established through separate rulemaking. Such limits are necessary to properly plan for decommissioning and, as part of the planning for the termination radiation survey, are required to be in a decommissioning plan.
6. There is no consideration given for alternative actions to be taken if either the financial plan or the decommissioning plan is not approved, or if a utility is unable to establish a decommissioning fund as required. The rule does not specify, for instance, whether the federal government would then be responsible for decommissioning, with the utility ultimately financially responsible, or whether the facility would remain in the status quo indefinitely until further action is taken.
7. Regulatory guidance should be provided which delineates the criteria to be applied by the decommissioning study as the basis for a decommissioning funding plan. In the supplementary information section it is stated that periodic technical reviews of information contained in preliminary plans or cost estimates for a funding plan would be submitted to the NRC for approval (50 Fed. Reg. 5608 Co. 2). However, the requirement to submit the results of the periodic reviews is not contained in the rule and, in any event, such a requirement appears unnecessary. The cost estimate which is required to be submitted 5 years prior to the end of the license period should be sufficient to accomplish this purpose.

C.6

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D.4.2.2

D.2.1(c)

D.4.3

reviewed and approved prior to the start of major decommissioning activity. It is not clear what is considered to be major decommissioning activity.

C.1.5

Accordingly, PGandE respectfully requests that the Commission's proposed rule be modified in accordance with the foregoing comments.

PROPOSED RULE ... (50 FR 5600) (61)

LAW OFFICES OF  
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85 MAY 13 1985  
DIRECT DIAL (202)

OFFICE OF SECRETARY  
COOKETTS BRANCH

Mr. Samuel J. Chilk  
Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Re: Proposed Rule Regarding Decommissioning  
Criteria For Nuclear Facilities, 50 Fed.  
Reg. 5600 (February 11, 1985)

Dear Mr. Chilk:

These comments address the Commission's proposed rule on Decommissioning Criteria for Nuclear Facilities, 50 Fed. Reg. 5600 (February 11, 1985), and are submitted by the Utility Decommissioning Group ("UDG"). UDG consists of 13 power reactor licensees and the Edison Electric Institute.<sup>1/</sup> UDG has participated and filed comments at each stage of the decommissioning rulemaking since its inception in 1978, and UDG's members have a substantial interest in the Commission's proposed rule.

I. SUMMARY AND INTRODUCTION

The proposed rule on decommissioning nuclear facilities is quite comprehensive and reflects considerable effort by the Commission and its Staff. Many aspects of the proposed rule

G.I

<sup>1/</sup> The thirteen licensees are: Arkansas Power & Light Company, Carolina Power & Light Company, Duke Power Company, Jersey Central Power & Light Company, Metropolitan Edison Company, Northeast Utilities, Pacific Gas and Electric Company, Pennsylvania Electric Company, South Carolina Electric & Gas Company, Southern California Edison Company, Texas Utilities Electric Company, Virginia Power Company and Yankee Atomic Electric Company.

MAY 15 1985  
Acknowledged by card... *PK*

Mr. Samuel J. Chilk  
May 13, 1985  
Page 2

are quite positive. The Commission recognizes that internal funding is appropriate for utility licensees. Similarly, the proposed rule properly acknowledges the fundamental differences between decommissioning and accident-related decontamination. The proposed rule also eliminates inappropriate and duplicative environmental review requirements, and correctly recognizes that additional plant design requirements and operating procedures to facilitate decommissioning are unnecessary.

G.1  
G.11  
F.1  
C.8

On the other hand, it continues to be UDG's position that a rule addressed to the financial assurance aspects of decommissioning is unnecessary in the case of electric utility licensees, as that term is defined by the Commission's regulations, 10 C.F.R. section 50.2(x) (1984). As UDG explained in the Statement of Position it submitted prior to the Commission's September 20, 1984 public meeting on decommissioning, electric utilities are subject to a comprehensive rate and financial regulatory process which provides reasonable assurance of adequate decommissioning funding. The basis for UDG's position is described in greater detail below.

D.8.1

These comments also focus on additional aspects of the proposed rule which require modification. The principal deficiency is the conclusion that \$100 million will "provide sufficient funds" to cover the costs to decommission "most" power reactors. 50 Fed. Reg. at 5606, Col. 3. The \$100 million figure is based on generic cost studies which depict decommissioning costs in terms of an order of magnitude only, and it can substantially understate the cost to decommission a particular large scale commercial power reactor. Moreover, the practical effect of the \$100 million certification alternative may be to fix that amount as a funding ceiling in rate cases, despite a utility's demonstration in a site-specific cost study that a larger amount is required. That result is plainly contrary to the Commission's objective of assuring adequate decommissioning funding. UDG recommends, therefore, that the \$100 million certification method be eliminated.

D.2.1(a)

UDG also urges the Commission to clarify sections 50.54(cc) and (dd) of the proposed regulation so that changes in an approved funding plan and recordkeeping program cannot be construed as license amendments.

C.7.2

The Commission has also requested additional information and comments on the costs and adequacy of the various funding methods. As explained in greater detail below, the Commission's proposed rule correctly recognizes that the internal reserve method provides reasonable assurance of decommissioning funding and is the least costly method.

D.3.2.1.1(b)

Finally, several aspects of the proposed rule require clarification. These are discussed below.

## II. Discussion

### A. The \$100 Million Certification Alternative Will Be Counterproductive And Should Be Deleted From The Proposed Rule

Under the proposed rule power reactor licensees can provide reasonable assurance of decommissioning funding by submitting either a facility-specific cost estimate or a certification that funding of \$100 million or more (in 1984 dollars) will be provided. UDG opposes the certification alternative. It is similar in effect to imposing a revenue requirement for decommissioning, which is a matter for rate regulatory agencies, rather than this Commission, to determine. Furthermore, the \$100 million certification alternative may be counterproductive in practice because although \$100 million is not sufficient to decommission most power reactors, it has the Commission's imprimatur and may be treated as a cost ceiling in utility rate proceedings.

1. In A Marked Departure From The NRC's Consistent Practice, The Certification Option Purports To Set A Revenue Requirement For Decommissioning, Which Is A Function For Rate Regulators

The Commission's consistent approach to health and safety determinations under the Atomic Energy Act has been to prescribe standards and qualifications that licensees must satisfy in the construction and operation of their facilities. The Commission does not, however, attempt to define the level of cost a licensee will encounter in meeting these standards. This is consistent with sections 271 and 272 of the Atomic Energy Act, 42 U.S.C. §§ 2018 and 2019, which expressly preserve the authority of the various state public service commissions and the Federal Energy Regulatory Commission over the economic and financial aspects of public utility service.

Decommissioning should not be any different. It is neither necessary nor appropriate for the Commission to involve itself in the process of determining the cost to satisfy health and safety standards for decommissioning. In this connection UDG restates its consistent position since the inception of this rulemaking: the comprehensive economic and financial regulation to which investor-owned utilities are

D.2.1(a)

D.8.1  
D.8.3.1

Mr. Samuel J. Chilk  
May 13, 1985  
Page 4

subject provides reasonable assurance of adequate decommissioning financing.<sup>2/</sup> UDG emphasized that position in the presentation on decommissioning financing it made to the Commission this past September.<sup>3/</sup>

The Commission itself recognized the importance of the rate regulatory process in the recent rule eliminating financial qualifications review for public utilities. "Elimination of Review of Financial Qualifications of Electric Utilities in Operating License Review and Hearings for Nuclear Power Plants," 49 Fed. Reg. 35747 (September 12, 1984). Specifically, the Commission noted that:

It is well established that public utility commissions (PUCs) are legally bound to set a utility's rates such that all reasonable costs of serving the public are recovered, assuming prudent management of the utility.

49 Fed. Reg. at 35748, Col. 1. Decommissioning costs clearly represent a reasonable and prudent cost that utilities are entitled to recover, and the vast majority of electric utilities recover the estimated future cost of decommissioning in current rates.<sup>4/</sup> Indeed, the financial qualifications rule

2/ See, e.g., Comments of Arkansas Power & Light Company, et al., October 7, 1977, in Docket No. PRM50-22, pp. 5-7; Comments of Utility Decommissioning Group, July 15, 1978, re Decommissioning Criteria for Nuclear Facilities, Advance Notice of the Proposed Rulemaking, pp. 6-11; Comments of Utility Decommissioning Group, November 6, 1979 re NUREG-0584, Draft Report, Assuring the Availability of Funds for Decommissioning Nuclear Facilities, pp. 2-7, 13-14; Comments of the Utility Decommissioning Group, February 22, 1980, re NUREG-0584, Rev. 1, Draft Report, Assuring the Availability of Funds for Decommissioning Nuclear Facilities, p. 2; Comments of Utility Decommissioning Group, April 22, 1981, re NUREG-0586, Draft Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, p. 2.

3/ See Statement of Position of the Utility Decommissioning Group and the Edison Electric Institute on Proposed Decommissioning Rule, September 14, 1984 (referred to below as "UDG/EEI Statement of Position").

4/ An October 1983 Edison Electric Institute survey of more than 30 investor-owned utilities found that only one state, Michigan, is not presently allowing recovery of decommissioning costs in current rates, and this is due to the fact that the Michigan PSC has deferred recovery of decommissioning (Footnote 4 continued on next page)

D.8.1  
D.8.3.1

Mr. Samuel J. Chilk  
May 13, 1985  
Page 5

refers to a recent National Association of Regulatory Utility Commissioners (NARUC) survey from which NRC Staff concluded that all ratemaking authorities "ensure sufficient utility revenues to meet the costs of NRC safety requirements." 49 Fed. Reg. at 35747, Col. 3. Further emphasizing this point the Commission added:

This question was a subject of particular focus during NRC staff visits to PUCs. The PUCs visited were unanimous in saying that safety-related operating expenses were always considered reasonable expenses when prudently incurred and were allowed to be recovered through rates.

\* \* \*

The Commission believes that the record of this rulemaking demonstrates generically that the rate process assures that funds needed for safe operation will be made available to regulated electric utilities.

D.8.1  
D.8.3.1

Id. at 35750, Cols. 2-3 (emphasis in original).

Against this background it is simply not correct to suggest that without the proposed decommissioning regulations utilities lack an incentive to make advance provision for decommissioning funding. See 50 Fed. Reg. at 5611, Col. 1 (Separate Views of Commissioner Bernthal). On the contrary, as noted above, the vast majority of electric utilities recover decommissioning costs in their rates despite the absence of any NRC-imposed requirement. The incentive to collect these funds is the rate regulatory process and the principle that those who benefit from a generating facility should bear the corresponding costs.

In view of these facts UDG repeats a position that it has advocated in this proceeding since 1979. The Commission can satisfy its financial assurance objectives by requiring a certification by the appropriate rate regulatory agency (or

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(Footnote 4 continued from previous page)  
costs pending the outcome of a generic proceeding. Similarly, government-owned utilities include decommissioning costs in their rates as well. See UDG/EEI Statement of Position, September 14, 1984, at 5; see also the transcript of the Commission's September 20, 1984 open meeting on decommissioning at Tr. 39.

Mr. Samuel J. Chilk  
May 13, 1985  
Page 6

agencies) that pursuant to state (or federal) law it regulates a given licensee's revenue requirements and rates. Obviously, a premise for this type of certification is that the rate-making agency will be faithful to its statutory mandate to allow recovery of all prudent expenditures. That premise underlies the Commission's action in the financial qualifications rulemaking and it applies with equal -- if not greater -- force to decommissioning.<sup>5/</sup>

In sum, the specification of a decommissioning funding requirement, such as the \$100 million certification, transcends the Commission's authority and is unnecessary in connection with assuring adequate funds for decommissioning.

2. Contrary To The Commission, \$100 Million Is Not "Sufficient" Decommissioning Funding For "Most" Power Reactors, But As A Consequence Of The Proposed Rule May Become A Ceiling

a. For Most Reactors \$100 Million Is Not Sufficient Funding. The Statement of Considerations describes the \$100 million certification amount as "sufficient funds to cover decommissioning costs for most" power reactor licensees. 50 Fed. Reg. at 5606, Col. 3 (emphasis supplied). The Battelle studies, NUREG/CR-0130 and NUREG/CR-0672, are cited as support for that statement. The Battelle studies do not, however, support the Commission's conclusion regarding the adequacy of the \$100 million amount, nor does it have any other factual basis.

To begin, the Battelle studies were never intended to be used as a basis for estimating the decommissioning cost for a given reactor. Instead, they were intended to identify decommissioning costs in terms of an order of magnitude only. Indeed, due to their generic nature the Battelle studies do not take into account the numerous bases by which estimated decommissioning costs necessarily vary among individual power plants. This includes, among other things, plant design, decommissioning methods, waste disposal costs and regional differences in labor and transportation costs. These factors can account for differences of many millions of dollars in the

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<sup>5/</sup> While rate regulators always allow recovery of safety related expenses, 49 Fed. Reg. at 35750, Col. 2, their rate case decisions usually do not discuss these expenses. Decommissioning is an exception. Rate regulators are focusing very directly on the need to recover decommissioning expense in current rates.

D.8.1  
D.8.3.1

D.1.1.1  
D.2.1(a)

Mr. Samuel J. Chilk  
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estimated decommissioning cost of similarly-sized power reactors.<sup>6/</sup>

The Battelle studies expressly acknowledge their inherent limitations. For example, the studies note that they are based on a specific set of assumptions and that to apply the same results "where conditions are different from those assumed in th[ese] stud[ies] could produce erroneous conclusions." NUREG/CR-0130, Vol. 1, June 1978, at 2-4. In particular, the Battelle studies emphasize the importance of a site specific study of decommissioning costs:

[T]o develop a realistic estimate of the costs of decommissioning a reactor facility, it is necessary to perform a quite detailed analysis of the specific plant under consideration. Design differences among plants can have significant impacts on the types and amount of work involved in accomplishing decommissioning. Until such time as facility designs are truly standardized, these plant-specific analyses will be necessary.

D.1.1.1  
D.2.1(a)

Id. at 12-9 (emphasis supplied).

Further underscoring this same point, R. I. Smith, a principal author and coordinator of the Battelle studies has stated:

The analyses in the Addendum [to NUREG/CR-0130] were intended to provide order of magnitude estimates, good to within a factor of two certainly, but not intended to be used without further site-specific analysis. We did not attempt to deal with any of the site-specific considerations peculiar to each of the stations examined.

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<sup>6/</sup> The Battelle studies examine decommissioning cost estimates for several pressurized water reactors (PWRs) of varying size and develop ratios or "scaling factors" for different categories of decommissioning cost which depict the costs as a function of plant size. NUREG/CR-0130 Addendum, August 1979, at 3-1. Subsequent studies indicate that there is no clear relationship between plant capacity and decommissioning costs. See Analysis of Nuclear Power Reactor Decommissioning Costs, National Environmental Studies Project, Atomic Industrial Forum, AIF/NESP 021SR, May, 1981, at 3.

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Thus, while those costs derived from the component analyses are reasonably reliable, you should do your own examination of the rest of the cost elements, some of which may be very site-dependent.<sup>7/</sup>

In other words, estimating decommissioning costs involves many variables which the generalized approach of the Battelle studies does not consider, but which are addressed in site-specific studies. Significantly, the 1983 EEI survey referred to earlier indicates that 76 percent of the utilities surveyed use site-specific studies to determine decommissioning costs.

It is not surprising that a number of studies refute the proposition that \$100 million is sufficient for most power reactors. For example, a December 1984 report that Battelle prepared for the Electric Power Research Institute (EPRI) updates the earlier Battelle studies to reflect 1984 costs.<sup>8/</sup> Under the updated study the estimated immediate dismantlement cost for a BWR is approximately \$120 million.<sup>9/</sup> Moreover, an EPRI analysis of decommissioning issued at the same time as the Battelle update includes site specific decommissioning estimates for reactors comparable in size to the reference reactor in the Battelle study. The site specific estimates are \$133.6 million for an 1100 MWe BWR and \$126.2 million for

D.1.1.1  
D.2.1(a)

<sup>7/</sup> Letter from R.I. Smith, Battelle Pacific Northwest Laboratories, to H. R. Prins, Nuclear Power Generation Planner, Power Division, State of New York, Department of Public Service, dated October 29, 1982 (emphasis added).

The Statement of Considerations suggests that "[t]he PNL [Battelle] decommissioning studies can be used for initial estimates with suitable adjustments for inflation and site specific factors." 50 Fed. Reg. at 5604, Col. 3. As shown above, the Battelle studies are intended to indicate decommissioning costs only in terms of an order of magnitude. The Battelle studies are not an appropriate basis for developing cost estimates for individual plants and the statement quoted above should be deleted or clarified.

<sup>8/</sup> R. I. Smith, et al., "Costs for Decommissioning Nuclear Power Facilities Estimated in 1984 Dollars," prepared by Battelle Pacific Northwest Laboratories for Electric Power Research Institute, December 1984.

<sup>9/</sup> Id. at Table 1.1. The \$120 million estimate assumes contractor staffing for various labor functions and the 5 rem annual cumulative radiation dose rate. If a more stringent dose rate were applied, the estimate would be higher.

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an 1100 MWe PWR (each of these amounts is exclusive of demolition costs for non-radioactive structures).<sup>10/</sup>

Additional examples of recent site specific estimates covering various regions of the United States further confirm that the \$100 million certification amount is too low:

Capacity (MWe)	Reactor Type	Date of Study	Removal Cost:		
			Radioactive	Nonradio- active	
				Total	
1000	BWR	3/85	\$115,373,000	\$ 52,028,000	\$167,401,000
940	BWR	3/85	117,618,000	43,507,000	161,125,000
610	BWR	3/85	111,946,000	30,763,000	142,709,000
1150	PWR	5/85	100,510,000	34,330,000	135,253,000

D.1.1.1  
D.2.1(a)

It should be emphasized that these four site specific cost studies are shown without the addition of a contingency allowance. UDG understands that the Commission's \$100 million amount, on the other hand, does include a 25 percent contingency. The addition of a 25 percent contingency to these cost studies would further underscore the inadequacy of the Commission's cost figure. <sup>11/</sup>

In sum, the Commission's \$100 million Battelle-derived certification amount is not sufficient to decommission the

<sup>10/</sup> J. T. A. Roberts, et al., "Decommissioning of Commercial Nuclear Power Plants," prepared by Electric Power Research Institute, December 1984.

<sup>11/</sup> The source of the data shown above is TLG Engineering, Brookfield, Connecticut. Because of their recent origin the underlying cost studies have not been officially filed with rate regulatory agencies. Until that has been done, the licensees involved have asked that the names of the plants not be listed.

These cost studies were prepared in accordance with the cost estimation methodology that has now been published as "Guidelines For Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP (National Environmental Studies Project), Draft Report, March 1985. The object of the NESP guidelines is to reduce reliance on generic studies and minimize obsolescence so that cost estimates can be updated periodically without redoing substantially the entire estimate. The task force overseeing this effort includes representatives from the NRC, NARUC and utility licensees.

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large scale commercial power reactors that have gone into service in recent years. While the Statement of Considerations notes that the regulation can be modified in the future if costs change significantly, 50 Fed. Reg. at 5606, Col. 3, it has been shown here that the \$100 million certification is already obsolete. The solution is to eliminate the certification method and rely instead on site specific cost studies, updated at appropriate intervals as costs change.

b. The \$100 Million Certification Option Could Be Counterproductive And Undermine Adequate Funding.<sup>12/</sup> Finally, while the rationale for certification appears to be the commendable objective of minimizing administrative effort for licensees and the Commission, 50 Fed. Reg. at 5606, Col. 3, certification will not reduce administrative burdens and could be counterproductive. Thus, although funding decommissioning is not in relative terms a major expense to electric utilities, in absolute terms it represents a considerable cost for which rate regulators require substantiation. That means utilities typically prepare site-specific cost studies for rate cases regardless of the certification procedure. This substantially undercuts the purpose of certification as it relates to regulated public utilities.

D.2.1(a)

Furthermore, particularly troubling is the fact that although \$100 million usually understates decommissioning costs, logic suggests that that amount would be at the high end of the cost spectrum. There is concern, therefore, that rate regulators, fully aware of the NRC's concern for adequate decommissioning funding, will reject estimates which lead to the conclusion that the Commission chose a number that would be insufficient in many cases. In this connection it should also be noted that utility rate case intervenors, who often advocate positions that will lower rates for present consumers at the expense of future ones, can be expected to argue that \$100 million is necessarily sufficient funding. Taken together, these factors can lead to rate case decisions that defer to the future the recovery of costs -- either decommissioning or other types of costs -- that are properly the responsibility of current consumers.

These considerations strongly suggest that the \$100 million certification amount, having the Commission's stamp of approval, could become a presumption or cost ceiling in utility rate proceedings. A utility with a site-specific estimate greater than \$100 million will have the very difficult burden

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<sup>12/</sup> The concerns discussed here are not intended to apply in the case of a government-owned utility licensee that has authority to set its own rates.

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of proving why the funding level that the NRC said is sufficient for most reactors is nevertheless inadequate. This clearly undermines a fundamental objective of the Commission's decommissioning rule -- assuring adequate decommissioning funding.<sup>13/</sup>

For these reasons, the certification option should be deleted from the proposed rule. Instead, the rule should rely on site-specific studies.

3. If Certification Is Not Eliminated, The Certification Amount Should Be Increased And Its Purpose Clarified

If the certification option is not deleted from the proposed rule, the certification amount should be increased. As shown above, \$100 million is not adequate to cover the cost of decommissioning a large scale power reactor. Therefore, in order to avoid the consequences that may result from a certification amount that is too low (see *supra*, pp. 6-11), the certification amount should be increased substantially, to the \$120 million to \$170 million range.

In addition, the purpose of certification must be clarified because that purpose is obscured by the different phrasing of the text of the proposed regulations and the Statement of Considerations. Thus, while proposed section 50.33(k)(1) describes \$100 million as a threshold or minimum amount (funding assurance "in an amount at least equal to \$100,000,000"), the Statement of Considerations nevertheless says that \$100 million is "sufficient" to decommission "most" reactors. 50 Fed. Reg. at 5606, Col. 3. The Commission should specifically withdraw the latter statement. It is incorrect and inconsistent with the intent of proposed section 50.33(k)(1). The rule should make clear that the certification amount is not intended to and does not represent the actual cost to decommission any reactor.

In addition, the Commission should clarify that the certification amount, whether it is \$100 million or a higher figure, is intended to cover removal and waste disposal costs for

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<sup>13/</sup> One additional shortcoming of the certification option should be noted here as well. To use this method a utility must submit an open-ended certification that the requisite amount will be "adjusted annually for inflation using an inflation rate twice that indicated by the change in the Consumer Price Index." Proposed § 50.33(k)(1). A utility licensee cannot, however, certify to the future actions of rate regulators.

D2.1(a)

D.2.1(b)

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radioactive plant components and structures only. This is clearly the Commission's intent, see 50 Fed. Reg. at 5606, Col. 3, but rate regulators may overlook the distinction between removing radioactivity and demolition of nonradioactive structures. The proposed rule should clarify that distinction.

D.2.1(b)

Finally, the inflation adjustment of twice the Consumer Price Index is factually unsound and may cause the same problems in rate proceedings as the \$100 million certification. Major elements of decommissioning cost have increased in recent years at a rate not just twice, but more than four times, the rate of increase in the Consumer Price Index.<sup>14/</sup> Furthermore, like the \$100 million certification amount, the twice-CPI inflation adjustment may be treated as a presumption in rate proceedings. If retained in the Commission's final rule, it should be made clear that the adjustment is a minimum and is not intended to reflect the actual rate of increase in decommissioning costs.

D.2.1(a)

D.2.1(b)

**B. Decommissioning Regulations Should Not Be Imposed As License Conditions**

The proposed requirements on decommissioning funding plans and recordkeeping would be imposed as conditions of operating licenses. Proposed § 50.54(cc).<sup>15/</sup> UDG is concerned that if these requirements are imposed as conditions of operating licenses under section 50.54, then, for example, a licensee's

C.7.2

D.4.4

<sup>14/</sup> For example, the December 1984 EPRI/Battelle study referred to above indicates that waste disposal costs (containers, transportation and burial) over the period January 1978 to January 1984 increased from \$8.61 million to \$22.96 million for PWRs, an increase of 267%, and from \$8.68 million to \$23.38 million for BWRs, a 269% increase. Id. at Tables A.1 and A.3. During the same period the basic Consumer Price Index rose from 187.2 to 305.2, an increase of 63.03%. Thus, the increase in waste disposal costs was more than four times the CPI increase.

<sup>15/</sup> The submission of a financing plan would be required of "each holder of an operating license for a production and utilization facility. . . ." Proposed § 50.54(cc)(2). In the case of multiple ownership of a facility or where the entity licensed to operate the facility is not an owner, UDG understands that the funding plan will be filed by the lead licensee and that the plan will describe the funding mechanism to be used by each co-owner for its share of decommissioning costs.

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change to an approved funding plan could be construed (erroneously we believe) as a license amendment. That would trigger the notice and hearing procedures of section 189 of the Atomic Energy Act, 42 U.S.C. § 2239, despite the fact that the requirements in question have no direct impact on the safe operation of a power plant.

It is UDG's understanding, however, that the Commission does not intend that a change in an approved funding plan or a recordkeeping system will constitute a license amendment. In the description of the periodic review requirements in the Statement of Considerations the Commission indicates that routine adjustments for changes in inflation and interest rates may be made annually through entries in the licensee's annual financial report, and "[a] technical review of the information in the preliminary plans or the cost estimate for a funding plan could be done less frequently and submitted to NRC for approval." 50 Fed. Reg. at 5608, Col. 2 (emphasis added). There is no suggestion that a license amendment is required to effect such changes.

Indeed, most changes to a funding plan over the years can be expected to increase the level of funding, as the Commission's discussion of periodic review appears to contemplate. In such cases, the formal hearing procedures associated with license amendments would not be appropriate since no party would be adversely affected by such a change. See Bellotti v. NRC, 725 F.2d 1390 (D.C. Cir. 1983) (hearing is required under section 189(a) of the Act only where requested by a party whose interest would be adversely affected by the action). Accordingly, in order to eliminate any confusion over whether formal license amendment procedures will be necessary, UDG urges the Commission to make clear in the final rule that a licensee's changes to a funding plan and recordkeeping program do not constitute license amendments.

The best approach on this point, however, would be for the Commission not to impose the funding and recordkeeping requirements as license conditions under section 50.54, but instead to impose such requirements by regulation. Procedural difficulties can arise where the Commission seeks to modify a requirement that has been established as a license condition. See, e.g., Union of Concerned Scientists v. NRC, 711 F.2d 370 (D.C. Cir. 1983) (compliance deadline for environmental qualification could not be lifted by rule without notice and opportunity for comment).<sup>16/</sup> Furthermore, imposing the

<sup>16/</sup> Under the Commission's recent rule on the "good cause" exception to the notice and comment requirements of § 553 of the Administrative Procedure Act, 50 Fed. Reg. 13006 (April 2, (Footnote 16 continued on next page)

C.7.2

D4.4

C.7.2

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requirements by regulation rather than license condition would not in any way reduce the Commission's authority to take appropriate enforcement action against a licensee. The Commission's enforcement authority under sections 186 and 234 of the Act, 42 U.S.C. §§ 2236 and 2282, is the same regardless of whether a violation of a regulation or a license condition is involved. For these reasons, UDG urges the Commission to revise the proposed regulation so that funding and recordkeeping requirements will not be imposed as license conditions.

C.7.2  
D.4.4

C. The Proposed Rule Correctly Concludes That The Internal Reserve Provides Reasonable Assurance Of Adequate Decommissioning Funding

The Commission has requested additional comments and information on the costs and adequacy of assurance of the various funding methods. 50 Fed. Reg. at 5609, Col. 1.

1. The Relative Costs Of Funding Alternatives

The relative costs of the various funding methods have been the subject of considerable analysis. See, e.g., NUREG-0584, Rev. 3 at 13-30. The generally accepted estimate is that the cost of external sinking funds and prepayment is approximately 2 to 3 times, respectively, the cost of the internal reserve. That estimate is adopted by the Regulatory Analysis underlying the proposed rule (at page 15).

D.3.2.1.1(b)

UDG agrees that the relative costs of the funding methods are in this order of magnitude. In that connection UDG has previously submitted to the Commission cost studies which support these cost comparisons (the UDG cost studies are cited in NUREG-0584, Rev. 3 at 13, 29).<sup>17/</sup>

(Footnote 16 continued from previous page) 1985), the "good cause" exception is not available for rules that specifically amend reactor licenses. Thus, changes the Commission seeks to make in the funding and recordkeeping requirements, however minor, may require prior notice and opportunity for comment.

<sup>17/</sup> See Comments of Utility Decommissioning Group, February 22, 1980 re NUREG-0584, Rev. 1. The internal reserve method is least costly for consumers because rate regulators reduce by the amount of the decommissioning reserve the rate base on which a utility's rate of return is computed. See NUREG-0584, Rev. 3 at 9.

(Footnote 17 continued on next page)

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2. The Assurance Provided By  
Alternative Funding Methods

The funding assurance provided by the various methods has also been the subject of exhaustive analysis. See, e.g., NUREG-0584, Rev. 3, at 11-13, 47-49; NUREG/CR-3899. The proposed rule properly recognizes that the internal reserve method provides reasonable assurance and is appropriate for multi-asset utilities.<sup>18/</sup> The internal reserve is also favored by most ratemaking agencies (the October 1983 Edison Electric Institute survey referred to earlier shows that two-thirds of the utilities surveyed use an internal reserve). The conclusion that the internal reserve provides reasonable assurance is clearly appropriate for several basic reasons.

First, as the Commission expressly recognizes, previous concern over the possibility of premature decommissioning has been alleviated by the requirement for on-site property damage insurance. See 50 Fed. Reg. at 5608, Col. 1. The substantial amount of property insurance required by 10 C.F.R. section

D.3.2.1.1(b)

D.3.2.1.2

D.3.2.1.1(b)

D.3.2.2.1

(Footnote 17 continued from previous page)

The Statement of Considerations seems to assume that a utility that has used an internal reserve will necessarily issue bonds in the later years when the cash outlays for decommissioning arise. 50 Fed. Reg. at 5607, Col. 2. While issuing bonds is one means of raising the necessary cash for decommissioning, some utilities, especially large utilities, may use the normal cash flow from operations for that purpose. This is particularly true in view of the fact that these cash requirements will be spread out over a period of several years. The Statement of Considerations and proposed regulation, § 50.33(k)(2)(iv), should be clarified accordingly.

<sup>18/</sup> Proposed § 50.33(k)(4)(iv) would allow the use of an internal reserve by "an electric utility owning more than one generating facility. . . ." UDG understands this to mean "owning a comparable interest in, or a comparable entitlement to the output of, another operable generating facility." It should not be necessary for a utility to own another generating facility outright in order to be considered a multi-asset utility for purposes of the decommissioning rule. UDG urges the Commission to clarify this point in the final rule. In this regard, it may be best to phrase § 50.33(k)(4)(iv) in the negative, since the Commission's intent is to proscribe the use of an internal fund by single-asset utilities. Thus, the subsection could read: "Except in the case of an electric utility owning an interest in only one generating facility, an internal reserve in which deposits are made at least annually. . . ."

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50.54(w) ensures that even in the highly improbable event of accident-related, premature decommissioning, the utility will still have sufficient resources available after the decontamination process to carry out decommissioning.

D.3.2.2.1

Second, as Professor Siegel concluded in his September 1984 study, NUREG/CR-3899, electric utilities have sufficient financial capability to cover the costs of decommissioning. The foundation of that capability is the comprehensive financial and economic regulatory process which provides for on-going recovery by utilities of their estimated decommissioning costs as well as all other prudently incurred costs. See supra, pp. 3-6. Based on these considerations as well as others the Commission's Staff and consultant, Professor Siegel, have each concluded that the internal reserve meets the reasonable assurance standard and, in Professor Siegel's words, "provides excellent assurance of the availability of funds" for decommissioning. NUREG-0584, Rev. 3 at 49; NUREG/CR-3899 at 13.

D.3.2.1.1(b)

Two concepts appear to underlie the assurance-based ranking of funding mechanisms in the Statement of Considerations. These are (1) the size of the fund at a given point in time relative to the current decommissioning cost estimate and (2) the financial position of the entity that holds the fund. 50 Fed. Reg. at 5606, Col. 2. Applying these criteria, the proposed rule recognizes that the internal reserve provides reasonable assurance. Id. at 5608, Col. 1. But it is also suggested that the internal reserve provides lesser assurance than the external prepaid and sinking fund methods. Id. at 5607, Col. 3 to 5608, Col. 1. That suggestion fails to address several important facts.

First, the Statement of Considerations indicates that the external prepaid method provides the greatest assurance because the entire amount required is deposited at startup. Id. at 5607, Col. 3. Internal funding methods can take several forms, however, and one form, straight line depreciation, provides a pattern of collections in which the size of the decommissioning reserve is almost always larger than the prepaid account balance.<sup>19/</sup>

D.3.2.1.2

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<sup>19/</sup> The reason for this is that under straight line depreciation the cost inflation that is expected to occur during the license term is accounted for in the initial decommissioning cost estimate by anticipating the price levels that will be encountered when decommissioning takes place many years later. That inflation-adjusted amount is recovered ratably over the license term and credited to an internal reserve account.

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Furthermore, the fact that internal funds are held by the utility rather than an independent financial institution does not detract from the excellent assurance that internal funding provides or increase vulnerability relative to other methods. See 50 Fed. Reg. at 5609, Col. 1. In fact, in contrast to other methods, the internal reserve improves the utility's financial integrity. This is because the internal reserve may be used to purchase utility assets or reduce debt from utility operations, id., which enhances the utility's ability to generate funds internally and reduce external financing. The capital markets recognize these benefits and they are reflected in the cost of the securities the utility issues.

Moreover, like any investment, external funding methods are subject to risk, including the soundness and fluctuation in market value of the securities in which an external fund is invested and the financial condition of the entity that holds the fund. Thus, regardless of the funding method used, the utility must stand behind the fund. Indeed, the internal and external sinking fund methods are each designed to recover estimated decommissioning costs over a plant's projected operating life -- a period of many years. Therefore, the key to funding assurance under either method is the long-term financial viability of the utility and its ability to operate efficiently and obtain compensatory rates.

In sum, the standard that governs the Commission's evaluation of alternative funding methods is "reasonable assurance," as the Statement of Considerations recognizes, 50 Fed. Reg. at 5606, Col. 1, and the choice between alternative funding methods meeting that standard is for state and federal rate regulators to make, with due regard for the circumstances in individual cases.<sup>20/</sup> Because the internal reserve method provides reasonable funding assurance, it is appropriate for use by utility licensees.<sup>21/</sup>

<sup>20/</sup> The Commission has previously noted the state commissions' position that "particular funding arrangements, such as funded reserves, escrow accounts, depreciation allowances, etc., should be left to the state commissions in view of their legal responsibilities under state laws and the specific needs of individual states." See Response to and Partial Denial of Petition for Rulemaking Filed by the Public Interest Research Group, et al., 44 Fed. Reg. 36523, 36525, Col. 1 (1979).

<sup>21/</sup> UDG recognizes that for single-asset utilities -- i.e., those owning an interest in only one generating facility -- the use of an internal funding method may not be appropriate. Several single-asset utilities have voluntarily chosen to use an external sinking fund, and the Federal Energy Regulatory (Footnote 21 continued on next page)

D.3.2.1.1(b)

D.8.3.1

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### 3. The Possibility of Insolvency

Commissioners Asselstine and Bernthal have also requested comments on the need to consider the possibility of insolvency and its impact on the continued availability of decommissioning funds. At the outset it should be emphasized that the possibility of an electric utility becoming insolvent is extremely remote. No electric utility has gone bankrupt since 1931.

The Commission retained Professor Siegel, an expert in utility finance, to examine, among other things, this precise question, i.e., the impact of utility financial instability or bankruptcy on the availability of decommissioning funds. Professor Siegel investigated several utilities experiencing various stages of financial stress due to the large expense of ongoing nuclear plant construction programs. He concluded that

there is sufficient value in on-going utilities, even those experiencing severe financial stress in bringing completed or nearly-completed nuclear reactors on line, to more than cover the decommissioning costs.

NUREG/CR-3899 at 10. In line with that assessment, the Commission's proposed rule recognizes that "[e]ven financially troubled utilities have sufficient assets to cover the costs of decommissioning." 50 Fed. Reg. at 5608, Col. 2. UDG agrees with these conclusions of Professor Siegel and the Commission.

Furthermore, even in the unlikely event of an insolvency, the obligation to decommission and the financial means to do so will be available. Thus, as Professor Siegel notes in his report, a financially impaired company's assets have far

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(Footnote 21 continued from previous page)  
Commission has followed a policy of requiring that method for single-asset utilities.

UDG also believes that government-owned utility licensees should be permitted to provide financial assurance through a "certification that the appropriate government entity will be guarantor of decommissioning funds." See proposed § 50.33(k)(3)(iv). Under the proposed rule that method is available to other types of government-owned licensees, and the proposed rule provides no basis for different treatment of government-owned utilities.

D.3.2.1.1(b)

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greater value if the firm remains in operation, and it is rarely in the interest of creditors, therefore, to close a firm and sell its assets. NUREG/CR-3899 at 4. This is particularly true in the case of electric utilities because they provide an essential public service. Moreover, the utility -- or successor entity if there is a reorganization -- will retain the obligation to decommission and will have the cash flow from operations to fund and complete decommissioning properly.<sup>22/</sup>

D.3.2.1.1(b)

D. Several Aspects of the Proposed Rule Require Clarification

Finally, several additional points raised in the proposed rule require clarification.

1. Funding Method And Use Of SAFSTOR

It appears from the language of proposed section 50.82(c) that where SAFSTOR is selected as the decommissioning alternative the decommissioning fund is to be placed in an external account unless assurance is being provided by a surety, insurance, or the certification method. See 50 Fed. Reg. at 5608, Col. 3.<sup>23/</sup> UDG understands this provision to mean that where a utility that has previously used internal funding commences SAFSTOR and continues as an on-going multi-asset utility during the SAFSTOR period, the utility should not be required to shift to external funding as long as it continues to provide satisfactory assurance of the requisite level of decommissioning funding.

D.3.4

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<sup>22/</sup> Another point that Professor Siegel addresses should be noted here as well. Specifically, it is important to recognize that the financial difficulty associated with construction of nuclear power plants is in substantial part a result of prolonged licensing delays. See NUREG/CR-3899 at 2-3. Such concerns are not pertinent to decommissioning where the focus is on a utility that has successfully completed construction and the plant is in commercial operation.

<sup>23/</sup> There appears, however, to be an inconsistency in the Statement of Considerations on this point. At 50 Fed. Reg. 5603, Col. 1, this process is described with no mention of the certification method. The language of the regulation itself, of course, will control over the Statement of Considerations; however, UDG urges the Commission to correct the inconsistency in the Statement of Considerations.

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This is an appropriate provision as far as it goes and should be retained regardless of any changes the Commission may make in connection with the certification option as it relates to regulated public utilities. See *supra*, pp. 3-12. However, the language of section 50.82(c), as proposed, would require a fund certification "in accordance with the criteria of § 50.33(k)" -- that is to say, a certification in an amount of at least \$100 million adjusted for inflation. If the cost estimate for a small plant is less than that amount, the utility would not be able to make such a certification and would have to convert to an external reserve should it elect the SAFSTOR option.<sup>24/</sup> There is no reason to require plants with decommissioning reserves below \$100 million to convert, *ipso facto*, to an external fund so long as they can continue to demonstrate reasonable assurance using an internal fund. UDG therefore urges the Commission to modify proposed section 50.82(c) so that the use of internal funding during SAFSTOR is not contingent on a specific level of funding assurance.

D.3.4

## 2. Definition of Decommissioning

Proposed Section 50.2(y) defines decommissioning as removing a facility "safely from service and reduc[ing] residual radioactivity to a level that permits release of the property for unrestricted use and termination of license." UDG understands this definition to encompass (1) decontamination of radioactive structures, systems and components and (2) removal of those structures, systems and components that cannot be decontaminated to acceptable levels. We further understand that the \$100 million certification amount contained in the proposed rule is based on this definition and does not include the cost of site restoration or demolition of non-radioactive structures. 50 Fed. Reg. at 5606, Col. 3.

B.1.2.1

At an earlier point, however, the Statement of Considerations suggests that decommissioning means to remove "nuclear facilities" from service, including "the site, buildings and contents, and equipment associated with any NRC licensed activity." 50 Fed. Reg. at 5600, Col. 3. This statement is much too broad; the removal of all buildings and equipment associated with NRC licensed activities at the site is not within the generally understood scope of decommissioning and contradicts proposed Section 50.2(y). The statement should be deleted from the Statement of Considerations or clarified. This is necessary to avoid confusion over the cost elements to which the proposed financial assurance requirements apply.

<sup>24/</sup> Alternatively, the utility would be required to purchase decommissioning insurance or a surety bond, even though previously it had not been necessary to do so.

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### 3. Decommissioning Activities

Proposed section 50.82(e) would require Commission authorization for decommissioning. The Statement of Considerations clarifies that requirement: "Decommissioning plans should be submitted in a timely way for review and approval prior to the initiation of any major decommissioning activity." 50 Fed. Reg. at 5605, Col. 2 (emphasis added). It is UDG's understanding that prior Commission approval under proposed section 50.82(e) will not be necessary for those decommissioning activities which can be accomplished in accordance with the current regulations, 10 C.F.R. section 50.59. For example, after fuel has been removed from the core, the licensee should be able, on the basis of an analysis performed under section 50.59, to dismantle certain systems and equipment that the Technical Specifications do not require to remain operable. Such activities can facilitate the decommissioning process and should be allowed consistent with section 50.59.

C.1.5

### 4. The Timing of New Regulations

It is UDG's understanding that the Commission does not intend that operating license applications currently on file must be amended to provide the financial assurance information described in proposed section 50.33. The Statement of Considerations, 50 Fed. Reg. at 5601, Col. 3, appears to contemplate that such information will be required only in connection with applications for new licenses which are filed after the regulations have become effective. UDG urges the Commission to make clear that the revisions to section 50.33 concerning financial assurance for decommissioning are meant to apply to applications for operating licenses filed after the effective date of the rule, and not to applications currently under review.

D.4.1.2

Finally, the proposed regulations on financial assurance will become operative two years after the effective date of the rule. Proposed § 50.54(cc). The Commission is also planning to issue a regulatory guide on financial assurance. 50 Fed. Reg. at 5603, Col. 1. Licensees should have the benefit of the regulatory guide during the two-year period that they must prepare to satisfy the new regulations. If there is delay in issuing the final regulatory guide on financial assurance, then the operative date of the new regulations should be deferred accordingly.

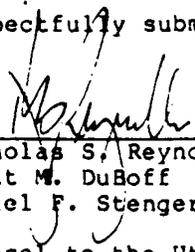
D.4.1.1

Mr. Samuel J. Chilk  
May 13, 1985  
Page 22

III. CONCLUSION

The Utility Decommissioning Group respectfully requests that the Commission's proposed rule on Decommissioning Criteria for Nuclear Facilities be modified as discussed in these comments.

Respectfully submitted,

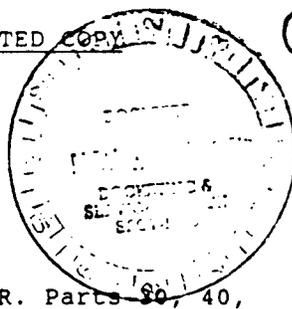
  
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Nicholas S. Reynolds  
Scott M. DuBoff  
Daniel F. Stenger

Counsel to the Utility  
Decommissioning Group

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UNITED STATES OF AMERICA  
BEFORE THE  
NUCLEAR REGULATORY COMMISSION



In the Matter of )  
)  
)  
Decommissioning Criteria for ) 10 C.F.R. Parts 30, 40,  
Nuclear Facilities, Proposed Rule ) 50, 51, 70 and 72

COMMENTS OF  
CERTAIN PUBLICLY-OWNED ELECTRIC SYSTEMS  
AND PUBLIC POWER AGENCIES  
OPPOSING, IN PART, ADOPTION OF PROPOSED RULES  
ON DECOMMISSIONING

On February 5, 1985, the Nuclear Regulatory Commission issued a Notice of Proposed Rulemaking for Decommissioning Criteria for Nuclear Facilities, 50 Fed. Reg. 5600 (1985). The NRC proposed rules (1) relating to the amount to be collected for decommissioning; (2) discussing funding methods which may be used; (3) describing procedures which can be used to decommission plants; (4) establishing recordkeeping requirements related to decommissioning planning; and (5) establishing administrative procedures to be followed at the time decommissioning actually commences.

The comments which follow primarily address the NRC's proposed rules concerning the amount to be collected for decommissioning and the methods which may be used to fund decommissioning, as those rules affect electric utilities. 1/

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1/ Part 50 of the Proposed Rules sets forth the relevant regulations.

While there is a public interest in assuring that funds will be available for decommissioning, as shown below, that interest will not be served by the proposed rules which are the subject of these comments. Indeed, there is a strong likelihood that the rule, as proposed, would significantly unbalance the relationship of actual costs and the rates likely to be allowed. This will send the wrong signals to the affected customers of the utility/licenseses and could well result in both overcollections and undercollections. Neither of these results are desirable public goals.

D. 8.1

BACKGROUND AND SUMMARY OF COMMENTS

These comments are being filed on behalf of the Cities of Anaheim and Riverside, California, Board of Public Works - Marshall Missouri Municipal Utilities, Ashburnham Municipal Light, Templeton Municipal Lighting Plant, Boylston Municipal Light Department, Braintree Electric Light Department, Chicopee Municipal Light Plant, Danvers Electric Division, Georgetown Municipal Light Department, Groveland Municipal Light Department, Hudson Light & Power Department, Hingham Municipal Light Plant, Gas & Electric Department, Hudson Light & Power Department, Hull Municipal Light, Ipswich Municipal Electric Department, Littleton Light & Water, Marblehead Municipal Light Department, Merrimac Municipal Light Plant, Middleborough Gas & Electric Department, Middleton Municipal Light Department, North Attleboro Electric Department, Paxton Electric Light Department,

Peabody Municipal Light Plant, Shrewsbury Electric Light Plant, Electric Light Department of South Hadley, Sterling Municipal Electric Light Department, Taunton Municipal Lighting Plant, Municipal Electric Light Department, West Boylston Municipal Lighting Plant, Westfield Gas & Electric Light Department, Virginia Municipal Electric Association; 2/ Florida Cities Public Power Committee; 3/ North Carolina Municipal Power Agency No. 1 ("NCMPA"); North Carolina Eastern Municipal Power Agency (NCEMPA"); and the Connecticut Municipal Electric Energy Cooperative, Inc. ("CMEEC"), collectively referred to herein as "Public Systems."

The entities joining in these comments are either publicly owned electric systems, or public power agencies which provide wholesale power to municipally owned electric systems. Certain of the commenters are wholesale customers of utilities that own nuclear generation and whose wholesale rates include costs associated with decommissioning such nuclear generation. Other commenters are customers of utilities which own nuclear generation and also are co-owners and/or co-licensees of nuclear units. The power agencies, NCMPA, NCEMPA and CMEEC, provide

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2/ VMEA represents the Towns of Blackstone, Culpeper, Elkton, and Wakefield, Virginia; the Cities of Franklin and Manassas, Virginia, and the Harrisonburg Electric Commission in wholesale rate proceedings involving the Virginia Electric and Power Company.

3/ Composed of a number of Florida Cities which are customers of Florida Power Corporation, or co-owners and/or co-licensees of Florida Power Corporation's Crystal River units.

power to participating municipal utilities. Each agency owns an interest in nuclear capacity. Each agency (under varying arrangements) also purchases additional capacity from investor-owned utilities, the cost of which is affected by estimated decommissioning costs. Thus, Public Systems represent the interests of wholesale purchasers of electric power and owners of nuclear capacity.

Public Systems do not object to paying their appropriate share of decommissioning expense and indeed, are presently paying (as power purchasers) and collecting (as owners) amounts for decommissioning. However, the proposed rules relating to decommissioning costs and funding methodologies are likely to result in additional confusion and potential miscollection of decommissioning funds and to that Public Systems do object.

Specifically,

- o The cornerstone of the proposed NRC decommissioning rules -- a \$100 million decommissioning cost estimate to be annually escalated at two times the CPI -- is not a reasonable across-the-board proxy for specific decommissioning costs;
- o It is not clear that the NRC has considered or devised efficient and fair procedures for handling challenges to utility decommissioning cost estimates and funding plans; yet efficient and fair handling of such challenges may be critical to establishment of reasonable estimates and funding procedures; and
- o State and other federal agencies now consider a broad range of decommissioning issues. The proposed NRC rules are not coordinated with the activities of state and other federal agencies. Public Systems believe the proposed rules are likely to disrupt and confuse regulation of decommissioning rather than clarify matters.

D.2.1(c)

D.2.1(a)

D.4.5

D.8.3.1

G.1

NRC, when it should be the real substance of this rule.

One of the most important decisions in decommissioning is whether to use DECON (immediate dismantlement), SAFSTOR (temporary storage with later dismantlement) or ENTOMB (permanent on-site storage). Yet there is no criteria given in the rule for how to make the choice among these options. Even the information supplied with the rule makes a clear case for how to evaluate these options, but the rule itself gives no guidance.

ENTOMB is not a realistic alternative and the rule should state that. There will obviously be special reasons at particular sites to choose the DECON option because of reasons such as poor original siting of a reactor, but in general the evidence suggests that partial decommissioning followed by a 50-year storage period (SAFSTOR) will be the best option in terms of the public health and safety. Radiation exposure to workers and the surrounding area will be lower and, equally as important, there will be a significant reduction in the radioactive wastes produced.

While SAFSTOR might slightly increase the total cost of decommissioning, the public benefits justify that cost. The rule should require that the choice of method be based on a detailed assessment of the effects on public health and safety so that a rational decision can be made. There should be clear criteria available for NRC review of that decision. Again the need for preparation of a full Environmental Impact Statement as part of a final site-specific plan is shown to be justified.

Another extremely important part of the decommissioning process is not addressed by the rule at all. Proper requirements for quality assurance and quality control during decommissioning are essential, including adequate monitoring by the NRC itself. This need is very apparent at Saxton. The original work in 1973 was supposed to have cleaned up several auxiliary buildings for unrestricted use. The AEC did not inspect for 13 months while work progressed. When an inspection finally occurred it was discovered that the buildings remained contaminated. Since the owner (General Public Utilities) had already dispersed its workers, those buildings remain contaminated today. Strict requirements for quality assurance must be a part of the rule.

We cannot understand why the rule specifically excludes from its requirements reactors which have already been permanently shut down. Saxton falls into this category and we think we should receive as much protection as anyone else who lives near a reactor.

The experience at Saxton also casts severe doubt on the adequacy of the proposed rule for estimating the costs of decommissioning. In 1973 GPU estimated that the total decommissioning cost, excluding continued maintenance for SAFSTOR of the plant, would be \$575,000. Even after the initial decontamination work had been done, in 1983 GPU's minimum estimate of the cost for the remaining work was \$12,454,000 or more than 21 times the original total estimate. Obviously not all of this increase was due to inflation. Saxton is only a 35 thermal

C.1.3

B.3.1.1

B.5

B.4.2

B.3.1.1

C.1.3

F.1

C.6

C.9

D.1.1.1

megawatt reactor and GPU's cost estimates assume the reactor vessel can be removed in one piece. To think that \$100,000,000 is a maximum figure for decommissioning plants 300 to 400 times the size of Saxton is unrealistic.

The proposed rule should be changed to require a decommissioning fund equal to the best estimate possible for the cost of decommissioning a particular site, and that estimate should be revised every five years so that an appropriate fund can be built up. Otherwise when the time comes to actually decommission a plant only a fraction of the funds required may be available.

The experience of GPU in approaching bankruptcy, with its main assets being inoperable nuclear plants, indicates why the set-aside funding for future decommissioning must be in external sinking funds which are legally separate from a utility's other assets. GPU has not been able to get a blank check from Pennsylvania ratepayers even in its emergency situation and therefore its cleanup at TMI-2 has been delayed. If the funds it had set aside for future decommissioning were part of its normal assets there would be no money available today for work at Saxton. We appreciate the fact that the Pennsylvania Public Utility Commission requires external reserves for decommissioning funds and the NRC should require the same method, along with insurance to provide funding in case of the early retirement of a plant such as happened at TMI-2.

The definition given for the term "decommissioning" is not complete in the proposed rule. Since the objective of decommissioning is to return a site to the same possibilities of use that the site possessed before a reactor was built on it, the definition should include language stating that the limit for residual radioactivity remaining should be the amount of natural background radiation at the site before construction of the plant. This is the only definition which can be acceptable by local residents whose children will be using the site in the future.

To summarize, the proposed rule is not complete since it does not provide specific criteria for making decisions about decommissioning and it leaves out several important topics. The rule should be redrafted and again submitted for public comment before it is accepted by the NRC.

Sincerely,

James H. Elder  
Chairman

D.1.1.1

D.2.1(a)

D.4.3

D.3.2.1.1(a)

D.3.2.2.1

E.1.1

G.1

Moreover, Public Systems object to provisions in the proposed rules which could be read to regulate or limit funding alternatives for government licensees.

The proposed rules would have broad and dramatic impact on the nuclear industry. At an annual average increase of 7 per cent in the CPI, the amount required to provide financial assurance for decommissioning under the NRC formula would increase from \$100 million to almost \$400 million per plant in ten years; in 35 years, the amount required would increase to \$19 billion per plant. The stated purpose of the NRC rule is to assure that decommissioning of all licensed facilities will be accomplished in a safe and timely manner and that adequate licensee funds will be available for this purpose. However, these purposes are not advanced if unwarranted burdens are placed on present owners of units and consumers of nuclear-generated energy; to the contrary, such burdens may further destabilize the nuclear industry. The critical question therefore, is: are the proposed rules likely to lead to the appropriate amount being collected for any particular plant? Public Systems believe the answer to this question is "no." As discussed below, existing state and federal regulatory procedures are more likely to lead to establishment of appropriate decommissioning fund estimates and with the exercise of expert guidance from the NRC, could be expected to ensure that adequate funds will be available for safe the timely decommissioning of licensed facilities. Therefore,

D.3.2.3

D.2.1(a)

D.8.1

D.8.3.1

Public Systems believe the NRC should withdraw the proposed rules relating to decommissioning costs and funding methods (specifically, §§50.33 and 50.54(cc)(1)-(3)). The NRC should, instead, provide guidance to state and other federal agencies considering decommissioning issues by (1) funding and supervising additional independent studies on decommissioning, and (2) working with agencies like FERC and the IRS to resolve issues, such as the appropriate methods and costs and the proper tax treatment of the decommissioning funds. To the extent the NRC believes there is some danger that utilities will not collect adequate funds to pay for decommissioning costs, the NRC could simply require that every utility licensee submit a decommissioning cost estimate to the state and federal agency responsible for regulating its rates.

If the NRC decides that it wishes to take a leading role in approval of decommissioning costs and approval of funding plans, then the proposed rules should be substantially amended to

1. Eliminate the \$100 million - 2 CPI formula;
2. Provide for appropriate challenges to decommissioning estimates; and
3. Provide for consistent and appropriate treatment of government licensees.

D.8.1

D.8.3.1

D2.1.(a)

D.4.5

D.3.2.3

I. THE PROPOSED NRC RULES ARE LIKELY TO LEAD  
TO A MISCOLLECTION OF DECOMMISSIONING FUNDS.

Proposed Rule 10 C.F.R. §50.54(cc)(2) requires each holder of an operating license for a nuclear plant to provide reasonable assurance that adequate funds will be available to ensure that decommissioning can be accomplished in a safe manner and that lack of funds does not result in delays that may cause potential health and safety problems. 50 Fed. Reg. at 5602. A utility must provide assurance that it will be able to decommission the plant at the end of its life, and must provide assurance that it will be able to decommission the plant in the event of a premature shutdown. Information adequate to provide assurance must be provided in any application for an operating license, or, in the case of existing licensees, must be submitted within two years of the effective date of the final NRC rule. Financial assurance for premature shutdown is provided by the insurance utility licensees carry pursuant to 10 C.F.R. §50.54(w). Financial assurance for end-of-life decommissioning may be provided in one of two ways.

The NRC has devised a decommissioning cost estimate and has provided that any electric utility may satisfy the proposed regulations by submitting a certification that financial assurance for decommissioning will be provided in an amount at least equal to this NRC estimate -- \$100 million in 1984 dollars, adjusted annually for inflation using an inflation rate twice

that indicated by the change in the Consumer Price Index. Under this alternative, there appears to be no requirement that the utility periodically update its decommissioning estimate for changes in technology. If wholesale customers or minority owners wish to challenge the established target, they presumably will have to petition the NRC to amend its rules. The NRC proposal does not provide for periodic review of its own estimate. 4/

D. 2.1 (a)  
D. 4.5

As an alternative to relying on the NRC estimate, a utility may submit a proposed "decommissioning funding plan." This plan must contain a cost estimate for decommissioning, and include means for adjusting cost estimates and associated funding levels over the life of the facility. Proposed Rule, 10 C.F.R.

§50.33(k)(1). However, the NRC Notice states that:

For many cases, routine adjustments for changes in inflation and interest rates might be done annually by the licensee and could be reported in the annual financial report without the need for NRC approval. A technical review of the information in the preliminary plans or the cost estimate for a funding plan could be done less frequently and submitted to the NRC for approval.

50 Fed. Reg. at 5608. 5/

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4/ The NRC simply provides that "[i]f decommissioning costs differ significantly in the future from that approximated by this prescribed amount, the regulation may be modified." 50 Fed. Reg. at 5606.

5/ Five years prior to the projected end of operation, a utility must submit a cost estimate for decommissioning based on an up-to-date assessment of the actions necessary for decommissioning. Proposed Rule, 10 C.F.R. §50.54(cc)(4). This update is required regardless of whether the utility has relied on its own decommissioning funding plan, or relied on the NRC's \$100 million estimate for purposes of decommissioning accruals.

Whether a utility submits a decommissioning funding plan, or relies on the NRC's \$100 million estimate, it must submit a plan for collecting the required funds. The rulemaking specifically describes four potential financing methods. Proposed Rule, 10 C.F.R. §50.33(k)(1). A utility may provide financial assurance by prepaying decommissioning expense; establishing an external sinking fund; arranging for adequate surety or insurance to provide for decommissioning; or (in the case of utilities owning more than one generating facility) establishing an internal reserve. The NRC would permit utilities to opt for either a funded or unfunded internal reserve. A utility may also use other financing methods which it demonstrates provide assurance comparable to the four methods described in the proposed rule. Proposed Rule, 10 C.F.R. §§50.33(k)(2)(i-iv), 50.33(k)(4).

As shown below, this package of rules is not likely to lead to collection of appropriate amounts for decommissioning particular plants; the rules should not be adopted as written.

D.8.1

A. The \$100 Million - 2 CPI Formula Should Not Be Adopted.

1. The \$100 million estimate

The rulemaking notice states that the NRC's \$100 million decommissioning cost estimate was based on two reports prepared for the NRC by the Battelle Pacific Northwest Laboratories. 6/

D2.1(a)

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6/ NUREG/CR-0130 "Technology, Safety and Costs of Decommissioning A Reference Pressurized Water Reactor Power Station" ("PWR Study") and NUREG/CR-0672 "Technology, Safety and Costs of Decommissioning A Reference Boiling Water Reactor Power Station." ("BWR Study").

These studies, known as the "Battelle Studies" or "PNL" studies, analyzed the cost of decommissioning reference nuclear reactors, and developed a formula for applying those costs to other nuclear plants. The \$100 million (the NRC states) is derived by escalating the Battelle estimates for the reference reactors to 1984 dollars, and adding additional costs for additional engineering and planning, use of contractors, variations in local labor rates, waste transportation costs and local power costs. The NRC states that the figure does not take into account the costs of shipments of spent fuel or "the costs of demolition of non-radioactive structures which is not required for NRC license termination." 50 Fed. Reg. at 5606.

However, the NRC's own documents escalating the Battelle figures to 1984 dollars do not support the \$100 million figure; the Battelle studies do not support application of a flat figure to plants of varying sizes and the expected variation in cost based on plant size and design indicates that use of a flat \$100 million amount is inappropriate.

Counsel for Public Systems submitted a FOIA request to the NRC on April 12, 1985 (FOIA-85-270) requesting, inter alia, "all materials (other than the NUREG reports) relied on by the NRC in concluding that \$100 million would cover decommissioning costs for most utility licensees" and requesting all materials "relied upon by the NRC to escalate the costs derived from the NUREG studies." In partial response, the NRC submitted a May 15, 1984

D.2.1(a)

letter from Richard I. Smith of Battelle Pacific Northwest Laboratories to Dr. Carl Feldman of the NRC's Chemical Engineering Branch (Attachment 1). This document does not support the NRC's \$100 million estimate. 7/ Mr. Smith escalated the Battelle study 1978 estimates to account for increases in staff labor, waste disposal and energy costs. He estimated that the cost of decommissioning a boiling water reactor (BWR), in 1984 dollars, would be \$92-95 million. The estimated cost of decommissioning a pressurized water reactor ("PWR") was substantially lower, in the range of \$69-72 million. 8/ Hence,

D.2.1(a)

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7/ It may be that there are other documents which the NRC relies on which it would contend support its \$100 million estimate; however, no such documents have been provided to Public Systems yet. If further information is received, Public Systems may revise their analysis. Public Systems are aware, of course, that some utilities have contended that, for their individual units, an estimate derived from the Battelle studies must be escalated to add on additional costs of engineering and planning, local power costs, etc. However, certain of Public Systems have examined such claims and found that such increases are not justified: utilities have based decommissioning energy costs on use of incremental energy costs, when there is no rule or regulation which provides that decommissioning energy is to be priced in that manner; utilities have "added on" costs for personnel, which on examination, appear to duplicate costs already included in overheads for decommissioning. Untested contentions by utilities would provide no basis for further escalation of the Battelle studies, and are, in any event, utility-specific.

8/ Mr. Smith noted that an argument could be made that staff labor costs for a PWR decommissioning should be increased 30-50 percent due to changes in assumed allowable occupational exposure levels. It is not clear such an adjustment is warranted (the letter does not indicate why costs would go up 30-50 percent; Mr. Smith's staff labor estimate already includes a 25 percent contingency and it is a high-side estimate, since it is based on Pacific labor costs, which Mr. Smith estimates results in \$9 million in higher costs than would be derived using labor costs for the

[FOOTNOTE COINTINUED ON NEXT PAGE]

the NRC rule would entitle a utility with a PWR reactor to overcollect almost \$30 million in decommissioning costs from ratepayers, before the effects of escalation are even considered. While the difference between the proposed rule and the BWR estimate is relatively smaller, it is still a \$5-7 million differential. Thus, neither the PWR or BWR estimates as escalated by Battelle support the NRC's \$100 million estimate. There is no reason to promulgate a rule which (by the NRC's estimate) institutionalizes overcollection of decommissioning funds. Cf. Buckeye Pipeline Co., 13 FERC ¶61,267 at p. 61,594 (1980).

D.2.1(a)

Moreover, because the NRC \$100 million estimate does not include decommissioning costs for non-radioactive structures, adoption of that estimate does not even have the advantage of laying decommissioning issues to rest. Utilities can be expected to seek additional decommissioning costs associated with non-radioactive structures in state and federal proceedings. 9/

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[FOOTNOTE CONTINUED FROM PRECEDING PAGE]  
Southeast). In any event, a 50 percent increase in staff labor would increase Mr. Smith's decommissioning estimate to between \$78-81 million, still far below the \$100 million NRC estimate. 9/ It is clear that the NRC's estimate does not include balance-of-plant decommissioning costs because it is clear that Mr. Smith's analysis did not escalate the balance-of-plant costs for the reference reactors. It should be emphasized that while Mr. Smith did not escalate balance-of-plant costs, these costs are included in the Battelle studies. See e.g., Battelle PWR study, Volume 1 at 9-9, 10-2, 10-6; Battelle PWR study, Addendum, at 3-50, 3-56 through 3-58.

Even if the \$100 million estimate were corrected to more accurately reflect costs associated with the required dismantlement of PWR's and BWR's, it would still be inappropriate to apply that estimate to all nuclear plants, regardless of size and design. The Battelle estimate for a reference PWR reactor (from which the NRC \$100 million estimate was in part derived) was developed by examining in detail the cost of decommissioning Portland General Electric Company's Trojan Nuclear Plant, a 1,175 Mw(e) station with a four-loop pressurized water reactor and cooling tower. The NRC would permit application of its \$100 million estimate to plants such as Yankee Rowe, a 175 Mw(e) station; Vermont Yankee, a 504 Mw(e) station; and Maine Yankee, a 810 Mw(e) station, despite the fact that (given the substantial difference in size) the cost of decommissioning these units could be expected to be lower than the cost of decommissioning the Trojan plant. Indeed, the Battelle study addendum estimated the cost of decommissioning the major components of Yankee Rowe at \$3.048 million (1978 dollars), less than a third of the \$10.591 million (1978 dollars) estimated major component decommissioning cost for the Trojan plant. Battelle PWR Study, Addendum at 3-11.

The Battelle study authors warned against application of a flat estimate to all plants. In Volume 1 of the PWR study, they warned that [a]pplication of these results to situations where the conditions are different ... could produce erroneous conclusions." Battelle PWR Study, Vol. 1 at 2-4; see also Vol. 1

D.2.1(a)

at 4-10. After more than a year of further study, Battelle submitted an addendum to the initial study. The purpose of the addendum was to determine a reasonable method of estimating the cost of decommissioning where conditions differed from those considered in analysis of the Trojan plant. Battelle PWR Study, Addendum at 1-1, 3-1. The Battelle authors developed an overall scaling factor (OSF) to permit estimation of decommissioning costs based on unit size. Public Systems do not object to use of an OSF to estimate decommissioning costs; indeed, some of them have urged adoption of decommissioning estimates based on application of the OSF to particular plants (see Affidavit of Jacob Pous). However, what the NRC has done is to ignore the OSF -- which makes the Battelle decommissioning estimate applicable to units of varying size and design -- and adopt a flat decommissioning estimate. The Battelle comparison of Yankee Rowe and the Trojan Plant indicates quite clearly that the NRC's approach is inappropriate.

As explained in the Affidavit of Jacob Pous, the substantial differences in size among reactors results in substantial differences in decommissioning cost estimates. Further, decommissioning expense can be substantially reduced by sequential decommissioning of units at multiple-unit sites. Nonetheless, the NRC estimate does not take into account a utility's plans for decommissioning.

D.2.1(a)

The NRC's proposed rule cannot be justified merely because the proposed rules also provide that utilities can submit their own decommissioning estimate if they do not wish to use the \$100 million estimate. First, the rules do not appear to provide an opportunity to challenge a utility's decision to rely on the NRC estimate. Investor-owned utilities which own small reactors could well have a strong incentive to use the NRC estimate rather than expend money to prove they are entitled to less money from their customers. Second, the \$100 million will undoubtedly influence state and federal commission decisions, 10/ discouraging more detailed investigation into decommissioning costs. Hence, adoption of a \$100 million estimate, applicable to all plants, is likely to lead to mismatching (both over and under) of decommissioning funds.

D.4.5

D.2.1(a)

2. The two times CPI escalator adopted by the NRC is inappropriate.

The NRC proposes to require utilities using the NRC decommissioning estimate to escalate the \$100 million by two times the CPI annually. \$50.33(k)(1). The NRC appears to have opted for an automatic escalation factor in an attempt to ensure that decommissioning accruals reflect changes in decommissioning

D.2.1(a)

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10/ It would not only influence, it would effectively determine the decisions of state and federal ratemaking commissions. Unless it is assumed that utility stockholders contribute to the costs of decommissioning, then the only way a utility may be able to demonstrate \$100 million of financial assurance would be by obtaining the authorization of ratemaking commissions to collect this amount from ratepayers.

costs, while minimizing regulatory burden. 50 Fed. Reg. at 5606. Using an automatic two times CPI escalator may reduce the regulatory burden which arises if utilities are required to obtain approval for increases in decommissioning accruals. However, whatever benefits might follow from reduction in regulatory burden are more than outweighed if the automatic escalator is inaccurate, and, for the reasons discussed below, the escalator is inaccurate in this case. The two times CPI figure cannot be supported based on an analysis of historical data. There is no reason to suspect that decommissioning costs will increase at two times the CPI into the future. There are reasonably accurate and readily available sources of information which can be used to escalate decommissioning costs to account for price changes.

D.2.1(a)

D.2.1(b)

Counsel for Public Systems obtained the calculation supporting the NRC's adoption of a two times CPI inflation factor in the NRC response to the April 12, 1985 FOIA request. The calculations are shown on a note to file from the Chemical Engineering Branch Decommissioning Staff. The note calculated the percentage increase in waste disposal costs from 1978 to 1984 (expressed as a multiplier of the CPI); calculated the percentage increase in labor costs (also expressed as a multiplier of the CPI); and developed a weighted percentage increase for total decommissioning costs, expressed as a multiplier of the CPI. However, as explained in the attached Affidavit of Jacob Pous, in

D.2.1(a)

performing these calculations Staff rounded the percentage increases from 1978 to 1984, and made certain calculation errors. Mr. Pous followed Staff's general methodology, but corrected for the rounding and calculation errors; he found that total decommissioning costs had increased only 1.47 times the CPI from 1978-1984. The difference between using a 1.47 times the CPI escalator instead of a 2 times CPI escalator is akin to the difference between obtaining a mortgage for a home (when the CPI is increasing 6 percent annually) at 8.8 percent as compared to 12 percent. It is easy to see that this variance would make an enormous difference in mortgage payments, particularly if one is considering the costs associated with a \$100 million "home." The NRC's formula for escalation, if used at all, must therefore be corrected to avoid overcollection.

D.2.1(a)

However, Cities believe that use of an escalation factor tied to the recent CPI is incorrect. Decommissioning costs appear to have risen faster than the CPI because of the dramatic increase in waste disposal costs from 1978 to 1984. There is no reason to believe that waste disposal costs will continue to increase at that same rate of increase into the future. Hence, there is no basis for assuming that the relationship between CPI and decommissioning costs will hold into the future. Indeed, the NRC Staff recognized this fact in the note to file which contains the two times CPI calculation:

These factors are based on the historical period noted. Waste disposal costs in the future are uncertain.

As suggested at the outset, using a two times CPI escalation factor will dramatically increase total decommissioning costs. At a seven per cent annual average increase in the CPI, indicated decommissioning costs at the end of ten years would be over \$400 million; in 35 years, the indicated decommissioning cost would be \$19 billion. Placing such a potential burden on ratepayers and utilities on the basis of such a tenuous relationship is not appropriate.

Moreover, reliance on an inaccurate escalation factor is not necessary. As explained in Mr. Pous' affidavit, there are readily available sources which provide more accurate measures of decommissioning cost increases. These include the Handy-Whitman index and tariff sheets showing the schedule of charges for waste disposal. Such sources were relied on by Mr. Smith in updating the Battelle reports to 1984 dollars, and thus were relied on by Staff, which took Mr. Smith's escalation figures and translated them to a multiplier of the CPI. In essence, adopting the two times CPI formula amounts to taking a roundabout route where a direct route is available. Should the NRC wish to establish an escalation factor, it should provide that escalation rates will be based on the Handy-Whitman index (taking into account the tariff sheets for waste disposal if required).

D.2.1(a)

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11/ It is Public Systems' position that the NRC should withdraw those parts of the rule establishing the decommissioning estimate and inflation factor.

B. The Proposed Rules Do Not Provide for Procedures Likely To Lead To Establishment Of An Appropriate Decommissioning Amount.

Public Systems do not object to rules which permit utilities initially to develop their own decommissioning estimate, select one of a number of possible funding methods, or analyze various methods of decommissioning a nuclear unit. Indeed, Public Systems believe it is appropriate to allow flexibility in decommissioning planning. However, and critically, it is not clear that the NRC has considered or devised efficient and fair procedures for supervising the initial choices made by the private utilities as to their decommissioning plan choices.

Public Systems' experience indicates that such procedures may be essential to establishment of a reasonable decommissioning estimate, and to establishment of a reasonable plan for funding decommissioning.

Public Systems may be affected by inaccurate utility decommissioning estimates both as customers and co-owners of nuclear generation. As customers, decommissioning costs are reflected in wholesale rates or in power contracts. As owners, many of Public Systems rely on decommissioning estimates developed by co-owner utilities to develop estimates of their own decommissioning responsibilities. Hence, many of Public Systems have recently been involved in rate cases at the Federal Energy Regulatory Commission ("FERC") which involved decommissioning issues, and have strenuously challenged utility-developed

D.2.1(c)

decommissioning estimates. 12/ These proceedings have involved substantial dollar disputes: in recent cases the difference between the Company estimate and estimates by FERC Staff and intervenors has exceeded \$50 million. These disputes do not disappear in cases where a utility relies on the Battelle studies "with suitable adjustments for inflation and for site-specific factors." 50 Fed. Reg. 6504. There may and in fact, have been substantial disputes as to whether some or any "site-specific factors" need to be taken into account, and disputes as to how those factors should be taken into account. 13/

D.2.1.(c)

Further, in the past certain of Public Systems have challenged as to the method of decommissioning assumed by the Company in establishing its decommissioning estimate; the use of an external or internal fund by particular investor-owned utilities; and the propriety of permitting an investor-owned utility to control decommissioning funds, where it would be more cost-effective for each Public System to maintain a separate fund

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12/ Thus, for example, certain of Public Systems have challenged utility estimates based on: the assumption that it takes nearly ten minutes to lay a square foot of sod; use of a daily rental rate for equipment being used for a long period instead of a much cheaper monthly rate; and data for which there is no support and where the utility has destroyed backup information.

13/ As the NRC recognizes, the Battelle studies' overall scaling factor was developed taking design differences into account. Hence, before adjusting for costs which may be higher than those incurred in decommissioning the reference reactors, it is necessary to consider whether other costs might be lower.

covering its decommissioning obligation. There has, in short, been a need to provide for opportunities to challenge utility-selected plans; that need will not disappear under the proposed rules. However, it is not at all clear that the proposed rules are intended to provide for the necessary supervision and regulation of proposed utility decommissioning estimates. Indeed, it appears that the NRC intended that some matters would not be subject to review at all. Thus, the proposed NRC rules do not establish a required method of decommissioning, but instead allow licensees to consider alternative methods. 50 Fed. Reg. 5601. Under the proposed rules, one year prior to expiration of the operating license for a plant (or within two years following permanent cessation of plant operations, if that should occur sooner) a licensee must submit a plan to the Commission indicating which alternative for decommissioning it has chosen. Proposed Rule, 10 C.F.R. §50.82. <sup>14/</sup> However, the rules do not restrict the utility in any way in selecting a decommissioning method for purposes of decommissioning accruals. FERC precedent suggests that the utility will generally only be allowed to recover costs associated with the least cost method. Connecticut Light & Power Co., 13 FERC ¶61,155 (1980). Absent an opportunity to challenge a decommissioning estimate, the NRC rule appears to permit a utility to devise a decommissioning estimate based on

D.2.1(c)

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<sup>14/</sup> Generally, the NRC expects utilities will choose the immediate dismantlement option, absent a showing that some other method would be appropriate.

the most expensive decommissioning alternative available. The funding method chosen by a utility will have a significant effect on the cost to customers and co-owners, since different methods may give rise to different tax liabilities. The cost of decommissioning could effectively double if a utility opts to provide for decommissioning expense using an alternative which is not subject to favorable tax treatment. While the NRC recognizes this problem, (50 Fed. Reg. at 5608), the NRC rule does not explicitly require utilities to use the least-cost funding method, nor does it provide for the opportunity to challenge the funding method chosen.

Should the NRC decide to adopt the proposed rules, these rules should be substantially modified to provide for procedures which protect the interests of customers and co-owners. These procedures would necessarily involve opportunities to challenge utility certificates of financial assurance for decommissioning and decommissioning funding plans when filed, and the opportunity to require periodic review of these estimates.

Further, while the NRC justifiably considered public safety and administrative convenience in devising its proposed rules, a procedure for establishing decommissioning costs must also provide for consideration of other important interests. One issue considered as part of rate proceedings, for example, is to what extent current ratepayers should be forced to support a fund based on an estimate of expenses which may never materialize, especially as technology and experience in the area grow.

D.4.5

D.3.3.5

D.8.1

D.8.3.1

If the NRC is to enter into the realm of ratemaking, Public Systems believe it should be required to consider such issues if requested to do so prior to allowing a utility to use the flat \$100 million estimate, or prior to approving the level of a decommissioning fund. The NRC should consider whether consideration of decommissioning issues would fit easily into existing NRC proceedings, or is practical in light of limited agency resources, and the existence of other ratemaking agencies. For example, it may not be appropriate to consider decommissioning issues as part of operating licensing procedures; given the potential for delay, separate proceedings may be more appropriate. 15/

However, before adopting any procedures, the NRC should consider carefully whether it needs to involve itself in the implementation of decommissioning costs. As suggested in Section III, existing regulatory procedures already provide for consideration of decommissioning issues or can be expected to protect the public interest -- particularly if the NRC provides expert guidance on certain specific issues.

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15/ For example, it may be sensible for the NRC to require utilities to meet with customers prior to submitting a information to the NRC concerning decommissioning, to attempt to resolve disputes informally. The NRC rule should provide for a hearing procedure if disputes cannot be resolved.

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D.8.1

II. THE RULE IS FLAWED IN OTHER REGARDS,  
INCLUDING IN ITS TREATMENT OF GOVERNMENT BODIES.

The Notice of Rulemaking states that in the case of government licensees, guarantees of financial responsibility by the appropriate state, federal or local government entity are adequate to provide financial assurance for decommissioning. 50 Fed. Reg. at 5607. In the event the NRC adopts any rules regarding financial assurance for decommissioning, such a provision is appropriate. However, the rules do not clearly implement the intent expressed in the Notice. While language regarding guarantees by governmental entities appears in §50.33(k)(3)(financial assurance for licensees other than electric utilities), it does not appear in §50.33(k)(4) (financial assurance for electric utilities). These sections would have to be amended to make it clear that guarantees of financial responsibility are adequate for governmental entities which also happen to be public utilities. 16/

D.3.2.3

Indeed, the rules as now written could be read to restrict funding alternatives available to public agencies. Thus, §50.33(k)(4)(iv) provides that internal sinking reserves may be used to fund decommissioning in the case of electric utilities more than one generating facility. Whatever the propriety of such restrictions for investor-owned utilities, they are not appropriate for governmental entities. For example, the only

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16/ Such provisions are appropriate given the fact that, unlike private licensees, governmental licensees are subject to continuing scrutiny by local agencies for financial stability and cannot limit their responsibilities by leaving the jurisdiction.

unit owned by NCMPA is a nuclear unit, Unit No. 2 of the Catawba Nuclear Station. NCMPA is presently collecting amounts for decommissioning through an internal fund; that internal fund is required under NCMPA's bond resolution. The bond resolution requires NCMPA to make deposits to the Decommissioning Fund on a monthly basis, and places limits on the manner in which decommissioning funds may be used. NCMPA's decommissioning obligations are secured by its contracts with its participating municipalities. NCMPA's operations are subject to direct scrutiny by a division of the Department of State Treasurer, the Local Government Commission of North Carolina. The Local Government Commission by law monitors certain of NCMPA's operations and has power to ensure that NCMPA's financial obligations are met. Thus, NCMPA's internal fund consists of real dollars, not just accounting entries, is closely scrutinized by the state and is governed by local government units. Application of restrictions on funding methods to governmental entities such as NCMPA would not enhance financial assurance. On the other hand, application of the rule in the case of NCMPA (and perhaps others), could raise questions concerning existing bond and other financial arrangements, to the detriment of the public. Any portions of the proposed rules which could be read to restrict funding alternatives for public bodies should therefore be amended to remove any such implication. 17/

D.3.2.3

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17/ Certainly, it would not be appropriate or beneficial to adopt a  
[FOOTNOTE CONTINUED ON NEXT PAGE]

III. THE PROPOSED RULE IS UNNECESSARY  
AND IS NOT COORDINATED WITH  
EXISTING REGULATORY PROCEDURES.

A. Existing Procedures Provide Adequate Assurance That The  
Decommissioning Funds Will Be Available In The Future.

Decommissioning costs are now the subject of regulation by state and federal commissions. At the Federal Energy Regulatory Commission, for example, decommissioning expense is generally considered during the course of ordinary rate proceedings. In such proceedings, the burden of proof is on the utility to show that the decommissioning costs asserted are just and reasonable. Federal Power Act §205, 16 U.S.C. §824d. 18/ The FERC has rejected utility decommissioning cost estimates where the utility has failed to provide convincing studies to support those costs, Pacific Gas & Electric Co., 16 FERC ¶63,004 at p. 65,008 (1981), aff'd, Pacific Gas & Electric Co., Opinion No. 147, 20 FERC ¶61,340 (1982). Hence, as a practical matter a utility is required to submit support for its cost estimates; those estimates and supporting studies are then subject to study and challenge by FERC Staff and intervenors.

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D. 8.3.1

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[FOOTNOTE CONTINUED FROM PRECEDING PAGE]  
rule which has the effect of disrupting existing financial arrangements.

18/ Indeed, the FERC has held that a change in decommissioning charges is a change in rates which requires Commission approval pursuant to Section 205 of the Federal Power Act. Arkansas Power & Light Co., 23 FERC ¶61,013 (1983); Pennsylvania Power and Light Co., 23 FERC ¶61,006 (1983).

Utility estimates may be supported in a variety of ways. Some utilities have used the scaling factors developed in the Battelle studies, but adjust the resulting decommissioning estimate on the basis of claimed differences between costs as reflected in the Battelle studies and costs for decommissioning a specific plant. Other utilities have performed studies which they label "site specific" studies. Site specific studies (theoretically) develop unit costs associated with particular decommissioning tasks 19/ and apply those cost factors to the volume of material at a particular plant. FERC Staff prepares an independent estimate using the Battelle study, updated to reflect the effect of inflation. Intervenors may also develop independent estimates, and may challenge the sufficiency of other estimates submitted.

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Proceedings are not limited to consideration of decommissioning costs. There may be disputes as to decommissioning methodology; funding methods (internal versus external funds); and the service life of the plant (as part of a determination of the period over which funds are to be accrued).

The FERC considers a number of factors in resolving such disputes. 20/ The Commission has recognized that it is fair for

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19/ E.g., cost of demolishing each cubic foot of reinforced concrete.

20/ There are two paths to resolving disputes among the utility, FERC Staff and intervenors. The parties can settle, agreeing on some figure to be used for decommissioning accruals. For example, the FERC has approved settlements in Yankee Atomic  
[FOOTNOTE CONTINUED ON NEXT PAGE]

today's ratepayers to pay some portion of the costs associated with decommissioning, since they are receiving benefits associated with the plant. Vermont Yankee Nuclear Power Corp., 26 FERC ¶61,420 (1984). At the same time, the FERC has recognized that decommissioning estimates are uncertain, and that they can be updated to avoid significant shortfall. Therefore:

Given the highly speculative nature of [decommissioning methodology] at this time, we are reluctant to allow a charge to be assessed that may exceed on a proportionate basis the true cost of decommissioning....[W]e choose to err if at all on the downside rather than run the risk of over-charging current customers.

D.8.1

Connecticut Light & Power Co., 13 FERC ¶61,155 at p. 61,332 (1980), aff'g 5 FERC ¶63,004 at p. 65,075 (1978).

Thus, the Commission has decided that it is not appropriate to protect future consumers to the greatest extent by choosing the highest possible decommissioning cost estimate. This approach makes particularly good sense in light of the fact that under the Federal Power Act utilities are free to make filings to adjust their rates to reflect increased costs, including decommissioning costs. 21/

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[FOOTNOTE CONTINUED FROM PRECEDING PAGE]  
Electric Co., Docket Nos. ER80-569 and ER80-570 (1981) and Maine Yankee Atomic Power Co., Docket No. ER82-15-000 (1982) where the decommissioning accruals were based on cost estimates derived from the Battelle studies. If disputes cannot be resolved by settlement, decommissioning estimates are the subject of hearing, where the utility, Staff and intervenors have the opportunity to present evidence and to cross-examine opposing witnesses.

21/ Cf. Commonwealth Edison Co., Opinion No. 165, 23 FERC ¶61,219 (1983)(rejecting claim that failure to approve company estimates  
[FOOTNOTE CONTINUED ON NEXT PAGE]

Other factors have also been considered by the Commission in the course of establishing an appropriate decommissioning accrual rate. These include consideration of tax effects, 22/ and whether the Company has adopted a funding method which provides assurance that it will be able to pay costs at the time they are incurred, taking into account the financial health of the Company and the assets under its control. 23/

In light of this already-existing regulatory framework, it is difficult to understand what purpose the NRC's proposed regulations serve or are intended to serve. It does not appear that the NRC rules would provide for consideration of interests now being overlooked by agencies. Indeed, as suggested by the foregoing, existing procedures at FERC provide for appropriate weighing and balancing of the various interests implicated by decommissioning issues. It cannot be argued that the NRC rules will lead to more reasonable resolution of decommissioning disputes. The proposed rule does not purport to establish an accurate decommissioning estimate; it

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for depreciation costs for nuclear-related facilities will result in underrecovery of costs, since Company is free to adjust rates using up-to-date information, and, indeed, is obligated to update depreciation rates to assure that the service value of electric plant is recovered over its useful life).

22/ Vermont Electric Power Co. Inc., 23 FERC ¶61,219 (1983).

23/ Boston Edison Co., Opinion No. 156, 21 FERC ¶61,327, p. 61,881 (1982); see also Maine Yankee Atomic Power Co., 20 FERC ¶61,141 (1982) and discussion by Administrative Law Judge in Middle South Energy Co., 26 FERC ¶63,044, p.65,137-65,139 (1984).

does not require adoption of particular decommissioning methods for which decommissioning costs should be determined. See discussion of decommissioning methods in Connecticut Light & Power Co., 13 FERC ¶61,155, p. 61,332. 24a/ The NRC may have been concerned that state and federal agencies might resolve decommissioning issues differently, or that different decommissioning estimates might be established for a single unit owned by a utility subject to dual regulation. However, so long as both jurisdictions provide for collection of some reasonable amount for decommissioning, the public interest in ensuring adequate funds are available at the time of decommissioning is satisfied.

Further, it is not clear how the NRC intends for its regulations to fit with existing state and federal regulation of decommissioning costs. 24b/ If, on the one hand, the NRC intends that state and other federal agencies will continue to have primary responsibility for establishing decommissioning costs, then the rule is redundant or possibly mischievous. A flat rate would effectively establish a "floor" at some commissions and a "ceiling" at others. If the NRC intends to take over

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24a/ There are at least two ways in which the proposed rules do provide useful guidance, albeit indirectly. Disputes may arise as to the appropriate useful life of a nuclear unit; §50.51 suggests that the NRC expects the useful life will be at least equal to the license term. Further, disputes have arisen as to the propriety of using the Battelle studies as a base for decommissioning estimates. The Notice indicates that use of such studies is appropriate. 50 Fed. Reg. 5604.

24b/ Furthermore, the NRC may be acting in an area outside its jurisdiction insofar as the rate-setting aspects of its rule are concerned.

functions now being performed by other agencies, Public Systems believe the Rule is inadequate. In addition to the substantial modifications that would be required (discussed in Sections I and II), the NRC should recognize other complications. To avoid these, the NRC should make it very clear what functions it intends to supplant. The NRC should recognize that imposing its regulations on existing regulation may mean that requirements presently in force, such as the FERC requirement that a utility regularly update decommissioning cost estimates, may become duplicative. Further, to the extent the NRC seeks to exercise control over the economic matters related to decommissioning expense, NRC action of the sort proposed here could be expected to give rise to serious jurisdictional disputes, which cloud, rather than clarify, regulation of decommissioning costs. See e.g., Pacific Gas & Electric Co. v. Energy Resources Commission, 461 U.S. 190 (1983). 25/

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25/ It is not clear what rate-setting functions the NRC intends to assume, if any. However, to the extent the NRC intrudes into the economic regulation of decommissioning costs serious jurisdictional questions may be raised. Thus, in Pacific Gas & Electric Co. the Court noted that the NRC "does not purport to exercise its authority based on economic considerations," and had recently repealed its regulations concerning the financial qualifications of utilities proposing to operate or construct nuclear plants. 461 U.S. at 207.

The NRC cannot justify requiring collection from present customers on the ground that funds are needed in the event of premature decommissioning; the NRC's proposed rules recognize that a utility may provide adequate financial assurance for decommissioning by maintaining insurance. Further, the NRC's discussion of internal funding recognizes that multiple-asset utilities are likely to have sufficient assets to meet

[FOOTNOTE CONTINUED ON NEXT PAGE]

Before the rules are adopted, therefore, the NRC needs to carefully consider what it intends the rules to accomplish and whether, in fact, the rules are necessary. As suggested above, the rules are not necessary and indeed, probably would result in more harm than good.

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#### IV. RECOMMENDATIONS

Under the circumstances, it appears to Public Systems that the proposed rules relating to decommissioning costs and funding methods are not necessary and should not be adopted.

Public Systems believe there are positive contributions the NRC could make to decommissioning analysis. For example, publication of the Battelle studies provided an independent data base now being used by state and federal commissions to evaluate decommissioning claims. (Prior to publication of the Battelle studies, the FERC had denied requests for decommissioning allowances on the ground that inadequate information existed as to decommissioning costs. Carolina Power & Light Co., 4 FERC ¶61,107 (1978)). Similarly, the NRC could enhance the existing

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decommissioning responsibilities in the future; hence, as far as utilities are concerned, it is not clear that the collections from today's ratepayers are necessary in the interest of public safety. Moreover, questions as to allocation of costs between present and future ratepayers would seem within the ordinary jurisdiction and expertise of the FERC or appropriate state commission.

regulatory process by periodically sponsoring other independent analyses of decommissioning expense. 26/

G.1

Uncertainty concerning the tax status of decommissioning funds is a major obstacle to development of adequate and equitable decommissioning funds. The NRC could provide a valuable contribution if it worked with the other agencies, including the IRS, to provide for appropriate tax treatment of decommissioning funds.

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Such actions obviously do not require the NRC to issue the sort of broad rules it has proposed here. Further, should the NRC fear that some utilities would fail to seek to recover decommissioning expenses, the NRC could simply provide that every utility licensee shall seek recovery of costs from the appropriate state and federal commissions which regulate its rates. Again, a broad rule is not required.

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D.8.3.1

Should the NRC opt to adopt rules along the lines of those proposed, it should

- o eliminate the \$100 million - 2 CPI formula;
- o provide for a reasonable procedure for resolving disputes requesting decommissioning estimates, including participation by interested parties; and

D.2.1(a)

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26/ Given the electric utility industry's incentives to justify high decommissioning costs, their studies cannot be relied upon to provide impartial analysis of changes in decommissioning requirements.

- o provide for consistent treatment of governmental licensees by allowing them to certify that their obligations under the rule can be satisfied.

D.3.2.3

Respectfully submitted,

  
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Frances E. Francis

  
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Systems

May 13, 1985

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(50 FR 5600) (63)

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May 13, 1985

Samuel J. Chilk, Esq.  
Secretary  
U.S. Nuclear Regulatory  
Commission  
Washington, D. C. 20555

Attention: Docketing and Service  
Branch

Re: Proposed Amendments to 10 C.F.R. Parts 30, 40,  
50, 51, 70, and 72, Decommissioning Criteria for  
Nuclear Facilities

Dear Mr. Chilk:

By a notice published on February 11, 1985, the Commission requested public comments on a series of proposed amendments to its regulations concerning the decommissioning of various types of nuclear facilities. 50 Fed. Reg. 5600. As attorneys representing a number of utilities involved in the Commission's licensing and regulatory process, we wish to offer comments on the proposed amendments. Our comments are focused upon the financial and rate regulatory aspects of the proposed amendments; we do not address the technical bases for decommissioning requirements or the dollar amount, if any, that should be prescribed for decommissioning. Because each of our clients owns and operates one or more power reactors, our comments will be directed solely to proposed changes in 10 C.F.R. Parts 50 and 51.

We strongly support the adoption of regulations that permit electric utilities to provide reasonable assurance of

D. 3.2.1.2  
D. 8.1

MAY 15 1985

Acknowledged by card.....  
*pd*

Samuel J. Chilk, Esq.  
May 13, 1985  
Page 2

adequate funding for decommissioning by the creation of an internal reserve based either upon net negative salvage included in depreciation or an internal sinking fund. Both types of internal reserves are currently in use and have been approved by state ratemaking commissions. In many cases, substantial reserves have already been created. To now require the adoption of a different funding method could be extremely disruptive. It would certainly require substantial retroactive accounting adjustments, and it might require retroactive financial disclosure.

D.3.2.1.2

There is no reason to doubt the security of an internal reserve in a typical multi-asset electric utility. Such firms typically have large non-nuclear investments and sufficient annual earnings and cash flow to defray the expenses of decommissioning as they come due. If present trends continue, the ratio of non-nuclear to nuclear assets will increase in future years, since no additional nuclear facilities will be constructed, while rising electrical demand will require the addition of other utility plant. The maintenance of a segregated external fund in such circumstances is simply unnecessary.

D.3.2.1.1(b)

The use of an internal reserve for decommissioning enhances the financial stability of an electric utility, since the funds in the reserve reduce the need for external financing to add utility plant. The use of an internal reserve is also advantageous to the customers of the utility. A utility can earn more on an internal reserve than can be obtained through investments by an external sinking fund. Consequently, annual payments into the internal reserve, particularly in the earlier years, can be significantly lower, thus reducing the cost to the consumer.

D.3.2.1.1(b)

In approving the use of an internal reserve, the Commission may wish to clarify statements made at 50 Fed. Reg. 5608 concerning building up a decommissioning fund where the fund was not established at the beginning of facility life. If an internal sinking fund is used, it is acceptable, in calculating the annual funding required, to take into account the time value of money, resulting in lower funding requirements in the early years. Any requirement to catch up on funding an internal sinking fund that was not established at the beginning of facility life should recognize that the amount to be "made up" may properly take into account a lower level of payments for the first years of facility life.

D.4.6.1

Samuel J. Chilk, Esq.  
May 13, 1985  
Page 3

The Commission should recognize that there is a considerable tension between its desire to have reasonable assurance of funding for decommissioning and the jurisdiction of the Federal Energy Regulatory Commission and the various state ratemaking agencies to determine the appropriate method and level of financing. To the maximum extent possible, the Commission should avoid prescriptive requirements for decommissioning funding. The regulations as proposed afford utilities and their economic regulators some latitude. Additional requirements by the Commission do not appear to be necessary, and further intrusion on the regulatory authority of other agencies should therefore be avoided.

D.8.3.1

In that regard, the proposed regulations should be changed, prior to adoption, to eliminate the reference in proposed § 50.33(k)(2)(iv) to the issuance of bonds at the end of facility life. There is no apparent reason why a bond issue should be required. The utility may well be able to meet the expenses of decommissioning from internal funds, through short-term borrowing, the issuance of common or preferred stock, or by other forms of credit. Other financing methods may be more attractive to the utility, or less expensive to the ratepayers, or both. Any suggestion that a bond issue is a regulatory requirement should be removed.

D.3.3.3

At 50 Fed. Reg. 5609, Commissioners Asseltine and Bernthal have requested comments on the possible impact of insolvency on the continued availability of decommissioning funds. In response, we offer two observations. First, there is no meaningful distinction between "unsegregated" internal funding and an internal sinking fund. In the unlikely event of a utility bankruptcy, control of either type of fund would pass to the trustee. (The Commission, of course, could intervene before the bankruptcy court and seek an order requiring use of the fund for its intended purpose.) Second, the same conclusion may apply to an external sinking fund. In the absence of any clear legal precedent (because there has not been a utility bankruptcy since the Great Depression and the statute has been substantially amended in the meantime), there can be no assurance that an external sinking fund would be "bankruptcy proof". The answer could vary depending on the precise terms of the trust for the fund and on state law governing trusts.

D.3.2.1.1(b)

An external sinking fund makes sense for a single-asset nuclear utility, whose cash flow will essentially

Samuel J. Chilk, Esq.  
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Page 4

terminate at the end of facility life. For a multiple-asset company, reasonable assurance can best be provided by the financial stability of the utility, rather than overly-prescriptive funding requirements embodied in the Commission's regulations.

D.3.2.1.1(b)

Finally, the Commission is clearly correct in concluding that no environmental impact review is required for the approval of decommissioning funding plans. Approval of a funding plan does not authorize any physical activity or change the way a power reactor is operated. It simply has no effect on the environment. The proposed amendment to § 51.22(c) is appropriate and should be adopted.

F. 1

Sincerely,  
LeBOEUF, LAMB, LEIBY & MacRAE

By Harry H. Vaigt  
Partner

PROPOSED 10 CFR - 39, 40, 50 et al  
(50 FR 5600) (6A)

THE ASSOCIATION OF THE BAR  
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COMMITTEE ON NUCLEAR TECHNOLOGY AND LAW

DOCKETING  
BRANCH

May 13, 1985  
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Office of the Secretary of the Commission  
United States Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF THE  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Re: 10 CFR Parts 30, 40, 50, 51, 70 and 72  
Decommissioning Criteria for Nuclear Facilities  
(50 Fed. Reg. 5600, February 11, 1985)

Dear Sirs:

On February 11, 1985, the Commission published for public comment proposed Decommissioning Criteria for Nuclear Facilities (50 Fed. Reg. 5600). The Committee on Nuclear Technology and Law of the Association of the Bar of the City of New York wishes to take this opportunity to express its views on one aspect of the financial assurance requirements of the Commission's proposed decommissioning criteria. The Commission has determined, among other things, that the internal reserve method for funding decommissioning costs would generally be acceptable for electric utility licensees maintaining the on-site property damage insurance coverage required by 10 CFR §50.54(w) of the Commission's regulations. It is concerning this narrow issue that the Committee wishes to address its comments.

In the Supplementary Information accompanying the decommissioning rulemaking, the Commission recognizes that while under normal circumstances the internal reserve funding mechanism should provide reasonable assurance of adequate funds to decommission the facility, the viability of this method is dependent upon the licensee's financial solvency (50 Fed. Reg. at 5608). Thus, the Commission observes that if the licensee encounters serious financial difficulty or becomes bankrupt, the internal reserve fund may be unavailable to pay decommissioning costs since it is likely that the licensee in these circumstances will be unable to raise funds against its decommissioning reserve. On this basis, the Commission has taken the position that internal reserve funding of decommissioning costs will be acceptable only when supplemented by further funding support, such as an insurance

MAY 13 1985

DOCKETING & SERVICE BRANCH  
PH

Office of the Secretary  
of the Commission  
May 13, 1985  
Page Two

or surety arrangement. Although not specifically included in the proposed regulations, the Commission concludes in the Supplementary Information that for most electric utilities, the insurance required by Section 50.54(w) will be sufficient to allow use of an internal reserve.

The Commission's conclusion on this score is, we assume, premised on the fact that Section 50.54(w) requires electric utility licensees to maintain a substantial amount of on-site property damage insurance. Indeed, on November 8, 1984 the Commission issued for comment proposed amendments to Section 50.54(w) which, among other things, would fix the required level of property damage coverage at \$1.02 billion (49 Fed. Reg. 44654).<sup>\*</sup> With property insurance coverage of this order of magnitude, it would appear that in the event of an accident-induced premature decommissioning, the licensee would nevertheless have sufficient funds to carry out its decommissioning plan for the facility.

By letter dated February 5, 1985, the Committee submitted comments to the Commission on these proposed amendments to Section 50.54(w). In that letter (a copy of which is attached), the Committee specifically addressed the Commission's proposal to require that nuclear property insurance proceeds be first applied to payment of decontamination expenses before they are used for any other purpose. In that connection, the Committee responded to the concern expressed by the Commission that in the event of a serious accident which threatened the financial viability of the utility, property insurance proceeds might be used to pay the utility's bondholders and other creditors rather than the costs to decontaminate the facility.

The Committee stated in its February 5, 1985 comment letter that the decontamination payment priority suggested by the Commission would not, in the Committee's view, provide

<sup>\*</sup> The comment period for these proposed amendments expired February 6, 1985 and the rulemaking is awaiting Commission action.

Office of the Secretary  
of the Commission  
May 13, 1985  
Page Three

reasonable assurance that property insurance proceeds would be available to decontaminate the facility following a serious accident. We pointed out that were a large scale accident to occur, the utility's bond indenture trustee may well be prohibited by the terms of the indenture from releasing property insurance proceeds to pay for decontamination or debris removal. Instead, the trustee would hold such proceeds for the benefit of the bondholders. Moreover, if the severity of the situation were such that the utility was forced into a bankruptcy reorganization, the Committee expressed concern that the consequences under the Bankruptcy Code were far from certain if the insurance proceeds were paid directly to the utility rather than an external trust fund which presumably would be insulated from the utility's creditors.

Insofar as the operation of the Bankruptcy Code is concerned, it is interesting to note that on February 19, 1985, the U.S. Supreme Court agreed to review the decision of the U.S. Court of Appeals for the Third Circuit in In re Quanta Resources Corp. 739 F.2d 912 (3rd Cir. 1984).<sup>\*</sup> In Quanta Resources, which the Committee discusses in its February 5, 1985 comment letter, the Court of Appeals had held that the Bankruptcy Code did not permit a trustee in bankruptcy to abandon a toxic waste site where abandonment would create a danger to the public health and safety in violation of a state environmental statute.

The Committee does not intend to suggest by these comments that the internal reserve method of funding decommissioning costs, when supported by other sources, does not generally provide reasonable assurance that decommissioning funds will be available when needed. We are concerned, however, that unless the Commission modifies its proposed

D.3.3.3

<sup>\*</sup> Cert. granted sub. nom. O'Neill v. City of New York,  
(No. 84-805) and Midlantic National Bank v. New Jersey  
Department of Environmental Protection (No. 84-801) 53 USLW  
3597, February 19, 1985.

Office of the Secretary  
of the Commission  
May 13, 1985  
Page Four

amendments to Section 50.54(w) along the lines the Committee has recommended in its February 5, 1985 letter, reliance on the availability of nuclear property insurance proceeds to decommission a nuclear power plant following a severe accident may well be misplaced.

D.3.3.3

The Committee appreciates this opportunity to express its views on this matter.

Respectfully submitted,

COMMITTEE ON NUCLEAR TECHNOLOGY AND LAW

By  \_\_\_\_\_  
Douglas E. Davidson, Chair

DED:kag

# Mallinckrodt, Inc.

2703 WAGNER PLACE

MARYLAND HEIGHTS MO 63043

(314) 344-3800

DOCKET NUMBER  
PROPOSED RULE FR-30,40,50 et al  
(50 FR 5600) (65)

May 10, 1985

DOCKETED  
USNRC

'85 MAY 13 P2:03

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
1717 H Street, NW  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Mallinckrodt, Inc. has a broad scope license issued by the NRC to manufacture radiopharmaceuticals at its Maryland Heights, Mo. plant. The proposed rule on decommissioning (50 FR 5600) would potentially effect operations and subsequent decommissioning of our facility. The following comments address the impact the proposed rulemaking would have on our radiopharmaceutical manufacturing operation.

Mallinckrodt feels the effort required to decommission a radiopharmaceutical facility would be substantially less than decommissioning a commercial or research reactor facility. The typical half-life of materials handled at our facility is on the order of hours or days. This makes a short term SAFSTOR option a very viable method. We fully support the NRC in choosing a 120 day half-life criterion for filing a funding plan. We feel the NRC has recognized the relative effort required to decommission a non-fuel cycle material licensee. Due to the relative low cost for decommissioning our facility submission of a funding plan is unnecessary. If a byproduct material licensee were required to submit a funding plan the cost of assuring that decommissioning funds were available, would vary dramatically depending on what methods were chosen.

B.4.5

D.6.1

Mallinckrodt has reviewed the various methods in the proposed rule for funding the decommissioning effort. We are strongly opposed to any funding method requiring prepayment of funds or actual funding of

D.6.4.1.1



MAY 15 1985  
Acknowledged by card .....

pa

Page 2

reserves internally when this capital could be more effectively utilized in business operation. We also feel that self-insurance should be reconsidered by the NRC in light of its acceptance under EPA's RCRA Act (40 CFR 264 and 265). Providing a licensee can meet the financial requirement for self-insurance, this would provide an attractive compliance alternative for corporations with significant financial resources. Option #4 in your proposed funding methods (50 FR 5607) provides the most attractive mechanism to assure that funds are available at the time of decommissioning.

D.6.4.1.1

To summarize, Mallinckrodt feels the 120 day half-life exemption is a prudent decision and will allow for safe and timely decommissioning of byproduct materials facilities. The letter of credit method of funding the decommissioning effort would provide the most cost effective method for our operations. The NRC should maintain several different options of funding in order to allow the licensee to choose the method best suited to their operation. Mallinckrodt would like to thank the NRC for this opportunity to furnish comments on the proposed rulemaking for decommissioning.

D.6.1

D.3.1

D.6.4.1.1

Sincerely yours,



Roy W. Brown, Manager  
Regulatory Commission

PROPOSED RULE 11-30, 40, 50 etc/  
(50 FR 5600) (66)

Iowa Electric Light and Power Company

May 10, 1985

RECEIVED  
NRC

'85 MAY 13 P2:10

Mr. Samuel J. Chilk, Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Secretary Chilk:

RE: Proposed Rule Regarding Decommissioning  
Criteria For Nuclear Facilities, 50 Fed.  
Reg. 5600 (February 11, 1985)

This letter sets forth Iowa Electric Light and Power Company's (Iowa Electric) comments on the Commission's proposed rule on Decommissioning Criteria for Nuclear Facilities, 50 Fed Reg. 5600, February 11, 1985. Iowa Electric holds an NRC power reactor license for the Duane Arnold Energy Center, and, therefore, will be affected by the rules.

Iowa Electric supports the concept of the Commission establishing minimum financial criteria for funding the costs of decommissioning. Iowa Electric believes, however, that the best interests of the public generally would be served if the Commission qualifies the proposed rules to indicate that the \$100,000,000 level is not intended to reflect the actual decommissioning costs of any nuclear facility, but rather is only intended to insure minimum financial responsibility that will not require Commission staff review. These minimum criteria could be analogized to mandatory motor vehicle liability insurance limits which are not intended to fully cover the costs of all possible events. The limits merely set a floor for assuring some financial responsibility.

D.2.1(b)

If the Commission fails to draw this distinction between actual costs and minimum levels of financial responsibility, it will make it only too easy for rate regulatory agencies to seize upon the \$100,000,000 in spite of contradictory evidence. In addition, this distinction will relieve the Commission of continuous review of the \$100,000,000 level to assure that costs have not risen beyond the level established by the escalators. The review will instead, fall upon the rate regulators where there will be an inevitable stream of case by case reviews of the best estimates of the actual costs.

MAY 13 1985

Acknowledged

PR

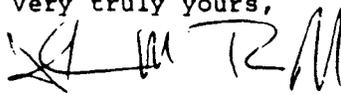
General Office • PO Box 351 • Cedar Rapids, Iowa 52406 • 319/398-4411

Page Two

With this single exception, Iowa Electric applauds the proposed rules as an excellent starting point whose adoption will best serve the interest of the public generally.

| G.1

Very truly yours,

A handwritten signature in black ink, appearing to read 'JMR' followed by a stylized flourish.

Jonathan M. Rogoff  
Senior Attorney

JMR:as

FR-30, 40, 50 et al  
(50 FR 5600) (67)

ORIGINAL

BEFORE THE NUCLEAR  
REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

Decommissioning Criteria )  
for Nuclear Facilities )  
\_\_\_\_\_ )

RECEIVED  
USNRC

'85 MAY 13 A10:47

OFFICE OF THE  
DOCKETING & SERVICE  
BRANCH

COMMENTS OF THE  
CALIFORNIA PUBLIC UTILITIES COMMISSION

JANICE E. KERR  
J. CALVIN SIMPSON  
GRETCHEN DUMAS  
ROBERT CAGEN

5066 State Building  
San Francisco, CA 94102  
(415) 557-0470

May 10, 1985

Attorneys for the Public Utilities  
Commission of the State of California

MAJ 10 1985  
ACCEPTED FOR FILING ..... pd

BEFORE THE NUCLEAR  
REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

Decommissioning Criteria )  
for Nuclear Facilities )  
\_\_\_\_\_ )  
 )

COMMENTS OF THE  
CALIFORNIA PUBLIC UTILITIES COMMISSION

The California Public Utilities Commission ("CPUC") submits these comments on the proposed amendments to the Nuclear Regulatory Commission's (NRC) proposed amendments to its regulations setting forth technical and financial criteria for decommissioning licensed facilities. (10 CFR Parts 30, 40, 50, 51, 70 and 72) The CPUC wishes to thank the NRC and its staff for this opportunity to comment on the proposed amendments.

The CPUC has long been concerned with decommissioning. Like the NRC, the CPUC has sought means to ensure that decommissioning costs would be adequately financed. On April 6, 1983, the CPUC issued D.83-04-013, which orders California utilities to set up external sinking funds to finance decommissioning costs. The proposed amendments approve of this financing method.

The CPUC remains committed to the goal of assured decommissioning financing at the lowest possible cost to ratepayers. The CPUC accordingly supports tax-exempt treatment for decommissioning funds.

D.8.1  
G.1

D.5

Both the federal government and the states have legitimate interests and roles with respect to decommissioning.<sup>1</sup> The suggestions that the CPUC makes are designed to clarify and strengthen those interests and roles, and to further the goal of ensuring a fund for safe and adequate decommissioning at the lowest possible cost to ratepayers.

D.8.3.1

1. The proposed amendments should be expressly made applicable to nuclear plants which were already retired from service when the amendments became effective. Decommissioning issues involving such plants are similar to issues pertaining to plants which will still be operational when the amendments become effective. Health, safety and financial considerations are equally important whether a nuclear plant is new or has been retired from service.

C.9

The intent of the amendments is undoubtedly for them to apply to plants already retired by the effective date of the amendments. This intent should be made explicit, so that there is no possibility of a question being raised on this point at some later time.

---

<sup>1</sup> California believes that while the NRC has a legitimate role in setting decommissioning guidelines, the states have ultimate jurisdiction over the financial issues surrounding decommissioning. (See Pacific Gas & Electric Co. v. State Energy Resources Conservation and Development Commission et al., 461 U.S. 190 (1983))

The CPUC makes this request because the Humboldt nuclear plant, located in Eureka California, has been out of service since 1976 and was retired permanently in 1983. The CPUC wishes to ensure that this facility, and others of its kind, are explicitly covered by the amendments.

C.9

2. The proposed amendments define nuclear facilities as "the site, buildings and contents, and equipment associated with any NRC licensed activity "(Proposed Rules, p.5600). This definition does not further define the meaning of "site". The CPUC believes that a definition would be useful, because "site" is a somewhat ambiguous term. A site may be interpreted to mean hundreds or thousands of acres of land surrounding the building containing the nuclear reactor, and it may also mean auxiliary buildings which have never been exposed to significant radioactivity.

G.22

A definition of site should distinguish between those areas and facilities which are subject to decommissioning rules and those which are not. The proposed amendments should make certain that "site" areas not covered by the rules need not be decontaminated and that they may be returned, with NRC approval, to unrestricted use. If that distinction is made clearly utility ratepayers may benefit by not spending money on unnecessary decommissioning projects and by allowing portions of nuclear sites to return to unrestricted and productive use.

3. The proposed amendments show strong concern that electric utilities be able to assure the NRC that adequate funds will be available to decommission nuclear power facilities. This goal is shared by the CPUC, which has ordered California utilities to set up external sinking funds to finance their decommissioning expenses. The mechanism is one of several approved by the NRC as providing reasonable financial assurance.

D.8.3.1

The proposed amendments refer to the following:

"An electric utility may submit either a proposed decommissioning funding plan or a certification that financial assurance for decommissioning will be provided in an amount at least equal to \$100,000,000 (1984 dollars) adjusted annually for inflation using an inflation rate twice that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics. "(G50.33 (k)(1))

The \$100,000,000 should be carefully explained and qualified. In California, decommissioning expenses for nuclear power plants may substantially exceed \$100,000,000. For example, the Southern California Edison Company has estimated the cost of decommissioning SONGS I as \$122 million in 1985 dollars, and Pacific Gas and Electric Company has estimated the cost of decommissioning Diablo Canyon as \$167 million in 1979 dollars. These figures may increase after further investigation by the CPUC staff or others.

D.2.1.(b)

Accordingly, it should be stressed in the amendments that the \$100 million does not represent the NRC's views as to the maximum

or likely cost of decommissioning a nuclear plant. The proposed amendments should also explicitly state that the \$100 million is not meant to bind regulatory ratemaking bodies to that figure as either a maximum or minimum.

D2.1(b)

4. As the preface to the proposed amendments notes, "[t]axation policies can have a significant effect on the cost of funding alternatives" (P.5608). The CPUC requests that the proposed amendments specify a NRC policy that funds for decommissioning be subject to favorable tax treatment. This is a laudatory policy to promote. Decommissioning expenses should be made as affordable as possible to utility ratepayers who bear the capital costs of nuclear plants.

It should be noted that a NRC statement supporting favorable tax treatment for decommission expenses would not mean support for a position to reduce taxes or revenue from taxes (see legislative history to Tax Reform Act of 1984, Code Sec. 408A, P.L. 98-369). The statement would only demonstrate support for tax treatment and tax law interpretation which avoids serious inequities to ratepayers.

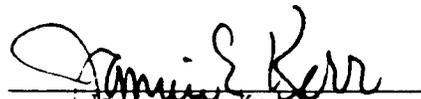
D.5

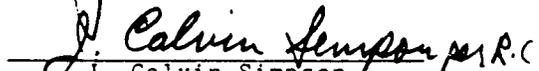
If the NRC decides not to make such a statement, the CPUC requests that it explicitly state that nothing in the proposed amendments is meant to prevent favorable tax treatment for decommissioning. The effect which the amendments will have on tax treatment given to decommissioning expenses is now unknown. The statement of intent is an important precaution to prevent the

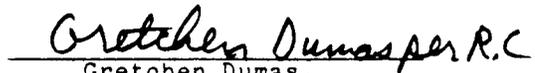
Internal Revenue Service from mistakenly concluding that specific language in the amendments, or the amendments as a whole, evidence a NRC position that decommissioning expenses should not be subject to favorable tax treatment.

D.S

Respectfully submitted,

  
Janice L. Kerr

  
J. Calvin Simpson

  
Gretchen Dumas

  
Robert Cagen

5066 State Building  
San Francisco, CA 94102  
(415) 557-3289

May 10, 1985

Attorneys for the People of  
the State of California and  
the Public Utilities Commission  
of the State of California

DOCKET NUMBER PR-30,40,50 et al  
PROPOSED RULE (50 FR 5600) (68)

1115 E 5TH ST #3  
LONG BEACH CA 90802



SECRETARY OF COMMISSION  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON DC 20535

ATTN: DOCKETING AND SERVICE BRANCH

DEAR SECRETARY:

I'M WRITING TO YOU ABOUT NUCLEAR REACTOR DECOMMISSIONING AND THE REGULATIONS ON DECOMMISSIONING WHICH NRC IS SUPPOSED TO BE DEVELOPING.

THE CURRENTLY PROPOSED RULE HAS A <sup>DO</sup> ~~COUPLE~~ OF SERIOUS PROBLEMS: (1) NO ~~DEFINITION~~ LIMITS ON WHAT IS AN ACCEPTABLE DECOMMISSIONING METHOD. (2) NO ENVIRONMENTAL IMPACT STATEMENT IS REQUIRED. (3) THE ~~SIGNATURE~~ <sup>DOCKETING</sup> ~~REQUIREMENT~~ REQUIRED TO BE RESERVED FOR DECOMMISSIONING IS INADEQUATE. (4) THE ~~DELEGATED~~ <sup>85</sup> DECOMMISSIONING ~~FULLY~~ <sup>MAY 13 3:58</sup> ~~ONLY~~ <sup>OFFICE</sup> ~~REQUIRE~~ <sup>AT THE END OF THE REACTOR'S</sup> ~~DOWNGRADED TO ENVIRONMENTAL ASSESSMENT~~ <sup>DOCKETING & SERVICE</sup> ~~AS~~ <sup>BRANCH</sup> ~~STANDARD~~ <sup>AS STAN</sup>

G.1  
B.3.1.1  
F.1  
D.1.1.1  
D.3.2.2.1

THANK YOU MIKE ANDREWS.

Acknowledged by card MAY 15 1985



PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (69)

# COMMONWEALTH of VIRGINIA

Department of Emergency Services

SNRC

A. E. SLAYTON, JR.  
State Coordinator

310 Turner Road  
Richmond, Virginia 23225-6491  
(804) 323-2899

85 MAY 14 10:35

April 30, 1985

OFFICE OF CLERK  
DOCKETING & SERVICE  
BRANCH

Ms. Sue Weissberg  
Office of State Programs  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Ms. Weissberg:

Representatives of Commonwealth of Virginia State agencies with responsibilities for decommissioning of nuclear power plants have reviewed NRC 10 CFR Parts 30, 40, 50, 51, 70, and 72, Proposed Rule, Decommissioning Criteria for Nuclear Facilities, as requested and have no comments at this time.

G.1

Sincerely,

*Henry G. Allard*  
Henry G. Allard  
State Liaison Officer

HGA/jgl

ACKNOWLEDGED BY CARD..... MAY 15 1985  
*pd*



UNIVERSITY OF MISSOURI

RECEIVED DATE 11-30-40, 50 etal (70)  
(50 FR 5600)

Research Reactor Facility

Research Park  
Columbia, Missouri 65211  
Telephone (314) 882-4211

U.S. NRC  
May 9, 1985

'85 MAY 14 10:57

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Dear Sir:

My remarks are addressed to Decommissioning Criteria for Nuclear Facilities, Federal Register Volume 50, No. 28, pages 5600-5625. Dr. A. Francis DiMeglio, Chairman, TRTR, expressed the views of Test, Research and Training Reactors (TRTR), about this subject in his letter to you of May 7, 1985. I support these views.

I would like to emphasize that the University of Missouri Research Reactor (MURR) and TRTR's are not power reactors and should not be considered as such. Any rules proposed by the Commission should give special thought and consideration to this set of non-power reactors.

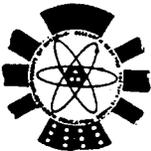
The NRC has the charter to protect the health and safety of the citizens of the nation. I would like to state again that I believe that it provides greater protection of the health and safety of the citizens of the nation to have research reactors operating and effective, rather than to have them shut-down or made ineffective. Additional rules that add more non-productive work and non-productive costs are robbing the research reactors of their resources to be effective research centers. I urge the Commission to consider this view in their deliberations.

G.3.1

Sincerely,

*Robert M. Brugger*  
Robert M. Brugger  
Director

/ctb



COLUMBIA KANSAS CITY ROLLA ST. LOUIS

an equal opportunity institution

Acknowledgment card MAY 1985

J-302

56305 Spruce Road  
Otis, Oregon, 97368

Secretary, Nuclear Regulatory Commission  
Washington, D.C. 20555  
Attention- Docketing and Service Branch

*30, 40, 50 et al*  
*(50 FR 5600) (71)*

Re: Decommissioning Reactors

Dear Sir:

DATE  
NRC

I am concerned over the proposed rule for decommissioning reactors, especially the use of unsegregated decommissioning funds. The utilities should be made to take financial responsibility for the protection of the present and future generations. Unless decommissioning funds are segregated there is no assurance that they will be available at the time for decommissioning, especially in the case of premature shutdown. Current tax deductions should be allowed only for segregated decommissioning funds.

D.3.2.1.1(a)  
D.3.2.2.1  
D.5

The NRC's proposal to substitute an environmental assessment for an EIS as a decommissioning prerequisite is unacceptable as the process has significant effect on the environment and must be subject to public comment. Decommissioning costs should be included in the EIS prepared at the time of construction license as well as when a utility submits its plan to the NRC.

F.1  
F.2

Reaction wastes must be carefully reclassified to exclude long-life products from low-level radioactive land fills. Although the NRC suggests a 30-50 year limit for temporary storage prior to dismantlement, this should be mandated of the utilities. Chemical decontamination wastes should be excluded from low level waste burial until research studies prove them to be absolutely safe.

H.1.1.1  
B.4.3  
H.1.2.1

Utility liability for decommissioning costs should be strengthened through legislation, including repeal of the Price-Anderson liability limit.

D.8.2.1

The NRC should explicitly prohibit entombment as a decommissioning method in keeping with the proposed rule requiring release of the property to unrestricted use.

B.5

Finally, the present maximum permissible level of radiation exposure to nuclear workers is much too high. A worker registry should be established to monitor radiation exposures for all reactor workers. The commission should propose a maximum radiation level of 10 millirems full body dose at plants released for unrestricted use.

H.3  
C.1.10  
E.1.1

Sincerely,



Russell M. Maynard M.D.

APPROVED FOR SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_ pd



PROPOSED RULE 11-30, 40, 50 et al  
(50 FR 5600) (72)

# THE CONSERVATION COUNCIL OF NORTH CAROLINA

307 Granville Road, Chapel Hill, N.C. 27514  
(919) 942-7935 or 942-1080 (24 hours)

DOCKETING  
USNSC

May 18 1985 11:03

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
US Nuclear Regulatory Commission  
Washington, D. C. 20555  
Attention: Docketing & Service Branch

Re: Comments on Decommissioning Criteria for Nuclear Facilities  
Notice at 50 Fed. Reg. 5600 (February 11, 1985)

Dear Sirs:

The Conservation Council of North Carolina has intervened in the licensing processes of nuclear power plants in North Carolina, currently the Shearon Harris Nuclear Power Plant proposed by Carolina Power & Light. We are concerned that the decommissioning of this plant, and all nuclear power plants, has not been given adequate attention and careful consideration. We commend the Nuclear Regulatory Commission in beginning to regulate the decommissioning process, but urge the Commission to consider the following in promulgating the final rule:

G.1

1. The cost estimate of \$100 million ('84 dollars) appears to be based on old data and without the cost experience we have gained through decommissioning parts of TMI, the Dresden-I plant, and other plants. Pacific Gas & Electric recently estimated that decommissioning of the small Humboldt reactor would cost \$600 million (in inflated dollars) by 2015. The cost estimates made recently by the various utilities have been extremely varied.

D.1.1.1

2. The cost estimate of \$100 million will need revision periodically as experience is gained in decommissioning existing plants, such as the Shippingport unit, and in further decontamination efforts. Until different decommissioning methods are used in practice, especially with full size reactors (in the 800 MW-plus range), a final figure for decommissioning cannot be firmly established.

D.2.1(a)

3. Safe decommissioning with allowable worker exposure levels kept as low as reasonably achievable will greatly add to the labor costs. Various researchers and government agencies have recommended that worker exposure levels be decreased, especially as data from long-term studies comes in. (See for example the work done on residents around the Nevada test sites and the so-called "atomic veterans").

D.1.1.1

1  
MAY 23 1985  
pd

4. Decommissioning funds must be kept separate from the utility's general operating funds in order to be protected from depletion. In times of financial adversity, the utility with support from a sympathetic public utility commission might "borrow" from the decommissioning funds in order to pay current expenses. It is also increasingly likely that an utility may become bankrupt and decommissioning funds must as a result be protected from creditors.

D.3.2.1.1(a)

5. The proposed rule appears not to have distinguished between the numerous alternatives for decommissioning. Different methods involve different costs, both financial and risk to workers.

B.3.1.1

6. The final rule should include specific standards for decommissioning, such as requirements to minimize exposure to workers and the public, strict reporting of all phases to the NRC, and additions to Part 50 Appendix B for Quality Assurance/Quality Control throughout the process. It is not unreasonable to require a decommissioning license, such as the construction permit and operating license, which specifically addresses the utility's proposed plan for decommissioning and requiring NRC approval in a formal manner.

C.1.3  
C.1.8  
C.6

C.1.3.1

7. We question the rationale for exempting any reactor from the final decommissioning rule. An exemption could be formally granted if a utility could prove undue hardship or extreme circumstances; this request would allow the Commission more control of the entire decommissioning process.

G.6.2

8. The 1981 Draft Generic Environmental Impact Statement which the Commission appears to rely on in developing the proposed rule is of course a draft EIS and has never been finalized. The information contained in that document is at a minimum five years out of date and as a result could not have considered new information, especially experiential data about decontaminating nuclear power plants. It also does not consider the cumulative impacts from decommissioning all of the currently operating power plants and the safe permanent storage of all high and low-level radioactive waste.

G.5

Thank you for your consideration. Please inform us of any further action or study you make on this important issue.

Respectfully submitted,



John Runkle  
General Counsel  
Conservation Council of NC

PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (73)

**AMERICAN ELECTRIC POWER Service Corporation**



1 Riverside Plaza (614) 223-1000  
P.O. Box 16631  
Columbus, Ohio 43216-6631

Writer's Direct Dial No.

614/223-1622\*85 MAY 14 P12:22

May 13, 1985

DOCKETED  
USNRC

OFFICE OF  
DOCKETING & SERVICE  
BRANCH

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JEFFREY D. CROSS  
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ATTORNEYS

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
Attention: Docketing and Service Branch

Re: Decommissioning Criteria for Nuclear Facilities:  
50 Fed. Reg. 5600, February 11, 1985

Gentlemen:

This letter responds to your request for comments on proposed amendments to your regulations that would set forth technical and financial criteria for decommissioning licensed facilities. These comments are submitted on behalf of Indiana & Michigan Electric Company (IMECo), which owns and operates the Donald C. Cook Nuclear Plant. The Cook Plant has two nuclear units with a combined rating of 2,130 megawatts.

IMECo shares the Commission's concern about assuring that the decommissioning will be accomplished in a safe and timely manner and that adequate licensee funds will be available for this purpose. The following comments are made in the interest of strengthening and/or clarifying the proposed amendments:

D.8.1  
G.1

1. Decommissioning Funds

- a. We have no basis for disagreeing with the \$100 million except that it would be helpful to add detail supporting the reasonableness of this as a generic estimate of actual decommissioning costs.

D.2.1(b)

MAY 13 1985

Approved and sent by mail.....

In lieu of generic standards, IMECO has presented testimony before certain regulatory commissions as to its preferred method of decommissioning and estimated cost. The Commission's rule should clearly state that if a licensee site-specific cost estimate for decommissioning is available, it should be used in lieu of the \$100 million figure. We also recommend clarifying whether the \$100 million is per unit or per plant (which may have more than one unit.) If per unit, then some consideration should be given to requiring less than \$100 million per unit at a plant having more than one unit on the assumption that the units will be decommissioned in the same time frame, resulting in a more efficient, less costly program.

D2.1(b)

- b. We are concerned with what we perceive to be a problem in timing. In order to obtain NRC approval of a funding plan, it is assumed that a utility must select the decommissioning method. Otherwise, it will not be possible to estimate costs for the plan. Yet, the Commission's guidance on critical issues such as timing and acceptable levels of residual radioactivity for release of property for unrestricted use will not be available until some later, unspecified date. Accordingly, the two-year period during which a plan is to be prepared may not be long enough. We urge the Commission to issue as soon as possible all of the technical criteria by which a decommissioning funding plan will be judged.

B.3.1.1

E.1.1

D.4.1.1

D2.1(c)

## 2. Funding Methods

We think that of the four methods proposed, the external sinking fund and internal reserve will receive the most attention. We favor the external fund because of the assurance of its continued availability for the purpose of decommissioning. The internal reserve can be highly risky from an assurance viewpoint. It should be limited to those cases where the liability is small in relation to the company, the company has a strong financial position, and the relevant state commission has a demonstrated history of preserving the financial strength of all regulated companies within its jurisdiction.

D.3.2.1.2

## 3. Existing Licenses

- a. The section on Existing Licenses at page 5608 highlights the need, as noted in our earlier comment, for the Commission to identify very soon

D2.1(c)

Secretary of the Commission  
May 13, 1985  
Page 3.

the criteria for approving funding plans. Included in this section is an apparent criterion which says the period of time for building to the acceptable funding level is 5 years or one-third of the remaining license period, whichever is greater. This criterion, however, is not stated in the proposed amendment. Is it a condition of approval of a plan?

D2.1(c)

b. The following questions should be answered:

1. Does the "catch-up" requirement apply to electric utilities? The text (see line 19, third column, page 5608) implies that the presence of the Section 50.54(w) insurance for electric utilities eliminates the need for the catch-up.
2. What is an "adequate decommissioning fund"? The projected costs of decommissioning or the level that would have been attained if funds had been accumulated from the beginning of facility life?

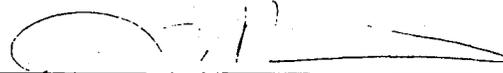
D.4.6.1

We appreciate the opportunity to provide comments on the proposed amendments.

Respectfully submitted,

Indiana & Michigan Electric Company

By

  
John B. Shinnock  
Assistant General Counsel  
American Electric Power  
Service Corporation

JBS/lb

May 16, 1985

DOCKETING  
USNRC

TO RECEIPIENTS OF PR-30,40,50, et al (50 FR 5600) Decommissioning  
Criteria for Nuclear Facilities

'85 MAY 16 P1:25

Please disregard Comment No. 74. It is a duplicate of Comment No. 51. No. 74 will not be used again.

DOCKETING & SERVICE  
BRANCH

Docketing and Service Branch  
Office of the Secretary  
of the Commission

PROCESSED FILE # R-30,40,50 etal (74)  
(50 FR 5600)

CONCERNED CITIZENS  
FOR SNEC SAFETY  
c/o James H. Elder  
Wall St Ext  
Saxton, Pa 16678  
May 6, 1985

Secretary of the Commission  
US Nuclear Regulatory Commission  
Washington, DC 20555

DOCKETED  
USNRC

'85 MAY 14 P3:21

Attention: Docketing and Services Branch

Re: Decommissioning Criteria for Nuclear Facilities  
50 Fed. Reg. 5600, February 1, 1985

Concerned Citizens for SNEC Safety is an organization which has been involved in representing local residents as regards the Saxton Nuclear Experimental Corporation's reactor during its dismantlement phase. Therefore we have a very personal stake in the NRC's regulations in this area. We have researched the problems involved in dismantlement carefully so that we can help local residents protect themselves from possible harm.

After studying the proposed rule for decommissioning we have concluded that it contains several serious flaws. It is surprising that a rule which has been worked on since 1977 is so lacking in specifics on the topic it addresses. The rule must be drastically modified to become an adequate framework for the decommissioning process. We will address this problem using the real experience of what has occurred at Saxton, where the plant was partially decommissioned in 1973 and then put into storage for eventual dismantlement.

The decision to change the present requirement for a full Environmental Impact Statement when a final decommissioning plan is developed and to substitute a review is not acceptable. The change in knowledge and techniques during the life of a reactor is considerable and there are certain to be vast differences between the original planning and the actual site-specific situation after 30 or 40 years. This is clearly the case at Saxton only 12 years after its initial decommissioning plan was developed.

In addition, the preparation of a full Environmental Impact Statement is the only guarantee that the site-specific knowledge of local government officials and citizens will be made a part of the plan which is carried out. It is important that the views of those most affected by decommissioning decisions, the local residents and workers, be made a part of the final plans.

See  
Comment  
Letter  
No. 51

ACKNOWLEDGED BY: MAY 15 1985  
pd

The prime consideration in decommissioning decisions must be public health and safety since that is the legal mandate of the NRC. The proposed rule appears to give only lip service to this requirement. It is mentioned, but nowhere are methods or performance goals for achieving safe decommissioning written into the rule. Instead, this topic is left for later action by the NRC, when it should be the real substance of this rule.

One of the most important decisions in decommissioning is whether to use DECON (immediate dismantlement), SAFSTOR (temporary storage with later dismantlement) or ENTOMB (permanent on-site storage). Yet there is no criteria given in the rule for how to make the choice among these options. Even the information supplied with the rule makes a clear case for how to evaluate these options, but the rule itself gives no guidance.

ENTOMB is not a realistic alternative and the rule should state that. There will obviously be special reasons at particular sites to choose the DECON option because of reasons such as poor original siting of a reactor, but in general the evidence suggests that partial decommissioning followed by a 50-year storage period (SAFSTOR) will be the best option in terms of the public health and safety. Radiation exposure to workers and the surrounding area will be lower and, equally as important, there will be a significant reduction in the radioactive wastes produced.

While SAFSTOR might slightly increase the total cost of decommissioning, the public benefits justify that cost. The rule should require that the choice of method be based on a detailed assessment of the effects on public health and safety so that a rational decision can be made. There should be clear criteria available for NRC review of that decision. Again the need for preparation of a full Environmental Impact Statement as part of a final site-specific plan is shown to be justified.

Another extremely important part of the decommissioning process is not addressed by the rule at all. Proper requirements for quality assurance and quality control during decommissioning are essential, including adequate monitoring by the NRC itself. This need is very apparent at Saxton. The original work in 1973 was supposed to have cleared up several auxiliary buildings for unrestricted use. The AEC did not inspect for 13 months while work progressed. When an inspection finally occurred it was discovered that the buildings remained contaminated. Since the owner (General Public Utilities) had already dispersed its workers, those

See  
Comment  
Letter  
No. 51

buildings remain contaminated today. Strict requirements for quality assurance must be a part of the rule.

We cannot understand why the rule specifically excludes from its requirements reactors which have already been permanently shut down. Saxton falls into this category and we think we should receive as much protection as anyone else who lives near a reactor.

The experience at Saxton also casts severe doubt on the adequacy of the proposed rule for estimating the costs of decommissioning. In 1973 GPU estimated that the total decommissioning cost, excluding continued maintenance for SAFSTOR of the plant, would be \$575,000. Even after the initial decontamination work had been done, in 1983 GPU's minimum estimate of the cost for the remaining work was \$12,454,000 or more than 21 times the original total estimate. Obviously not all of this increase was due to inflation. Saxton is only a 35 thermal megawatt reactor and GPU's cost estimates assume the reactor vessel can be removed in one piece. To think that \$100,000,000 is a maximum figure for decommissioning plants 300 to 400 times the size of Saxton is unrealistic.

The proposed rule should be changed to require a decommissioning fund equal to the best estimate possible for the cost of decommissioning a particular site, and that estimate should be revised every five years so that an appropriate fund can be built up. Otherwise when the time comes to actually decommission a plant only a fraction of the funds required may be available.

The experience of GPU in approaching bankruptcy, with its main assets being inoperable nuclear plants, indicates why the set-aside funding for future decommissioning must be in external sinking funds which are legally separate from a utility's other assets. GPU has not been able to get a blank check from Pennsylvania ratepayers even in its emergency situation and therefore its cleanup at TMI-2 has been delayed. If the funds it had set aside for future decommissioning were part of its normal assets there would be no money available today for work at Saxton. We appreciate the fact that the Pennsylvania Public Utility Commission requires external reserves for decommissioning funds and the NRC should require the same method, along with insurance to provide funding in case of the early retirement of a plant such as happened at TMI-2.

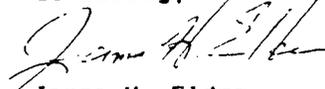
The definition given for the term "decommissioning" is not complete in the proposed rule. Since the objective of

See  
Comment  
Letter  
No. 51

decommissioning is to return a site to the same possibilities of use that the site possessed before a reactor was built on it, the definition should include language stating that the limit for residual radioactivity remaining should be the amount of natural background radiation at the site before construction of the plant. This is the only definition which can be acceptable by local residents whose children will be using the site in the future.

To summarize, the proposed rule is not complete since it does not provide specific criteria for making decisions about decommissioning and it leaves out several important topics. The rule should be redrafted and again submitted for public comment before it is accepted by the NRC.

Sincerely,



James H. Elder  
Chairman

See  
Comment  
Letter  
No. 51

**The Light  
company**

Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

PROJECT NUMBER  
PROPOSED RULE PR-30, 40, 50 et al  
(50 FR 5600) (15)

DESKETER  
USNRC

May 13, 1985

'85 MAY 15 P12:01

ST-HL-AE-1252  
File No.: G3.15

OFFICE OF SECRETARY  
GOVERNING & SERVICE  
BRANCH

Mr. Samuel J. Chilk  
Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Dear Mr. Chilk:

Proposed Rule on Decommissioning Criteria  
for Nuclear Facilities

Houston Lighting and Power Company is pleased to submit the following comments on the NRC's proposed rule, "Decommissioning Criteria for Nuclear Facilities", which was published in the Federal Register on Monday, February 11, 1985.

We have reviewed and endorse the comments on the proposed rule which were submitted by the Atomic Industrial Forum's (AIF) Subcommittee on Decommissioning. We especially endorse the AIF's comments relative to the inflation rate to be used to update decommissioning cost estimates; the removal of the funding aspects of decommissioning from license conditions; and the use of a specific dollar amount of \$100 million in the regulation as an appropriate estimate of plant decommissioning costs.

D.2.1(a)  
D.4.4  
D.2.1(a)

We believe that an annual adjustment of the decommissioning cost estimate by twice the Consumer Price Index to account for inflation is not equitable in view of the current economic climate. An annual inflation rate equal to the Consumer Price Index would be appropriate.

D.2.1(a)  
D.2.1(b)

Removing the funding aspects of decommissioning from the conditions of operating licenses in 10CFR50.54 will eliminate the possibility of litigating the decommissioning cost estimate in operating license hearings and remove uncertainties associated with the operating license in the event that unique requirements on the funding method were mandated by state public utility commissions.

D.4.4

The proposed rule under new 10CFR50.33(k)(1) requires either a site specific decommissioning plan or a certification that financial assurance for decommissioning be provided in an amount at least equal to \$100

D.2.1(a)

W2/NRC3/d

May 13 1985  
Acknowledged by card.....  
pd

million (1984 dollars). This optional generic cost approach should be removed from the final rule. The \$100 million estimate of decommissioning costs is based on a nonexistent power plant. It does not take into account such things as size, design, location, or future decommissioning technology changes. We believe that few, if any, licensees would use this generic approach in lieu of developing a plant specific plan with associated costs. The danger in using a specific cost number in the final rule is that state public utility commissions will use it as a "rule of thumb" by which all plants will be measured. Variances from this amount would have to be explained and documented. The explanation will be extremely difficult since the base case is a nonexistent power plant.

D2.1(a)

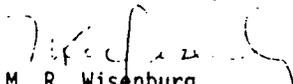
As a near term operating license applicant, Houston Lighting and Power Company is concerned with a potential inconsistency relative to the implementation requirements of the proposed rule. As we understand the proposed rule, each holder of an operating license obtained prior to the expiration of the two-year period after the effective date of the final rule has until the end of that two-year period to submit a decommissioning plan for the NRC's approval (proposed 10CFR50.54(cc)-(92)). Each holder of an operating license issued after that two-year period would be required to provide financial assurance, apparently immediately (proposed 10CFR50.54(cc)(1)).

D.4.1.2

We are concerned about the provisions of the rule relating to pending applications for operating licenses. Proposed 10CFR50.33(k)(1) provides that each application for an operating license must contain information providing reasonable assurance that funds will be available to decommission the facility. An applicant may submit either a proposed plant-specific decommissioning funding plan or a "certification" that financial assurance for decommissioning will be provided.

Unlike proposed 10CFR50.54(cc)(1) and (2), proposed 10CFR50.33(k)-(1) contains no provision for delayed effectiveness. Consequently unless the proposed rule is modified, applications for operating licenses still pending when the rule becomes effective will have to be amended. More important, the potential for the introduction of new contentions - and therefore for delay - in operating license hearings would be substantial.

Sincerely yours,

  
M. R. Wisenburg  
Manager, Nuclear Licensing

MRW/yd

W2/NRC3/d

Houston Lighting & Power Company

ST-HL-AE-1252  
File No.: G3.15  
Page 3

cc: J. H. Goldberg  
J. G. Dewease  
J. T. Westermeier  
W. D. Kovach  
STP RMS

W2/NRC3/d

J-316



E. I. DU PONT DE NEMOURS & CO. (INC).  
BIOMEDICAL PRODUCTS DEPARTMENT

PROPOSED RULE 1.1-30,46,50 et al  
(50 FR 5600) (76)

SECRET  
USNRC

May 8, 1985

'85 MAY 15 11:58

Secretary of the Commission  
USNRC  
Washington, DC 20555

OFFICE OF THE  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES

Proposed Rule published in the Federal Register/Vo. 50 #28/  
Monday, February 11, 1985, Pages 5600-5625.

On behalf of the Biomedical Products Department,  
E. I. duPont de Nemours and Company, we are pleased to  
submit the following comments on the above referred  
subject.

Sincerely,

L. R. Smith  
Senior Radiological Consultant  
Safety & External Affairs Dept.

LRS/kes

Encl.

NEN PRODUCTS  
331 Treble Cove Road, No. Billerica, MA 01862 Telephone 617-667-9531 Telex 94-0996

1.1-30,46,50 et al  
LRS/kes

COMMENT ON PROPOSED RULE ON  
DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES

We recognize the need for major users of unsealed sources of radioactivity to have the financial capability of decommissioning facilities.

D. 8.1

It is not clear in the proposed regulations whether financial assurance requirements apply to each license, each licensee or each facility. The unit requiring demonstration of financial assurance should be clarified. Unnecessary duplication can be avoided by specifying that the licensee be the responsible unit.

D. 6.2

The finalization of decommissioning plans and cost estimates depend upon access to waste disposal facilities and stable waste disposal costs. The availability and cost of disposal is uncertain after January 1986. Furthermore, there are currently no acceptable disposal options available for several kinds of waste held by licensees. It is clear that the planning requirements of the proposed decommissioning rule cannot be implemented until these disposal issues have been resolved. To prevent the uncertainty of waste disposal costs from being used to challenge the decommissioning process, we recommend that the USNRC specifically states in these regulations that the cost and means of waste disposal be excluded from decommissioning plans and demonstration of financial assurance.

G. 4

The proposed rule requires the maintenance of a separate set of records for decommissioning purposes. These records would duplicate those already required by 10 CFR 20 and other regulations. We recommend that this proposed duplication be removed.

C. 7.1

In addition to the above comments we also endorse comments submitted to the USNRC by the Atomic Industrial Forum Committee on Radionuclides and Radiopharmaceuticals.

**CP&L**

Carolina Power & Light Company

PROPOSED RULE 1 R-30,40,50 et al  
(50 FR 5600) 77

MAY 13 1985

SERIAL: NLS-85-165

Mr. Samuel J. Chilk, Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

RECEIVED  
USNRC

85 MAY 15 11:58

Attention: Docketing and Service Branch  
Room 1121, 1717 H Street, NW  
Washington, DC 20555

OFFICE OF THE SECRETARY  
DOCKETING & SERVICE  
BRANCH

Subject: Proposed Rule Regarding Decommissioning  
Criteria for Nuclear Facilities  
(50 FR 5600, February 11, 1985)

Dear Mr. Chilk:

Carolina Power & Light Company appreciates the opportunity to comment on the proposed rule, *Decommissioning Criteria for Nuclear Facilities*, 50 FR 5600, February 11, 1985. We have followed the developments on this issue since 1978 (Advance Notice of Proposed Rulemaking, 48 FR 10370) and are active members of the Utility Decommissioning Group.

We fully endorse the comments submitted by the Utility Decommissioning Group. We believe that they present the industry's view.

In our judgement, the rule should not require financial assurance for electric utilities. The rate and financial review by state utility commissions and the value of assets held by utilities provide reasonable assurance of adequate decommissioning funding.

D.8.1

We also consider that the Commission should not require the \$100 million certification. State utility commissions may use this figure to establish decommissioning funding ceilings in rate cases in spite of the fact that actual costs may be larger. Thus, the certification may inhibit the ability to recover the actual cost of decommissioning.

D.2.1(a)

If you have any questions with regard to our position, please contact Mr. Pedro Salas at (919) 836-8015.

Yours very truly,

S. R. Zimmerman  
Manager

Nuclear Licensing Section

PS/pgp (1488PSA)

411 Fayetteville Street • P. O. Box 1170 • Raleigh, NC 27602

ACKNOWLEDGEMENT BY OFFICE OF THE SECRETARY OF THE U.S. NUCLEAR REGULATORY COMMISSION

PROPOSED RULE: 10 CFR 30.40, 50 et al  
(50 FR 5600) (B)

BEDFORD COUNTY ENVIRONMENTAL  
COMMITTEE

c/o Christi Kutz  
Star Rt 4 Box 111  
Everett, Pa 15537  
May 9, 1985

Secretary of the Commission  
US Nuclear Regulatory Commission  
Washington, DC 20555

DOCKETING  
BRANCH

Attention: Docketing and Services Branch

'85 MAY 15 11:57

Re: Decommissioning Criteria for Nuclear Facilities  
50 Fed. Reg. 5600, February 11, 1985

DOCKETING & SERVICE  
BRANCH

The Bedford County Environmental Committee has studied the proposed rule and finds it inadequate to fulfill its stated purpose. Basically the rule is just too vague in many areas and does not provide specific criteria by which decisions about decommissioning can be made.

G.1

First, it is unrealistic not to require a full Environmental Impact Statement as part of the final decommissioning plan for facilities. During the 30 to 40 year time between the original EIS and the closing of a facility there are certain to be significant changes in knowledge and methods of work. In addition, the site situation itself is bound to be very different. Without a full EIS the public will not be able to add its site-specific knowledge to the plan which is carried out.

F.1

Second, the very important decision of whether to use DECON, SAFSTOR, or ENTOMB as the method of decommissioning is left up in the air. There are no criteria given in the rule for how to make the choice among these options. The information supplied with the rule makes a clear case for how to make the evaluation, but the rule itself gives no guidance.

B.3.1.1

ENTOMB is not a realistic alternative and the rule should make that clear. In general the evidence suggests that partial decommissioning followed by a 50-year storage period (SAFSTOR) will be the best option in terms of public health and safety. Radiation exposure to workers and the surrounding area will be lower and, equally important, there will be a significant reduction in the radioactive wastes produced. Of course there may be site-specific reasons to choose DECON in some cases where that option will better promote public or worker safety. The rule should require that the choice of method be based on a detailed assessment of the effects on public health and safety so that a rational decision can be made. There

B.5

B.4.2

B.3.1.1

C.1.3

Acknowledged by ..... MAY 15 1985

pd

should be clear criteria available for NRC review of that decision. Again, preparation of a full Environmental Impact Statement as part of a final site-specific plan is greatly needed.

C.1.3  
F.1

Third, nowhere are methods or performance goals for achieving safe decommissioning written into the rule. Instead, this topic is left for later action by the NRC, when it should be the real content of this rule. The public health and safety should be the prime consideration in decisions about decommissioning--that is the NRC's legal mission, yet this rule lacks any specifics on this issue.

E.1.1

Fourth, an important part of the decommissioning process is not addressed by the rule at all. Proper requirements for quality assurance and quality control during decommissioning are essential, including adequate monitoring by the NRC itself.

C.6

Fifth, there is no good reason for the rule specifically to exclude reactors which have been permanently shut down. Bedford County has such a reactor and we think we deserve as much protection as anyone else.

C.9

Sixth, the proposed rule should require a decommissioning fund equal to the best estimate possible for the cost of decommissioning a particular site, and that estimate should be revised every five years so that an appropriate fund can be built up. Otherwise when the time comes to actually decommission a plant only a fraction of the funds required may be available. It is inappropriate for the NRC to set an upper limit of \$100,000,000 when specific plants may well require higher funding. The rule's invitation to utilities to request lower funding levels based on site-specific needs must be balanced by a requirement that needs greater than \$100,000,000 also be funded.

D.2.1(a)

D.4.3

D.2.1(a)

Seventh, set-aside funding for future decommissioning must be in external sinking funds which are legally separate from a utility's other assets. GPU's precarious financial situation is a case in point. If the funds it had set aside for future decommissioning were part of its regular assets there would be no money available today. The Pennsylvania Public Utility Commission's approach requires external reserves for decommissioning funds and the NRC should require the same method, along with insurance to provide funding in case of the early

D.3.2.1.1(a)

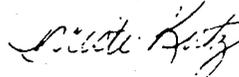
D.3.2.2.1

retirement of a plant such as happened at TMI-2.

Finally, the definition given for the term "decommissioning" is not sufficient in the proposed rule. The objective of decommissioning is to return a site to the same possibilities of use that the site possessed before a facility was built on it. The definition should include language stating that the limit for residual radioactivity remaining should be the amount of natural background radiation at the site before construction of the facility. This is the only definition which is acceptable to residents whose children will be using the site in the future.

In summary, the proposed rule is incomplete since it does not provide specific criteria for making decisions about decommissioning and it leaves out several important topics. It does not provide adequate protection for public health and safety in terms of complete planning or funding for decommissioning. The rule should be redrafted and again submitted for public comment before it is accepted by the NRC.

Sincerely,



Christi Kutz  
President

D.3.2.2.1

B.1.3

E.1.1

G.1

-30,40,50 etc/ (50 FR 5600) 79

'85 MAY 15 AM 11:17

May 10, 1985

OFFICE OF  
REGULATORY & SAFETY  
BRANCH

Dear Commission:

Most of the following comments refer to #50 Fed. Reg. Feb. 11, 1985. The N.R.C. has functioned and helped maintain a standard for the industry without which I would feel less safe and worse than I feel now. The time has come to retire some of our older nuclear plants and it would be extremely foolhearty to relax rulings and regulations on decommissioning our nuclear neighbors. Left to their own self-regulation utility companies could and would not manage the great task of decommissioning hot plants.

G.1

They must have strict rules forcing them to do so.

- + Strict rules are needed for worker exposure which will increase 1000 fold when the highly radioactive power plants are taken apart.
  - + Strict rules are needed to insure proper packageing and correct buriel of the high level waste.
  - + Strict rules are needed to insure proper methods of cutting up and removing the nuclear plant components.
  - + And of course strict rules are needed to insure adequate funds to cover the costs of decommissioning. The proposed guideline estimates a cost of \$100 million to decon an average nuclear plant. This is based on a study in 1978 by Battelle Pacific Northwest Laboratory. It seems highly unrealistic a figure.
- In the June 1985 Science digest an article appeared on page 54, it is on Three Mile Island and the estimate for the cleanup and the decon for Unit 2 is a billion dollars. Even at that price I am sure we will not see the Unit 2 facility cut up and safely buried. The only way to insure adequate funds is Prepayment by the utility. This should be a separate account and an adequate one, so if the utility goes bankrupt the decon can still safely occur. I feel strongly that the government should share in these costs as it is and has been the government that has led the utilities down the nuclear path.

C.1.8.1

C.1.13

C.1.11

D.8.1

D.1.1.1

D.3.2.2.1

D.3.2.1.1(a)

D.8.2.2

Please do not assume that the utilities will follow basic safety criteria when carrying out the decommissioning. Instead make strong rules spelling out all essential safety practices and the ways the utility will meet these requirements.

C.1.3

pd

page 2

I have lived 10 years within the 10 mile zone of the Indian Point Nuclear Power Plant in Buchanan, New York. I have regreted my choice of my home since I became aware of the Nuclear Industry and its workings in 1974.

H.2

The Nuclear Industry has had its day and the many nuclear plants that are old will be closing down. At the end of the cycle the plants are more dangerous then at any time in their lives, having absorbed radioactivity for years on end. They are much more dangerous then most citizens can imagine.

C.1.3

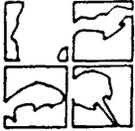
It is your profound duty to insure the safest possible rules to erase this industry from our planet and our lives.

G.1

Sincerely

  
Dale Saltzman

Dale Saltzman  
3091 Hickory St.  
Yorktown Heights, N.Y. 10598



SAPL

Seacoast Anti-Pollution League  
5 Market St., Portsmouth, N.H. 03801

DOCKET NUMBER  
PROPOSED RULE PR-30,465 et al /  
(50 FR 5600) (80)  
(603) 431-5089

May 10, 1985

DOCKETED  
USNRC

'85 MAY 15 11:12

OFFICE OF THE  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn: Docketing and Service Branch

Dear Sir:

I am writing to make comment on the proposed rule entitled "Decommissioning Criteria for Nuclear Facilities" at 50 Federal Register 5600, February 11, 1985. Unfortunately this proposed rulemaking escaped the Seacoast Anti-Pollution League's attention until very recently and therefore this comment has not been prepared to address every point which ought to be addressed, but rather will focus on a few points of major importance. SAPL's commentary will be confined to the issues raised by the decommissioning of power reactors only, though SAPL realizes that this rule is intended to affect all nuclear facilities' decommissioning.

Decommissioning is a subject matter which should have been addressed, and for which standards and criteria should have been set, before the first power reactor was ever licensed in this country. The landscape is now dotted with sites that will pose significant hazards for public health and safety if decommissioning of a full scale power reactor should turn out to be a failing proposition. We are faced with the ineluctable consequence that we have to do the best that is humanly achievable in preventing the sites of abandoned reactors from harming the public. This is a process that will require extraordinary care and very large amounts of money. The instant rulemaking is insufficiently drafted to ensure that either appropriate care will be taken or sufficient funds available to do the job of decommissioning.

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DEFINITION

The very first task that needs to be addressed by the Commission is the task of defining what a decommissioned site is, and that means defining the level to which residual radioactivity

E.2

Founded 1969

Acknowledged by card

MAY 17 1985 *pd*

must be reduced in order to release property for unrestricted use. The Commission is fooling itself in trying to draft a meaningful decommissioning rule without facing this very difficult problem head-on. Costs cannot be accurately estimated or specific enough criteria set until the Commission determines precisely what it means by a decommissioned site. It is not in the public interest to leave the matter of the definition of a decommissioned site to the discretion of the utilities. This rulemaking should not proceed until this most important matter of definition has been squarely addressed, whether that be in a separate rulemaking action amending 10 CFR Part 20, as referred to at 50 Federal Register 5600 column 3, or as part of this rulemaking. (It would probably make the most sense and be most clear if the Commission were to establish a new regulatory section governing decommissioning of power plants and deal with all matters related to decommissioning in one comprehensive treatment.)

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#### FUNDING

The issue of ensuring that adequate funding for decommissioning is available is an exceedingly important one. In New Hampshire, where the state's largest public utility barely escaped bankruptcy in 1984, envisioning the possibility of a utility reorganizing under Chapter 11 of the Federal Bankruptcy Code at the point when the plant stops generating revenue is not very difficult. It is not clear whether a bankruptcy court would find that decommissioning should be funded. Particularly if no immediate danger were posed to the public health and safety, the court might find in the favor of the creditors that funding should not be provided, since preservation of the assets of the creditors is the bankruptcy court's primary concern. In view of this tremendous uncertainty, any decommissioning funding requirements ought to provide a hedge against this sort of eventuality.

D.3.2.1.1(a)

Internal unsegregated funds should not even be held out by the NRC as an option, as at 50 Federal Register 5607. It is too possible that something could happen to divert those funds to other purposes, especially in the case of a financially troubled utility. As you may know, SAPL has taken the position consistently that financially troubled utilities should not be issued operating licenses. If the Commission were to act in accord with that suggested policy, some of the risk might be obviated. However, in principle, SAPL believes it contrary to the public interest to allow any funding mechanism which does not absolutely ensure that adequate funding will be available at the time when needed. Only no risk funding mechanisms should be allowed.

One acceptable mechanism would be the prepayment of decommissioning costs with the funds to be held in a segregated account that is overseen by some governmental entity in addition to the

D.3.2.2.2

utility. Another acceptable mechanism would appear to be an external sinking fund, but only if that is coupled with premature shutdown insurance and again overseen by some governmental entity in addition to the utility.

D.3.2.2.1

On the issue of level of funding, the proposed rule requires utilities to set aside a decommissioning fund of at least \$100 million unless the utility submits a facility-specific cost estimate submitted as part of a "decommissioning funding plan". The \$100 million estimate is doubtless going to be too low, and to allow a utility to come up with a rationale for putting aside even less is irresponsible. Public Service of New Hampshire presented a cost estimate of \$170 million in testimony before the New Hampshire Public Utilities Commission in Docket No. DF 84-200 for total decommissioning costs in 1984 dollars. PSNH has had a long and distinguished history of grossly underestimating costs related to the Seabrook project. Paul Chernick, a witness for the Consumer Advocate, put forth in the above-referenced case an estimate of \$311 million and Dr. Richard Rosen, a witness for the Campaign for Ratepayers Rights, estimated the costs at \$300 million. The true costs of decommissioning the Seabrook plant will almost certainly be above \$170 million and, given the fact that Dr. Rosen's past cost estimates for Seabrook have been understated, may well exceed those estimates at or around \$300 million. Again, as stated above, SAPL believes that until the Commission arrives at a detailed definition of decommissioning, all cost estimates are going to be unreliable.

D.1.1.1

D.2.1(a)

It is important that at regular intervals the utility adjust the decommissioning cost estimates over the life of the facility and not wait until 5 years prior to the projected end of operation to update its estimate. SAPL would suggest that a reexamination of the cost estimates be required at least once every five years over the life of the facility.

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#### METHODS

This proposed rule discusses three categories of decommissioning alternatives; DECON, SAFSTOR or ENTOMB. For power reactors, which is again all SAPL is addressing in this comment, the ENTOMB option should clearly be forbidden since it is perfectly clear that all the contaminants within a retired reactor cannot be expected to decay to levels that would make unrestricted use permissible within a period of around 100 years. Where it is eminently predictable that ENTOMB will not serve to protect the public health and safety adequately, it ought to be expressly forbidden in the rule. Removal of the reactor internals alone would not suffice to remove all the long-lived isotopes contaminating the reactor structure. It even seems likely that neutron bombardment might affect the reinforcing steel within the

B.5

containment dome itself. The very long-lived isotopes nickel-59 and niobium-94 have already been identified as problems in the reactor internals and it seems not unreasonable to expect that these isotopes would be found in other parts of the reactor structure. Therefore, the chosen method of decommissioning must safely deal with isotopes that will last hundreds of thousands of years. Ultimately, DECON is the method that must be employed on all reactors. In this rulemaking, it is aptly noted that: "The use of DECON assumes the availability of capacity to handle waste requiring disposal." SAPL remains not sanguine about the prospects for availability of capacity since the technology for high level waste disposal is as yet untried in the U.S. and the suitability of the sites under scrutiny is as yet unproven. The Commission ought to address these uncertainties.

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ENVIRONMENTAL IMPACT REVIEW REQUIREMENTS

SAPL finds the Commission's stated opinion that there is no need for preparation of environmental impact statements in connection with issuance of license amendments or orders authorizing decommissioning frankly appalling. Only the most cursory general treatment has been accorded the subject of decommissioning in the environmental reports and environmental impact statements developed in connection with the licensing of major nuclear facilities. SAPL believes that the Commission's opinion runs directly counter to the requirements of the National Environmental Policy Act (NEPA). The decommissioning of a reactor in order to return land to unrestricted use is certainly a federal action significantly affecting the quality of the environment and therefore subject to NEPA requirements. An environmental assessment alone is not enough.

F.1

OTHER MATTERS

This rulemaking leaves very unclear what quality assurance and quality control (QA/QC) regulations would be in effect during decommissioning. SAPL believes that the process of decommissioning should be carried out under the strictest of QA/QC requirements in order to ensure public protection. Further, the proposed rule gives no guidance or direction with respect to worker exposure. SAPL has a great deal of concern about the long-term impacts on the human gene pool of genetic anomalies induced by exposure of segments of the population to ionizing radiation. SAPL takes the position that a great deal of attention ought to be devoted to development of worker protection standards for the purpose of minimizing exposure.

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C.1.8.1

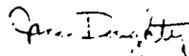
CONCLUSION

The proposed rule set forth at 50 Federal Register 5600, February 11, 1985, is not ready to be promulgated until decommissioning is fully defined, especially as regards residual levels of radioactivity. The funding, the methods, the environmental impacts, quality assurance and worker exposure issues are not addressed in this proposed rule in such a manner as to ensure that the public interest will be protected.

E.2

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Sincerely,



Jane Doughty  
Field Director

COMMENTS ON

PROPOSED RULE PR-3040,50 et al  
(50 FR 5600) (81)

DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES  
FEDERAL REGISTER, VOL. 50, p.5600

David S. Pate

506 E. Bellefonte Ave.

Alexandria, VA 22301

DOCKETED  
USNRC

85 MAY 15 A10:48

GENERAL REMARKS

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Obviously, the proposed rules for the decommissioning of nuclear facilities will again have to be extended until such time as the NRC gathers ample scientific data on the decommissioning options. These proposed regulations should "assure that decommissioning of all licensed facilities will be accomplished in a safe and timely manner". The rules as proposed would neither provide for safe or timely decommissioning. I have never seen any federal agency propose rules in such an obviously inept and irresponsible fashion.

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After reading through the proposed rules in the Federal Register, I can assure you that I certainly do not feel that my health and public safety are being served by the haphazard fashion in which the NRC has seen fit to deal with an issue of such far reaching economic and public safety impacts. The rules as proposed are unworkable, short-sighted and undesirable from any perspective imaginable.

To begin with, I find it incredible that the NRC has issued these proposed rules in light of a clearly defined, economic and technologically sound decommissioning strategy. Specifically, under the three proposed decommissioning strategies there simply is not a REALISTIC provision for funding the decommissioning in a consistently safe manner. True to form, the nuclear industry and the NRC underestimates what the actual costs will be for decommissioning power reactors, nonpower reactors and other nuclear facilities. In terms of environmental protection, the proposed rules are a sham, overtly violating the National Environmental Policy Act.

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Secondly, surely the downtrend in limits of acceptable radiological impacts implicated in the proposed rules should be subject to a thorough dialogue before these self-serving rules are to be taken seriously by the public at large. The ambiguous and nefarious nature of the decommissioning options presented in the proposed rules appear to be much more positive than the input of scientific and "real world" experience would dictate. The superficiality of the proposed rules verges on insult and I find

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it difficult to take them seriously when considering the long range implications of these rules.

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Thirdly, setting a hundred year cooling-off period for reactors (Why 100 years ?), based on some criteria that "about 100 years ...is considered a reasonable time period for reliance on institutional control", is full proof that the inmates have taken control of the asylum. Considering the recent wave of financial downturns for the electric utility industry, including bankruptcies, I find it a large pill to swallow indeed that any nuclear facility operator can be accepted carte blanche for any period let alone one hundred years. By the way, what about reactors shut down prior to promulgation of these proposed rules? What exactly does, "plans should be submitted in a timely way for review and approval prior to the initiation of any major decommissioning activity to avoid delay", mean?

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It goes without questioning that the proposed option of the internal reserve provision which someone had the gall to include in this highly suspect document should be eliminated in the proposed rules as totally unacceptable. If we are to seriously examine the decommissioning issue, the funding level must be reexamined. To think that the \$100 million level is adequate illustrates the absurdity of these proposed rules ( especially funding plan!). These proposed rules illustrate that the NRC is again sleeping with the nuclear industry. Shame, shame, shame!

D.3.2.1.1(a)

D.1.1.1

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Finally, I find it utterly astounding that these rules have even been dignified in the Register as they lack any substantive reference to decommissioning guidelines for any of the included nuclear facilities. In light of the downward trend in acceptable levels of radiation exposure, surely someone in Silver Spring has to be aware that lowered levels will certainly add geometrically to the actual costs of any plant being decommissioned.

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To close my comments on this charade, it is certainly obvious to me that the proposed timeframe for these "hollow" rules to take effect must be delayed. In carrying out this agency's mandate to protect the health and public safety, decommissioning rules must not be made until such time as the technical merits of the various decommissioning alternatives are ascertained so that these rules don't lead to an appreciable waste of public moneys and serve as a roadblock to the economic development of the United States. The present uncertainties in the nuclear industry will be greatly enlarged with the promulgation of confused and indecisive regulations for the decommissioning of nuclear facilities.

G.1



PROPOSED RULE NUMBER PR-30,4950 et al

LAKELAND (50 FR 5600) (82)

UDUBON SOCIETY, INC.

May 10, 1985

DOCKETED USNRC

Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington D. C. 20555
Attn: Docketing & Services Branch

'85 MAY 15 10:46

OFFICE OF LEGAL COUNSEL
DOCKETING & SERVICE BRANCH

Ref: NRC Proposed Decommissioning Rule # 50 Fed. Reg. 5600, February 11, 1985
Dear Sirs:

The subject of decommissioning of nuclear reactors is of major importance to all citizens because of safety problems during the process and of costs involved. It is the citizen who is exposed to the risks and it is the citizens who ultimately pay the cost. Not only are engineering problems involved in the process but social implications -- dangers of exposure to radioactivity to workers -- dangers to local residents -- increase in transportation of radioactive wastes -- and future land use for facility areas. All these require the formation of an affective decommissioning policy.

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I find that the Proposed Decommissioning Rule is inadequate and unrealistic. There is little assurance that necessary funding will be available, little concern for the exposure of workers, nor is it shown that the reactor site will be restored to "safe" use.

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B.1.3

The Rule allows nuclear power plants to choose among (3) decommissioning methods: 1) Dismantlement 2) Safe Storage (for 30-100 years) 3) Entombment (encasement in concrete)

B.3.1

First, to allow the utility to choose. From past practices, this usually means "the cheapest method." Dismantlement offers high exposure to radioactivity to both workers and to the area. This method assumes "a place to put it," and the decision for a site of a permanent repository has not been made. However, it is the best of the three.

B.4.2

Safe Storage will be expensive. A utility could very well go bankrupt during the allotted years.

B.4.4

Entombment is not an adequate solution and should not be included as a choice.

B.5

Acknowledgment received May 15 1985

MRS. HELEN KLUGE
110 S. WASHINGTON
ELKHORN, WIS.
68181

ELKHORN, WISCONSIN 53121

The regulatory Rule should include specific criteria by which a utility's decision is reviewed and studied. The Guide to be published at a later date should be in the Rule -- otherwise it is not binding. In fact, no guidelines are offered at all in the proposed Rule. Furthermore, standards are needed for worker safety during decommissioning. The Rule does not mention quality assurance or quality control. This is a serious oversight for any worker's welfare. Utilities should have basic safety criteria to follow during this specific process -- not merely their usual safety procedures.

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C.1.3  
C.1.8.1  
C.6  
C.1.3

In addition, there should be accurate and specific classifications and identifications in the radioactive waste disposal. (Not as in the definition of low level waste....."anything that is not high level waste.") If the classifications are not specifically "spelled out" much of the waste could fall into the low level repositories for which they are not properly constructed. This could result in a potential danger to the groundwater and to the drinking water of the site area. The term "intermediate-level wastes" was vague and should be defined more clearly.

H.1.1.1

Finally, the Payment Methods:

- 1) Prepayment (Funds held separate)  
In my opinion, this external "sinking fund" is the best method....probably the only answer.
- 2) Regular payments into a fund...utility control and held separate
- 3) Internal funding
  - a) Utility would invest (held separate)
  - b) To be mixed with other assets (NOT separate)  
This option SHOULD NOT be in the Rule. Offers no bankruptcy protection. No guarantee that assets will be worth anything when the time comes for decommissioning. (WPPS, for example) Tremendous bookkeeping for the utility.. that is, if the "funds" are to show up in the "ledger."

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D.3.2.1.1(a)

In conclusion, the cost of decommissioning, I think, is completely underestimated. The Battelle figures are outdated. What is needed is new realistic data for these estimates. (And not like the "too cheap to meter" myth.) Construction of nuclear power plants has gone up 1000 fold and if the COST of WASTE and DECOMMISSIONING are added, the figure would be far higher. The cost figure should be a cold, hard, realistic figure -- not a sham. In order that the utilities, the government, and the citizen can plan rationally. Sufficient funding is of major importance for we should not put this cost entirely upon the future generations. Unless these rules are set up strictly and realistically for the utilities, the government will have to

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assume the entire cost of decommissioning, in my opinion.

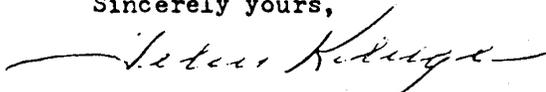
| D. 8.1

I hope the Final Rules for Decommissioning will be stronger, much more specific, and far more adequate than this PROPOSED RULE.

| D. 8.1  
| G. 1

I thank you for the opportunity to express my comments in writing.

Sincerely yours,



Helen Kluge, Conservation  
Chair  
Lakeland Audubon Society

DOCKET NUMBER  
PROPONENT FILE

PR-30,40,58 et al  
50 FR 5600

(83)

# Utility Ratecutters of Kentucky

DOCKETING  
USNRC

May 11, 1985

85 MAY 15 10:45

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn: Docketing and Service Branch

Ref: Decommissioning

Gentlemen:

We have been frightened to learn that rules now under consideration allow two very unsettling circumstances to happen. They are as follows:

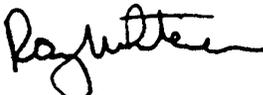
- 1) Continuing to allow entombment as a viable alternative. This out of sight, out of mind argument will come back to haunt generations to come.
- 2) Collecting money in rates for plants no longer operable. Needless to say, it is the stockholders' duty.

B.5

D.4.6.3

Thank you for the opportunity to discuss these matters.

Sincerely,



Ray Whitener  
Chairman

cc: Congressman Ron Mazzoli  
Senator Mitch McConnell

Acknowledged by card MAY 13 1985

pd

P.O. Box 132 Louisville, Kentucky 40201



## COALITION FOR THE ENVIRONMENT

6267 DELMAR BLVD.  
ST. LOUIS, MO 63130  
(314) 727-0600

INTERSTATE BLDG.  
1300 LOCUST ST.  
KANSAS CITY, MO 64106  
(816) 471-1450

DOCKETING  
USNRC

'85 MAY 15, 10:44 1985

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
United States Nuclear Regulatory Commission  
Washington, D.C. 20555

FILE NUMBER  
PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (84)

Dear Sir or Madam:

The Missouri Coalition for the Environment supports the comments to be submitted in May, 1985, by the Nuclear Information and Resource Service regarding the proposed rule entitled "Decommissioning Criteria for Nuclear Facilities" (50 Fed. Reg. 5600, February 11, 1985).

Sincerely,

Thomas R. Crane  
Executive Director

Acknowledged by mail 11/15/85



State of Rhode Island and Providence Plantations

Department of Health  
CANNON BUILDING  
Davis Street  
Providence, R.I. 02908

SUBJECT NUMBER  
PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (85)

DOCKET  
SHRC

10 May 1985

'85 MAY 15 AIO:43

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF RECORDS &  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch  
Reference: Proposed rule, "Decommissioning Criteria for Nuclear Facilities"

Dear Mr. Secretary:

We are writing to offer a brief comment on what we perceive to be a likely consequence of the referenced proposed rule on medical licensees in Agreement States. As we understand the proposed rule, medical licensees would be largely unaffected because they generally do not utilize unsealed by-product material of half-life greater than 120 days. Therefore, it appears that the Commission may believe that the proposed rule would not affect most medical licensees. However, all medical licensees who are authorized for Group I isotopes by Agreement State licenses are thereby authorized to use Cobalt-57, an accelerator-produced isotope of 270 day half-life. To our knowledge, this is the only isotope of half-life greater than 120 days commonly used in nuclear medicine, and, therefore, the only isotope which would bring most medical licensees in Agreement States under the decommissioning rule.

Most, if not all, Agreement States regulate accelerator-produced radioisotopes and by-product material under the same set of regulations. In this state, and in other states whose regulations are modeled after the Suggested State Regulations for the Control of Radiation, the regulations contain a table identical to Appendix C of Part 20. This table does not list accelerator-produced isotopes, and these isotope quantities are established by the rule at the end of the table. This is, the table quantity for all accelerator-produced isotopes is 0.1 microcurie.

The point we wish to bring to your attention relates to the compatibility requirement associated with the proposed rule. Assuming that the rule is adopted by the Agreement States in its present form, it follows that medical licensees in Agreement States will have to demonstrate financial assurance for decommissioning if they are authorized to possess more than 0.1 millicurie of Cobalt-57. (The usual possession limit for Group I isotopes is: "as needed".) Even if the Agreement States were to revise their tables to specify a "realistic" quantity for Cobalt-57, it would seem likely that the qualifying possession limit (for financial assurance) would only be increased to somewhere in the range of 1 to 10 millicuries. In either case, we think that most medical

D.6.1

HEALTH - A WAY OF LIFE

Telecommunications Device for the Deaf (TDD): 277-2506

Acknowledged by card MAY 13 1985 *pd*

U.S. Nuclear Regulatory Commission  
Secretary of the Commission  
10 May 1985  
Page 2

licensees would hasten to apply for license amendments to reduce their possession limit for Cobalt-57 in order to avoid falling under the decommissioning rule. If this "solution" is undertaken by the majority of nuclear medical licensees, a severe paperwork crisis may fall upon Agreement State radiation control programs. (Presumably, all licensees, both Agreement State and NRC, will review their possession limits to determine whether they can be reduced for the purpose of either decreasing or eliminating the need for financial assurance.)

D.6.1

In summary, it would appear prudent to consider the ramifications described and, in addition, the adverse and possibly unwarranted hardship which would be imposed upon the majority of nuclear medicine facilities, medical research licensees who use accelerator produced isotopes, and other "borderline" cases.

Very truly yours,

COMMUNITY HEALTH SERVICES



James E. Hickey, Chief  
Division of Occupational Health and  
Radiation Control

pc: D. Nussbaumer, OSP  
J. Ward, California  
C. Hardin, CRCPD

cag



Minnesota Public Interest Research Foundation

2412 University Avenue S.E. Minneapolis, Minnesota 55414

Phone (612) 376-7556

JACKET NUMBER

PROPOSED RULE

(50 FR 5600)

PR-30,40,50 et al

86

BUCKETED

May 9, 1985

# Radioactive Waste Project

MAY 15 10:29

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
OFFICE OF...  
BRANCH

Re: Comments on Proposed Decommissioning Criteria for Nuclear Facilities, 10 CFR Parts 30, 40, 50, 51, 70, and 72

Dear Sir or Madam:

The Radioactive Waste Project would like to take this opportunity to comment on the NRC proposed rules for decommissioning nuclear facilities. The Project is part of the Minnesota Public Interest Research Group (MPIRG) which represents more than 50,000 members on nine campuses throughout the state. The Radioactive Waste Project is funded through MPIRG's foundation, MPIRF, as a research and education project on nuclear waste transportation and disposal. The Project has provided technical assistance to state legislators on decommissioning, as well as worked with national organizations on this issue. MPIRG has argued against the use of an internal fund to finance decommissioning in hearings before the Minnesota Public Utilities Commission. Thus, over the years, the Project and MPIRG have developed considerable expertise in this area.

At the outset, the Commission is to be commended for taking an important first step in regulating the decommissioning process, by establishing funding schemes to ensure the availability of adequate financing for decommissioning when plants cease to operate and are no longer generating revenue. However, the proposed rules do not go far enough in addressing the myriad of problems associated with decommissioning nuclear facilities.

First, the provision in the proposed rules allowing licensees to fund decommissioning from unsegregated utility accounts and assets (an internal fund) must be eliminated. It is imperative that decommissioning funds not be within the sole control and purview of the licensed utility for two reasons. One, there is no guarantee the licensee will be financially solvent at the time of decommissioning; and two, decommissioning--both cost and method--raise numerous public policy issues which must be addressed in public forums. Whoever controls the financing of decommissioning will also control the extent of public input and debate.

In addition, the proposed rule appears to underestimate the cost of decommissioning nuclear power plants; the information on which the proposed rule is based must be updated and made more conservative to ensure the adequacy of funds. Moreover, the Commission should require each utility to update its decommissioning cost estimates every five years.

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D.3.2.1.1(a)

D.3.2.1.2

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D.4.3

Acknowledged by card..... MAY 15 1985 *pd*

The proposed rule gives little substantive guidance on how decommissioning should be conducted. Little or no guidance is given on how decommissioning methods should be chosen and carried out in order to minimize the significant radiation risk to workers and the general public. Moreover, the rule does not establish any special requirements for the decommissioning of plants that have experienced a radiological accident where the work is most dangerous and costly.

C.1.3  
C.1.17.1

In summary, the proposed rule has several major shortcomings:

1. It permits the use of unreliable funding methods, and underestimates the cost of decommissioning thus reflecting inadequate consideration of the costs and public health risks;
2. It creates an inadequate and confusing regulatory scheme;
3. It violates the National Environmental Policy Act by relying on the 1981 Draft Generic Environmental Impact Statement on decommissioning which contains outdated information and does not give adequate consideration of various decommissioning alternatives;
4. It fails to establish standards for conducting decommissioning, especially in the area of minimizing worker exposure and radiation monitoring;
5. It fails to address the specifics of waste disposal, including a delay in the shipment of high level waste to a permanent federal repository; the availability of "low level" and "intermediate" waste disposal sites; and the proper disposal of chemical wastes generated during decommissioning.

D.3.2.1.1(a)  
D.1.1.2  
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F.1  
C.1.8.1  
H.1.1.1  
H.1.2.1

The Project supports and endorses the comments on the proposed decommissioning rule submitted by the Nuclear Information and Resource Service, and urges the Commission to address the issues and adopt the recommendations proposed by NIRS.

Specifics Areas of Concern Regarding Proposed Decommissioning Rule  
Give

1. The Rule Does Not/Assurance of Adequate Funding because the costs and risks of decommissioning have been underestimated.

NRC research has shown that operation and maintenance practices at reactors could lead to big differences in decommissioning costs depending on the volume of waste and the amount of radioactivity which would entail higher disposal costs. Decommissioning experience shows that the cost of decommissioning a large reactor with a long operating life will in fact be much more than the \$100 million figure calculated in the proposed rule.

The cost of decommissioning should be made more conservative because acceptable dose rate levels may decrease in the future. In addition, the cost of decommissioning will increase as allowable worker exposure levels are decreased. An addendum to NUREG/CR-0130 (Battelle, 1979) estimated that labor costs would increase by

D.1.1.1

\$2.5 million due to the need to hire additional staff to keep individual worker doses within current allowable limits.

The rule should require reassessment of costs and readjustment of decommissioning fund at five-year intervals throughout the plant's operating life. It is incredibly poor planning to wait until the eve of decommissioning to require a licensee to reassess those costs and then make up the difference, as provided by the proposed rule.

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D.4.3

## 2. Unreliable Decommissioning Funding Methods Permitted.

The establishment of an internal reserve should be removed from the proposed rules because it does not provide sufficient assurance that decommissioning funds will be available when the plant is ready for decommissioning. Financial solvency or bankruptcy would place unsegregated decommissioning funds at serious risk. Allowing a utility to pledge the assets of one plant to decommission another simply shifts the obligation between the same pool of debtors without providing any security that decommissioning funds will in fact be available.

Although the discussion preceding the rule states that the utility using the internal reserve must have backup insurance, this requirement does not appear in the text of the proposed rule, thus the commission's legal authority to enforce this requirement is questionable.

Both the internal reserve and the external sinking fund suffer from the weakness of assuming that a licensee will be able to continue making payments into the fund over the life of the plant. If a plant shuts down or stops generating revenues, the licensee may be unable to make those deposits. Any funding scheme which relies on deposits made over time should be backed by insurance for premature shutdown.

D.3.2.1.1(a)

D.3.2.2.1

## 3. Decommissioning Regulations Are Unclear and Inadequate.

The way the proposed rule is structured is confusing and unclear. Rather than amending six different parts, it would be better if the Commission created a separate set of regulations governing decommissioning. A separate part on decommissioning would achieve a number of positive benefits. First, those being regulated, state agencies, and the public would be able to find the appropriate regulations with relative ease. Second, the Commission could develop a comprehensive scheme for decommissioning including, sufficient guidance to licensees for choosing methods of decommissioning, as well as the development of specific safety regulations.

Moreover, under the proposed rule the licensing scheme is unclear. The result is that the role for meaningful citizen participation in decommissioning decisions is confusing and could result in unfairly limiting public participation in important policy decisions.

Moreover, the proposed rule contains little or no specific guidance for decommissioning. As recommended in NUREG/CR-0130, (Battelle, 1979), the NRC should prepare an index of the existing regulations applicable to decommissioning. These regulations

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should be incorporated by reference into a separate set of rules that specifically govern decommissioning.

The rule should provide specific guidance for decommissioning at three stages of decommissioning: 1) at the planning stage when a utility weighs the costs and benefits of choosing a particular decommissioning method; 2) during any period of "safe storage" that is allowed by the NRC; 3) during the actual decommissioning operations. These regulations should provide a framework of safety goals which can be met through a variety of means--thus providing flexibility to deal with specific problems which may be unique to a facility. Moreover, some of the safety goals could be suggested in non-binding Regulatory Guides.

It is important for the Commission to develop a criteria for choosing among the various decommissioning options. The proposed rule fails to do this. Moreover, the proposed rule should clearly state that "ENTOMB" or permanent encasement of the facility is not a viable option for decommissioning nuclear power plants.

In choosing between immediate decontamination, dismantlement, and removal of the facility ("DECON") or "SAFSTOR", a method of chemically decontaminating immediately and postponing dismantlement to allow for radioactive decay, the licensee is given vague of limited guidance by the proposed rule. Thus, the proposed language leaves the licensee with almost entirely unreviewable discretion to make decommissioning choices that could have significant impacts on public and worker health and safety.

The proposed rule does not discuss important considerations which should be factored into a choice between DECON and SAFSTOR; for example, the age of the plant and the corresponding amount of radioactivity that had built up in the plant or the number an extent of accidents/incidents at a plant.

The proposed rule also fails to discuss the availability of off-site storage or disposal space for spent reactor fuel, other high level waste, or intermediate and low level wastes. Prolonged storage might be the utilities' only choice if no storage space is available for any of these wastes.

The choice of decommissioning methods raises important public policy considerations which should not be left to the complete discretion of licensees as the rule proposes. The Commission should establish specific criteria for the choice of a decommissioning method that provides the maximum possible assurance that the health and safety of workers and the public will be protected. Furthermore, the Commission should establish a forum and procedure whereby the public can have meaningful input into public policy decisions affecting the health and well-being of their lives and the lives of future generations.

#### 4. Standards for SAFSTOR Option Must Be Developed.

The proposed rule contains no standards governing the long term storage period inherent in the SAFSTOR decommissioning option. First, the rule should provide criteria by which the appropriate length of time can be determined, balancing the site-specific cost and benefits. Second, the rule should provide regulations for

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B.4.3

C.1.3

preparation of the facility for safe storage and ongoing maintenance. Third, the rule should provide an upper limit to the length of time allowed for mothballing a reactor. The rule should balance any incremental benefits against the ever decreasing assurance that adequate funds will be available as time elapses. Moreover, the rule should set an upper limit for completing the SAFSTOR option.

C.1.3  
B.4.3

5. Standards for Conducting Decommissioning Must Be Developed.

The proposed rule offers no substantive regulations for the conduct of decommissioning. Thus, the rule as proposed is inadequate to serve as guidance for nuclear power plant decommissioning.

C.1.3

The Commission should devote substantial attention to the development of standards to minimize worker exposure during decommissioning, including specific radiation monitoring requirements.

C.1.8.1

Moreover, the Commission should require the registry of workers who participate in decommissioning activities for the dual purpose of properly assessing the health impacts of their cumulative exposures, and for compensation purposes arising from wrongful death law suits in the future.

C.1.10

Furthermore, the Commission should require representatives of workers to be involved in the creation of the decommissioning plans and procedures.

C.1.8.2

The proposed rule should implement regulations that provide for quality assurance/quality control (QA/QC) throughout the planning and carrying out of decommissioning activities. This should include the establishment of a QA/QC staff that is independent from the engineering and radiation monitoring departments. Quality assurance regulations, such as those in Part 50 Appendix B for operating plants, should be provided for decommissioning.

C.6

Additionally, just as Part 50 Appendix A provides "General Design Criteria" for the safe operation of nuclear plants, the proposed rule should establish certain safety criteria for decommissioning. Further, a plant put into "safe storage" should meet certain security, inspection, and reporting requirements.

C.1.3

As the proposed rule now stands, a licensee could conduct its decommissioning activities with virtually complete independence.

6. The Safe Disposal of Wastes Must be Addressed.

To ensure safe disposal, the NRC must implement regulations that classify and designate appropriate disposal methods for all of the wastes produced from decommissioning, including "intermediate" wastes which are not currently classified or designated for any particular disposal method.

H.1.1.1

The rule should provide guidance for the special problems associated with the proper disposal of chemical wastes generated during decommissioning. The very quality of these chemicals which make them effective for cleaning contaminated systems, also makes the radionuclides soluble. Thus, chelated wastes containing radioactive material can migrate quickly when disposed of. The NRC should require physical barriers which would prevent these wastes from reaching other nuclear or chemical wastes present in burial grounds. Moreover, the rule should require a licensee to make public the chemical formulas used

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H.1.2.2

in the decontaminants, and demonstrate adequate levels of testing and scientific review to ensure that the chemical agents can and will be stabilized or deactivated.

H.1.2.1

The rule should require licensees to minimize the amount of waste produced, holding them to an "As Low As Reasonably Achievable" standard. Licensees should also be required to show that the wastes produced will be accepted by appropriate disposal sites.

C.1.14  
H.1.1.5  
H.1.1.2

Decommissioning plans should show how the decommissioning activities will be affected should there be a delay in the shipping of decommissioning wastes.

C.1.15

7. Rule Should Apply to All Reactors.

The rule as proposed would exclude a small number of reactors that will have been permanently shutdown when certain provisions of the rule go into effect. Rather than the current blanket exception for reactors already shutdown, it would be better to create an exemption procedure in the regulations, thereby ensuring the consistent application of NRC's safety regulations.

C.9

8. The DGEIS Is Insufficient to Support the Proposed Rule.

The DGEIS should identify the environmental impacts of decommissioning and weigh the costs and benefits of various decommissioning alternatives with sufficient detail and accuracy to assist the NRC's choice between the alternatives. The DGEIS is inadequate for a number of reasons. First, the information in the DGEIS is out of date. Second, the DGEIS does not discuss the cumulative impacts of decommissioning all of the of the nation's nuclear plants. NRC's contractors estimate that the decommissioning of each reactor will contribute a volume of low level waste approximately equivalent to one-quarter of the total annual waste currently produced. Nor are the impacts of the disposal of high level and intermediate wastes considered or the disposal of chelated wastes. Third, the DGEIS fails to discuss the ways in which the availability of disposal sites could affect decommissioning choices. Finally, the DGEIS fails to adequately address the effects of accidents on decommissioning or the impacts of using chelating agents during decontamination. Thus the DGEIS provides no real guidance for a choice between decommissioning options.

G.5

I appreciate the opportunity to present these comments for your consideration and urge you to address the areas of concern which have been raised. In the long run it will be easier, cheaper, and faster for the Commission to develop a comprehensive set of regulations for decommissioning than to enforce the proposed rule under consideration.

G.1

If you have questions or comments, please call me at (612) 376-7556.

Very truly yours,

  
Barbara J. Johnson, attorney  
Project Director

cc. Minnesota Congressional  
representatives

PROPOSED RULE PR-30,40,50 et al (87)  
(50 FR 5600)



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USNRC

'85 MAY 15 P4:19

May 10, 1985  
PY-CEI/NRR-0257L

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Mr. Samuel J. Chilk  
Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Re: Proposed Rule Regarding Decommissioning Criteria for  
Nuclear Facilities, 50 Federal Register 5600

Dear Mr. Chilk:

The Cleveland Electric Illuminating Company appreciates the opportunity to comment on the proposed rule for decommissioning nuclear facilities. These comments will address two areas--the \$100 million certification option and the internal reserve method for funding.

The \$100 Million Certification Option

The proposed rule states that the amount of funds assured for decommissioning can be based on a site-specific study or a certification that at least \$100 million of funding will be provided. The alternative method of determining the amount of funds is very troublesome. It should only be based on a site-specific study which, clearly, is more accurate. The other method, while maybe a well intentioned administrative tool, will create unwarranted problems for those utilities who diligently undertake site specific studies. The amount of \$100 million is too low by our cost estimate. Nevertheless, the \$100 million certification will, or could, put a ceiling on the amount of decommissioning costs which may be recovered through rates by state regulators, regardless of the result of a carefully conducted site-specific study. Indeed, a utility may be asked to justify any cost estimate which is higher than the certification amount. The Company already has a site-specific study, completed in 1984, which shows a cost estimate higher than \$100 million, although the study does include costs for demolition of nonradioactive structures and site restoration. Justifying a cost estimate higher than the \$100 million certification would be unduly burdensome and counterproductive.

D.2.1(a)

1 Acknowledged by card... MAY 15 1985  
*pa*

If the certification alternative is not omitted from the proposed rule, ample explanation to put this alternative amount into proper context, as to its applicability and reliability, is needed. Further, it is not clear in the rule that the amount is not intended to cover the costs of demolishing nonradioactive structures and site-restoration. This fact must be brought out. Additionally, it should be stressed that a site-specific study is a better alternative than the certification option.

D.2.1(b)

#### The Internal Reserve Method for Funding

The Company is pleased that the proposed rule provides for a variety of alternatives for decommissioning cost funding. The internal reserve method would be the most appropriate and likely choice for electric utilities because of the economics of the method. Indeed, the Commission recognizes, in its regulatory analysis, that the other alternatives tend to be more costly and adopts the estimates that the external sinking fund and prepayment method are approximately 2 to 3 times the cost of the internal reserve (50 Federal Register 5608, Col. 1).

D.3.1

Does the internal reserve method provide reasonable assurance? The Company believes so. The funds received for decommissioning can be invested into the utility's assets, and bonds would be issued against these assets to raise funds for decommissioning. In this situation, it is the utility who stands behind the fund. However, the utility must stand behind the other methods also. Hence, it is the utility's financial integrity which provides the assurance under any method.

D.3.2.1.1(b)

The Commission also requested comments regarding the possibility of insolvency and its impact on decommissioning funds. As the proposed rules indicate, the internal reserve method would be appropriate for utilities owning more than one generating facility. Hence, a utility would have a broad base of assets with which to cover the costs of decommissioning. Additionally, it is doubtful if a utility in financial straits would be forced to close since it has an obligation to provide electric service, and would have cash resulting from operations for decommissioning funding.

The funding method a utility eventually elects for decommissioning should be one decided upon by regulators and the utility. Each case will have unique characteristics which will help to dictate the appropriate funding method.

D.8.3.1

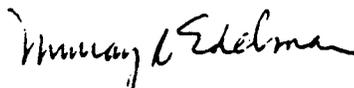
#### Closing Comment

The proposed rule would require that an applicant for an operating

license provide information regarding the assurance of funds for decommissioning. It appears that it is not the Commission's intent to impose this requirement on applications for operating licenses which have been filed prior to the effective date of the rule. This should be clarified in the rules.

D.4.1.2

Sincerely,



Murray R. Edelman  
Vice President-Nuclear

MRE:ms

PROPOSED RULE PB-38-40, 50 et al  
(50 FR 5600) (88)



Bart D Withers Vice President

May 13, 1985

DOCKETED  
USNRC

'85 MAY 16 A9:59

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington DC 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Sir:

Comments on Proposed Decommissioning Criteria for Nuclear Facilities

Portland General Electric Company (PGE) has reviewed the proposed NRC rules on decommissioning criteria for nuclear facilities (February 11, 1985, Federal Register). PGE supports the concept of providing reasonable technological and financial assurance that nuclear facilities will be decommissioned in a safe and effective manner. Toward this end, PGE has a state-approved decommissioning financial plan in place and has been accumulating a decommissioning reserve fund since 1978.

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The proposed rule is, in general, consistent with the aim of assuring safe and effective decommissioning. However, certain aspects of the rule would, in our opinion, result in unnecessarily increasing costs to utility ratepayers without providing any increased assurance that decommissioning will occur. Our comments on the proposed rule are as follows:

A. General Comments

1. The NRC's principal concern in regard to decommissioning should be to ensure that nuclear facilities will be decommissioned in a safe and effective manner. As long as funding can be reasonably assured by the licensee, the NRC should not be concerned with whether the funding plan is cost-effective or which method of funding is chosen. In the case of utilities, these decisions are more appropriately left to State Public Utility Commissions and/or the Federal Energy Regulatory Commission, whose responsibilities include allowing the recovery of appropriate costs in rates.
2. There appear to be some inconsistencies between the proposed rule and the Supplementary Information provided in the rule. For example, in the Supplementary Information, Page 5608, the opinion is expressed that "the internal reserve method is acceptable only if supplemented by a mechanism providing additional assurance such as insurance or surety arrangement", while in the proposed rule, Section 50.33(k)(4), it is indicated that the internal reserve

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D.8.3.1

D.3.2.2.1  
D.3.3.2

Acknowledged by card..... MAY 16 1985

Portland General Electric Company

Secretary of The Commission

May 13, 1985

Page 2

method is acceptable for an electric utility only if the utility owns more than one generating facility. The rule and the Supplementary Information should be carefully reviewed to eliminate these inconsistencies.

D.3.2.2,1  
D.3.3.2

B. Specific Comments

1. The amount of the required decommissioning fund (\$100,000,000 in 1984 dollars) appears high compared to other estimates made by Battelle Northwest Laboratories and the Atomic Industrial Forum. In addition, the decommissioning cost figure is specific to the location, size, and type of facility. The rule should not mandate a minimum cost figure but should require that a cost estimate be made for each individual plant when the decommissioning plan is submitted to the NRC.
2. The amount of increase per year of twice the rate of inflation is unrealistic. An increase at twice the rate of inflation for 30 years will result in a real cost increase of four to five times the cost estimate suggested of \$100,000,000. It is inappropriate to assume that an increase of twice the rate of inflation, as noted in the last two years, will continue for the next 30 years. On Page 5608 of the Supplementary Information, it states that "the proposed rule would require that decommissioning funding plans contain provisions for a periodic review and adjustment to assure that funds would be adequate at the time of decommissioning. For many cases, routine adjustments for changes in inflation and interest rates might be done annually by the licensee and could be reported in the annual financial report without the need for NRC approval. A technical review of the information in the preliminary plans or the cost estimate for a funding plan could be done less frequently and submitted to NRC for approval."

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D.2.1(a)

D.2.1(b)

D.4.3

This proposed requirement was translated into the rule as requiring only one update, at 5 years before the end of facility operation [Section 50.54(cc)(4)]. It is our opinion that a periodic review requirement, such as proposed in the Supplementary Information should be substituted for the current requirement in the rule that costs be escalated at twice the rate of inflation. The periodic review would account for inflation and interest rate adjustments and for adjustments in technology as appropriate. These periodic reviews could be completed at three- to five-year intervals.

3. Surety bonds or insurance are not necessary for the internal funding method during or after the plant's operation. Utilities, like other corporations, must demonstrate financial integrity to investors to have sufficient earnings above the firm's fixed financial obligations. In addition, the utility industry has, in general, been evaluated by the investment community as being more

D.3.2.1.1(b)

Portland General Electric Company

Secretary of The Commission  
May 13, 1985  
Page 3

financially stable than other industries. If a firm's liabilities have been stated properly, the funds recovered for decommissioning will continue to be available for that purpose. Extreme conditions could exist and pose a threat to the availability of funds with internal funding; however, similar conditions could also exist for funds held externally (eg, funds in a bank could be lost if the bank becomes insolvent). The level of assurance of having funds available is nearly equal for both internal funding and external funding. To require additional insurance or surety bonds for the internal funding method would only result in increased costs to consumers.

D.3.2.1.1(b)

4. In the proposed rulemaking, justification to delay decommissioning beyond the end of the plant service life is based upon safety considerations. Comparative costs of the alternative methods of decommissioning should also be included as justification for delay.
5. Proposed 10 CFR 50.33(k)(4)(iv) states that an internal reserve method of accumulating funds is acceptable for "an electric utility owning more than one generating facility". The rule (and the Supplementary Information) does not define whether a "generating facility" is a nuclear power plant or may be some other type of generating facility (dam, fossil-fueled plant, etc). Furthermore, it is not explained why this particular requirement would provide assurance of the availability of funds from an internal reserve account.

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D.3.3.2

We hope that these comments will be helpful in creating a final rule that provides reasonable assurance that nuclear facility decommissioning will be accomplished in a safe and cost-effective manner.

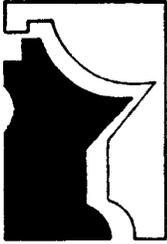
Sincerely,

*B. D. Withers for*

Bart D. Withers  
Vice President  
Nuclear

Attachment

c: Mr. Lynn Frank, Director  
State of Oregon  
Department of Energy



Minnesota  
Environmental Quality Board

100 Capitol Square Building  
550 Cedar Street  
St. Paul, Minnesota 55101  
Phone \_\_\_\_\_

ORDER NUMBER  
ISSUED DATE **PR-30, 40, 50 et al**  
**(50 FR 5600) (89)**

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USNRC

'85 MAY 16 10:01

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BRANCH

May 13, 1985

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Ref: Comment on NRC proposed rules for decommissioning nuclear  
facilities. 50 FR 5600

Dear Secretary:

The Minnesota Environmental Quality Board has been coordinating  
Minnesota's comments on the above referenced rules. Several agencies  
are preparing comments. One, the Department of Public Service, has  
sent its comments to you. The others are in the process of  
completing their review. You should receive all of Minnesota's  
comments by the end of May. I realize that the comment deadline is  
May 13; however, I ask that you consider the additional comments when  
they arrive.

G.8

Sincerely,

Tom Triplett  
Chairman

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MAY 18 1985



ISSUE NUMBER PR-3040, 50 et al  
RECORDED FILE (50 FR 5600) 90

State of New Jersey  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DIVISION OF ENVIRONMENTAL QUALITY  
JOHN FITCH PLAZA, CN027, TRENTON, N.J. 08625

DOCKETED  
USNRC

May 7, 1985

'85 MAY 16 10:02

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Docketing and Service Branch

Dear Mr. Secretary:

We are encouraged by the NRC proposed rule for decommissioning criteria for nuclear facilities (50 FR 5600). We hope that the deliberate assessment of radiation sites prior to license termination will minimize the number of contaminated sites which could develop in New Jersey. The proposed rule places heavy emphasis on having decommissioning funding plans for facilities, with decommissioning standards to be developed under a separate rulemaking action in the future. However, without some indication of the acceptable level of residual radioactivity appropriate for unrestricted use, it is difficult to judge the adequacy of required amounts of financial assurance stated.

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Based on our past experience with nuclear facilities which process raw material, thus producing large quantities of low specific activity bulk waste, it is doubtful the financial limits proposed of \$500,000 or less are adequate. Specifically in the case of W. R. Grace and Stepan Chemical, NRC licensed facilities which are now the responsibility of the U. S. Department of Energy (DOE), the DOE has spent approximately \$2-4 million dollars to remove contaminated soil from offsite vicinity properties and storing that contaminated material on the nearby processing sites. At a presently active NRC licensed facility, Shieldalloy, there is approximately 50,000 yd<sup>3</sup> of slag accumulated on a 20-acre site. Based on our experience with other sites, it is questionable that this site can be decontaminated with funds on the order of \$500,000.

D.6.3.1

Also, we are concerned that there exists the potential for reducing companies' liability for decontamination activities should the NRC approved funding plan be inadequate. Poor financial judgment made by the NRC in evaluating and approving funding plans and the uncertainty inherent in forecasting economic conditions may result in having drastically reduced funds available at time of decommissioning. In addition, since it may be quite a few years before a facility undertakes

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D.6.3.2

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MAY 16 1985

decommissioning, the dollar value listed for financial assurance for decommissioning should be adjusted for inflation.

D.6.3.2

Further, we believe that the NRC should require state consultation in the decommissioning process since these NRC licensed radiation facilities will revert to unrestricted use, thus of no concern to the NRC, after license termination. Consultation will reduce the potential for disagreement between NRC and state over the adequacy of decontamination limits and the residual radioactivity levels. Since there may be questions from future property owners or the general public, documentation of the license termination procedures, radiation surveys of site, record of material licensed and how those materials were disposed should be archived for potential future evaluations.

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G.12

Finally, the scope of licensee's liability in decontamination should include off-site contamination. The licensee should be required to examine waste streams and their impact offsite such as the discharge within permissible limits of treated liquid wastes. Concentrations released under license may result in unacceptable contamination based on decontamination and decommissioning standards at the time of license termination and release for unrestricted use by the general public.

G.13

We appreciate the opportunity to comment on the NRC's proposed rule.

Sincerely,



Donald A. Deieso, Ph.D.  
Director

DOCKET NUMBER

PROPOSED RULE

PR-3046, 50 et al  
(50 FR 5600) (91)

NRC-85-94

WISCONSIN PUBLIC SERVICE CORPORATION



P.O. Box 700, Green Bay, Wisconsin 54305

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OFFICE OF PUBLIC SERVICE  
DOCKETING & SERVICE  
BRANCH

May 13, 1985

Secretary of the Commission  
Attention Docketing and Service Branch  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Gentlemen:

Docket 50-305  
Operating License DPR-43  
Kewaunee Nuclear Power Plant  
Proposed Rule on Decommissioning Criteria for Nuclear Facilities

Reference: Decommissioning Criteria for Nuclear Facilities, Proposed  
Rule 10 CFR 30, 40, 50, 51, 70 and 72, Federal Register  
Volume 50, No. 28 dated February 11, 1985

We have reviewed the proposed rule regarding decommissioning as published in the Federal Register of February 11, 1985. The proposed rule would amend NRC regulations by specifying technical and financial criteria for the decommissioning of nuclear facilities. Specifically, the proposed amendment addresses decommissioning planning needs, funding mechanisms, timing, and environmental review requirements. The intent of the rule is to assure the safe and timely decommissioning of nuclear facilities and the availability of adequate funding.

The Atomic Industrial Forum's Subcommittee on Decommissioning has provided the NRC with comments to this proposed rule. Wisconsin Public Service Corporation (WPSC) is in agreement with those comments, and would like to also offer the following for your consideration.

In general, WPSC supports the NRC's rulemaking efforts in the area of decommissioning. We believe that the proposed amendments will provide a foundation from which acceptable decommissioning planning and implementation programs can be developed. We urge the Commission to encourage, in its rulemaking, the use of a realistic approach to decommissioning cost estimates.

G.I

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*pd*

Secretary of the Commission  
May 13, 1985  
Page 2

In this light, WPSC strongly supports the use of site-specific studies in estimating costs. We believe that generic studies may not prove realistic for specific application to some of today's nuclear power plants and would have an inherent propensity for misuse by the various groups which must remain cognizant of the funding process. To this end, WPSC recommends that the proposed rule be revised to stipulate the use of site-specific studies as a preferred method in cost determination, allowing generic studies to be used only as a contingency approach.

D.2.1(a)

D.2.1(b)

WPSC also urges that decommissioning funding mechanisms utilize the ultimate expected dollar amount (future dollars), not current dollars. This approach will assure equitable treatment to future generations of customers who will also pay their fair portion of the costs of decommissioning plants which are operating today. This is the approach which has been adopted by the Public Service Commission of Wisconsin.

D.3.2.2.4

Finally, WPSC believes that, when forecasting the ultimate expected dollar amount of decommissioning, it is imperative that a realistic long-term inflation rate be used. Thus, the NRC should clarify that the proposed inflation rate of twice the Consumer Price Index, which was determined by observing the net increase of decommissioning cost estimates over the last few years, is intended to represent short-term estimates of inflation. This high inflation rate, which reflects recent regulatory turbulence of the nuclear industry, is not suitable from a long-term perspective and may well mislead regulators who are attempting to forecast the ultimate cost of decommissioning.

D.2.1(a)

D.2.1(b)

In closing, WPSC believes that the Commission should strive for the promulgation of a rule which will meet its stated intent as well as creating an environment where site-specific, realistic, and equitable decommissioning plans can be developed and implemented.

Very truly yours,



D. C. Hintz  
Manager - Nuclear Power

MSL/js

cc - Mr. S. A. Varga, US NRC  
Mr. Robert Nelson, US NRC



SECRET NUMBER PR-344050 et al  
 EXECUTIVE RULE (50 FR 5600) (92)

NUCLEAR SUBCOMMITTEE  
 National Energy Committee  
 854 Henley Place  
 Charlotte, NC 28207  
 May 13, 1985

**SIERRA CLUB** 530 Bush Street San Francisco, California 94108 (415) 981-8634

DOCKETED  
 NRC

Secretary of the Commission  
 U.S. Nuclear Regulatory Commission  
 Washington, DC 20555

'85 MAY 16 11:03

Attention: Docketing and Service Branch

Comments: Decommissioning Criteria for Nuclear Facilities

The Nuclear Subcommittee appreciates the difficulty in establishing criteria for an operation in which experience is minimal. However other, related experience points to a number of improvements which can be made in the proposed criteria.

G.1

1. Decommissioning a plant which has had a release accident, as at TMI-2, is a different matter than a plant which has operated within normal parameters. Though generalized procedures can be proposed for the latter, accident situations must be handled on a case-by-case basis.

C.1.17.1

2. Even for normal shutdowns the funding criteria are inadequate. Rather than setting a limit of \$100,000,000 (1984) the applicant should be required to provide a detailed projection of subsequent cost, subject to staff analysis and approval, based on current information, to be updated every five years until actual decommissioning. Funding provisions should match these projections.

D.2.1(a)

D.4.3

3. Funding must be external to provide reasonable assurance that other claims on a utility's resources will not deplete a decommissioning fund.

D.3.2.1.1(a)

4. The cost of just the cleanup of the TMI-2 accident makes clear that the decommissioning cost after a serious accident can exceed anticipated normal decommissioning cost by at least an order of magnitude. It would be both impractical and inequitable to require of every utility an external decommissioning fund of the order of \$1-2 billion. It appears to us to be the responsibility of the NRC to devise appropriate provisions and criteria for the funding of the decommissioning of a plant more than normally contaminated as the result of a serious accident. Possible means would include the setting up of a fund to be administered by the NRC in which all licensees made annual contributions while operating. This would be similar to the uninsured motorist funds which operate in a number of states.

D.3.2.2.1

5. We oppose the "Entomb" option, favor "Decon" and "Safstor" depending on appropriateness for the specific site. NRC staff, not the applicant, should have the responsibility and authority for determining which is more feasible. In a site of higher potential for a seismic event, "Decon" would be preferred. The presence of spent fuel in the fuel pool would be a substantial consideration.

B.5

B.3.3

B.4.2

Acknowledged by card..... MAY 16 1985

ment  
6. For entomb/to be reliable the NRC would be required correctly to predict the behavior of peoples for thousands of years. There is little enough success in short term prediction--consider the utility industry's prediction of growth in electrical demand, affirmed by the AEC/NRC and FRC/FERC. Curiosity and response to challenge may be around for a long time. Entombed sites built near present populated regions will be a challenge. The development of a tamper proof entombment technology is unlikely; the demonstration is not possible.

B.5

7. We would like to see the NRC require a decommissioning license, just as a construction permit and an operating license are required. There will be, as in these other instances, radiation exposure hazards to the workers, to the general public in the vicinity, along transport routes, and in the region of disposal of the debris. License issuance should require an Application, an Environmental Report, a PSAR and a FSAR. The application should be given notice and the opportunity of intervention provided. For a matter with such manifest long term consequences the Environmental Policy Act must be realized in actuality as well as nominally.

C.1.3.1

F.1

8. Decontamination by chelating agents raises problems simultaneously with solving others. By making radionuclides water soluble the problem of retention in isolation is greatly increased. We propose a requirement that the chelate solution be concentrated without the escape of volatile radioactivity and the concentrate incinerated to destroy the organic chelating agent. The radioactive ash would be incorporated in a suitable form for storage as high level waste, in ceramic, glass, or concrete.

H.1.2.1

9. The linkage of decommissioning to the availability of high level waste repositories; the possible development of means for dealing with intermediate level wastes; and the generation of low level waste repositories under the compact system is direct. In the absence of repositories for the various kinds of decommissioning waste, "Safstor" will be the unavoidable procedure. It would be well for the criteria to explicitly deal with this matter.

B.3.1

H.1.1.1

H.1.1.4

10. The Criteria should be explicit and detailed on procedural criteria. It will be best if the NRC devises these criteria. It will presumably make available the best, disinterested (financially) expertise; it will remove from the applicants a needless burden which they are not established to undertake; it will reduce the number of differences requiring resolution and make for a more cost and time effective licensing process.

C.1.1

11. The Criteria should require explicit standards for radiation exposure of workers and effectuate these on a life-time basis. By relating the individual's exposure records to social security number a retrievable history of exposure would be made available to a current employer. There is no room for another "sponge" controversy.

C.1.8.1

C.1.10

12. Equipment and supplies used in a decommissioning program should be subject to specification and quality assurance procedures. This should be the case for decontamination, demolition, transport, and waste isolation. Health physics procedures and monitoring

C.6

-3-

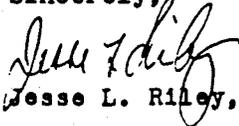
would come under the same rubric.

13. The Final Generic Environmental Impact Statement on decommissioning has not yet issued. We propose the issuance of a revised set of Criteria after issuance of the FGEIS which is in accord with it, and which will be subject to comment.

| C.6

| G.1

Sincerely,

  
Jesse L. Riley, chair

JONES NUMBER  
PROPOSED RULE  
PR-314450 et al  
M. I. LEWIS  
6504 BRADFORD TERR.  
PHILA, PA 19149  
(50FR 5600) (93)

Secretary of the Commission  
NRC

Washington, D.C. 20555

Dear Mr. Secretary:

Please Accept this letter as my comments on the Proposed Rule on Decommissioning  
for Nuclear Facilities. 50FR 5600 2-11-85.

DOCKETER  
BRANCH

85 MAY 17 10:40

There are many deficiencies on these proposed Criteria.

1. The definitions of "DECON", "RAFTOR", AND "ENTOMB" are so short and non-specific as to be meaningless. Depending on future Regulatory Guides all the decisions on the NRC staff with little chance for the public to even know what decisions are being made. The Reg Guides are not published in the Federal Register putting the knowledge of these decisions out of the reach of the average citizen and even his lawyer despite any direct effect that the Reg Guide would have on them.

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

B.2.1  
B.3.1.1

2. There are no real decommissioning standards for total worker exposure, total public exposure, total amount (not concentration) of releases and really no standards for non-radiological wastes. Inside a reactor decommissioning, EPA standards may not control - or even be invited - allowing PCP, PBB, chlorinated solvents to be disposed of haphazardly.

C.1.7

H.1.2.1

Funding assurances are not guaranteed. In fact, the proposed rule depends heavily upon the utility not maneuvering to take early profits and allow bankruptcy to avoid future risk and decommissioning costs. This maneuver of bankruptcy is promoted by assuming a very small decommissioning cost.

D.3.2.1.1 (a)

4. The most devastatingly deficient part of the rule is not mentioned in the proposed rule. Enforcement in the NRC is against those that do not commit the violation. Fines, which are the enforcement tool, are not levied against the actor or the manager. The fine is ultimately paid by the ratepayer, taxpayer or the stock holder. The actual person who committed the violation is not forced to pay the fine, and often he or she continued to work for the same company in the same position. This deficiency in enforcement is compounded because the perpetrator is removed from his act by as much as 30 or 40 years. In other words a decision that affects the decommissioning made during construction in violation of the regulatory guidance may not be discovered for forty years and fining or calling the violator to justice at that late date would often be impossible.

H.4

Respectfully submitted,  
*M. I. Lewis*

M. I. LEWIS  
6504 BRADFORD TERR.  
PHILA, PA 19149

289596  
MAY 20 1985  
Acknowledged by card.....

PP-134150 etal  
(50428600) (94)

P. O. Box 466

Pinedale, CA 93650

May 12, 1985

DOCKETER  
USNRC

75 MAY 17 10:41

Secretary of the Commission

NRC

Washington, D. C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Sir:

This is to inform you that I do not want my  
decommissioning dollars to go to phantom funds.

Therefore, I am against "internal unsegregated funds"  
and I am for "external segregated funds" which are not controlled by  
private utilities or invested in utility assets.

D.3.2.1.1(a)

Yours respectfully,

*Charles C. Williams*

(Charles C. Williams)

Suppose some  
small amount of funds

1985 MAY 20 1985  
Acknowledged by card.....

*pd*

AGENCY NUMBER  
PROPOSED RULE **PR-80-40, 50 et al (95)**  
(50 FR 5600)

Carl A. Zichella, Energy Policy Analyst  
Redwood Alliance  
P.O. Box 293  
Arcata, Ca. 95521  
(707)822-7884 (707) 822-5777

May 14, 1985

DOCKETING  
USNRC

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
Attn: Docketing and Services Branch

'85 MAY 17 10:44

To whom it may concern:

OFFICE OF SECRETARY  
DOCKETING & SERVICES  
BRANCH

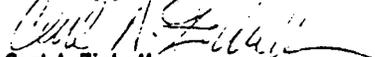
Attached please find the comments of Redwood Alliance on the Nuclear Regulatory Commission's proposed rule for Decommissioning Criteria for Nuclear Facilities, as published in the Federal Register on February 11, 1985, and affecting 10 CFR Parts 30, 40, 50, 51, 70, and 72.

On May 13th I discussed the comment period for this proposed rule with Ms. Catherine R. Mattsen of the NRC Office of Regulatory Research. Ms. Mattsen informed me that a prompt submittal of the attached comments would ensure their careful and full consideration by the Commission, despite the fact that they are being submitted after the announced deadline for comments. She further informed me that there is a possibility that the comment period would be extended. Redwood Alliance hopes that the attached comments receive the Commission's full consideration. Redwood Alliance wishes to be informed of any extension of the comment period, should we find it necessary to revise or extend our remarks. We encourage the Commission to extend the comment period if there are any organizations or individuals who wish to comment, but have been unable to complete their comments in time. This is an issue of serious import for the country, and a full dialog on the merits of the proposed rule should serve to enhance policy decisions long into the future.

G.8

Thank you for your consideration of this matter.

Sincerely yours,

  
Carl A. Zichella  
for Redwood Alliance

cc. Hon. Allan Cranston  
Hon. Douglas H. Bosco  
Mr. Brooks Yeager, Sierra Club Washington Office  
Mr. Michael Sherwood, Sierra Club Legal Defense Fund  
Ms. Sally Hindman, Public Citizen

MAY 20 1985  
Acknowledged by card.....  


J-361

## SUMMARY OF COMMENTS

1. Decommissioning Environmental Impact Statements should be required of all licensee classifications in all cases. (p.1)
2. Only DECON and SAFSTOR decommissioning alternatives should be considered acceptable for nuclear facilities. (p.2)
3. The ENTOMB option should be dropped from consideration. (p.2)
4. Site specific factors should be the determinants in deciding decommissioning alternative and timing for DECON. (p.2)
5. Near-term decommissioning should be required except in cases where extenuating circumstances--such as the presence of factors affecting public health and safety--exist. (p.2)
6. Criteria for such circumstances should be formally developed, with public input. (pp.2&3)
7. Extensive preliminary planning for decommissioning should be required. (p.3)
8. To assure the availability of funds, site specific cost estimating should be required. (p.3)
9. Cost estimates should be updated regularly to insure accuracy. (p.3)
10. Initial decommissioning plans should be required of license applicants, and early decommissioning plans should be required of licensees with operational facilities. (p.3)
11. Plans for collecting, developing, maintaining and recalling records should include indexing of such records. (p.4)
12. Final decommissioning plans should be required at least one year prior to planned termination. (p.4)
13. Financial planning for decommissioning should be required for all reactors regardless of their operational status. (p.4)
14. Advance planning for DECON of reactors in SAFSTOR should be required.
15. Residual radiation limits allowable under the law should be revised downward as research indicates a need to do so. (p.5)
16. Decommissioning cost estimates should be required of all licensees immediately, and updated periodically. (p.5)
17. Internal funding mechanisms provide an unsatisfactory level of Assurance. (p.6)
18. Internal mechanisms are placed in doubt by utility insolvency; external ones are not. (p.6)
19. \$100 million is inadequate for nuclear decommissioning. (pp.7&8)
20. Certification should be dropped from consideration. (p.8)

## **SUMMARY OF COMMENTS**

### **PAGE 2**

- 21. Only external funding mechanisms, such as prepayment and External Sinking Fund should qualify for consideration to finance nuclear decommissioning. (p.8)**
- 22. Internal mechanisms should be disregarded. (p.8)**
- 23. Assurance is the most important criteria by which funding mechanisms are judged. (p.9)**
- 24. For the NRC, cost is an inappropriate consideration of funding mechanism suitability. (p.9)**
- 25. Funding mechanisms for existing licensees should be external funds. The establishment of these funds should be required within a year at most. (p.10)**

**QED**

**COMMENTS OF REDWOOD ALLIANCE ON THE PROPOSED RULE FOR  
DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES  
MAY 14, 1985**

The Redwood Alliance, a public interest, community supported organization concerned with energy, environmental and rate issues, has the following comments on the Nuclear Regulatory Commission (NRC) proposed rule setting forth decommissioning criteria for nuclear facilities.

It is gratifying that, at long last, there is some guidance from the NRC regarding the retirement of nuclear facilities. This is, as PIRG and others noted in their original petition for decommissioning rulemaking eight years ago, a mounting problem. Redwood Alliance has some serious concerns, however, with some of the rule's provisions, and we feel that in some cases these provisions may defeat the avowed purpose of their intent. This is particularly true in the areas of assurance and environmental impact assessment.

A point-by-point critique:

ISSUES ADDRESSED:

The proposed rule set forth five issues related to decommissioning it would address: decommissioning alternatives, timing, planning, financial assurance, and residual radioactivity. Redwood Alliance strongly disagrees with the statement, "it became apparent that environmental review requirements could be reduced." We feel that there is little in the experience of nuclear facilities that suggests that even existing environmental review requirements suffice. On the contrary, nuclear licensees have shattered public confidence in their ability to safely and responsibly handle their environmental obligations thus far. In such a complicated and potentially dangerous process as nuclear decommissioning, where large quantities of highly radioactive materials must be removed, shipped, and where extensive chemical decontamination efforts will be necessary, more stringent, indeed the most stringent environmental assessment requirements should be mandated, such that full public participation is encouraged. Environmental Impact Statements should be required of *all* licensee classifications in *all* cases.

G.1

F.1

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

**DECOMMISSIONING ALTERNATIVES:**

Redwood Alliance feels that only the DECON and SAFSTOR decommissioning alternatives should be considered as acceptable for nuclear facilities. In the case of power reactors, the ENTOMB option is inadequate in our view, to ensure long-term isolation of radiation from the environment and to ensure public health and safety. We favor options which require regulatory oversight of less than 50 years, and ideally less than 30. The quandaries of nuclear waste disposal will be with us for millenia. It is foolhardy to assume a continued interest in the management of retired facilities by utility companies (presumably holding "possession-only" licenses) who are realizing no financial return on them. The government then, will at some point have to assume control of these facilities. It may even be unduly optimistic to assume that government will be eager to assume such responsibility a century or more into the future, given financial and policy constraints. The public interest then is best served by decommissioning alternatives which reach conclusion less than 30-50 years after cessation of operations. ENTOMB does not fulfill this requirement. It is unlikely, given the presence of activation elements in the steel and concrete of reactor vessels and shrouding, that delayed dismantlement can be avoided in the ENTOMB option. NRC discussion on the proposed rule acknowledges the increased difficulty and cost of such a delayed dismantlement effort. The ENTOMB alternative should be dropped from consideration.

B.5

B.4.3

B.5

**TIMING:**

Redwood Alliance agrees that site specificity should be the determining factor in deciding the alternative and timing of DECON. It is prudent to consider the possibility of SAFSTOR in individual cases where safety considerations dictate. Early decommissioning is the optimum choice in all other instances. As noted in the NRC discussion of the proposed rule "a review of the technical data base shows that, for DECON, occupational exposure rates can be kept reasonable." Long-lived activation elements would preclude any advantage being realized in this area if deferral exceeds 30-50 years. Therefore, near term decommissioning should be required except in cases where extenuating circumstances exist. Criteria for such circumstances

B.4.2

B.3.1.1

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

should be developed, in the form of a proposed rule, or guidance document for this rule.

B.3.1.1

**PRELIMINARY PLANNING:**

Redwood Alliance feels that extensive preliminary planning for decommissioning should be required. As discussion on the proposed rule notes, financial assurance planning should be an early and oft-reviewed function. Decommissioning efforts will be severely hindered by any shortfall of funds. Cost estimates should not, however, be based upon so-called "generic" models, completed 2-5 years ago and which have little basis in present reality. These models have value only in providing the format by which site specific cost estimates may be arrived at.

C.2.1

D.4.3

D.8.1

Site specific cost estimates should be required if assurance goals are to be met. Regional differences in labor, materials, inflation and escalation rates and other costs, will play a very substantial role in creating a wide disparity in actual decommissioning costs.

D.2.1.(a)

Site specific cost estimates should be updated regularly to insure accuracy. Redwood Alliance supports the proposed rule's requirement in this area, but suggests further that more regular intervals (before 5 years before decommissioning) be required for estimate review and revision, to ensure that sufficient funds for decommissioning are being collected in advance. This guarantees fairness to ratepayers, who would otherwise suffer an unnecessary increase of payments in later years of the reactor's life if large adjustments become imperative to ensure the availability of funds for decommissioning.

D.4.3

Initial decommissioning plans should be required during submission for license applications. Decommissioning is best planned at the time reactors are designed and planned for operation. Consideration of decommissioning during the installation of a reactor could greatly facilitate its later retirement. Too little attention has been afforded this fact in the past, the consequences of which have yet to be fully realized. That lacking, an early decommissioning plan, complete with operational data and facility incident and accident information, periodically updated and reviewed, would provide the best approach for safe decommissioning for reactors which are already operational. Procrastinating until just before, or worse, just after decommissioning could create an atmosphere where the possibility for error and/or miscalculation is enhanced.

C.2.1

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

Redwood Alliance supports the rule's requirement mandating the development of plans for developing, collecting, maintaining, and recalling records and archive files which include as-built and as-revised drawings, specifications and operational occurrences which could significantly effect decommissioning. Moreover, these should be made public. The rule further specifies that indexing of each individual document will not be required, further stating that the intent of the rule is to *assure that all important information is kept until termination of license and that it be readily accessible when needed.* Indexing would appear to enhance that goal. Indexing of documents should be required.

C.7.1

C.7.3

C.7.4

**FINAL PLANNING**

Redwood Alliance feels that final decommissioning plans should be required of licensees one year prior to planned termination. This should be required of all licensee classifications. For reactors which have shut down prior to the effective date of the final rule, the NRC should require that decommissioning plans be immediately promulgated. This should be done to ensure that full consideration will be given to the technical and financial requirements of decommissioning in advance of license termination. Ideally, planning for decommissioning should have been done at the time licenses were originally applied for. Regulatory negligence and industry indifference were the reasons this was not done. This rule should be seeking to rectify this situation. Allowing a deferral of decommissioning planning until such time as an application for license termination is submitted, as the proposed rule would, is not sound regulatory policy and inimical to the public interest. In particular, financial planning for decommissioning should be mandated for all reactors, regardless of their operational status.

C.2.3

C.9

C.2.1

For plants placed in SAFSTOR with delayed DECON, decommissioning planning should not be deferred into the future. Although technological improvements in the decommissioning process are inevitable, it is unlikely that all advance planning will be rendered useless. Rather, it is likely that innovations can be tailored to be incorporated into existing plans, and that the corresponding cost savings or increases that may result may be more accurately reflected in cost estimates over the accrual period. Adjustments needed to the fund can then be more precisely made. In this way advance

C.10

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

needed to the fund can then be more precisely made. In this way advance planning can enhance both assurance and public health and safety. Advance planning for DECON for reactors in SAFSTOR should be required.

C.10

**ELEMENTS OF DECOMMISSIONING PLANS:**

**1. Decommissioning Alternative**

We support the components of this analysis, with more detail, and assuming that, as mentioned above, ENTOMB is not a viable option.

B.3.1.1  
B.4.2

B.5

**2. Technical and Environmental plans**

As noted above, an Environmental Impact Statement should be required.

F.1

**3. Terminal radiation survey**

We support the components of this analysis with continued research into the effects of low-level radiation. Residual radiation thresholds should reflect conservative estimates of exposure such that the public health is safeguarded at sites released for unrestricted use. Residual radiation limits allowable under the law should be adjusted downward as research indicates a need to do so.

E.1.1

**4. Cost Estimate**

Decommissioning cost estimates should be required of all licensees immediately, and updated periodically. Plans and estimates should not be deferred until applications for license termination are submitted. As discussion on the rule notes, advance submission, and NRC consideration of decommissioning plans can expedite decommissioning activities following the end of facility operations.

D.4.3

D.4.1.1

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

**FINANCIAL ASSURANCE:**

**Internal funding mechanisms provide an unsatisfactory level of assurance that funds will be available for decommissioning. External funding mechanisms, either Prepayment or external Sinking Fund methods provide a higher level of assurance than do internal mechanisms. When coupled with insurance and/or surety protection, they are not placed in a shortfall position by premature shutdown.**

**Internal funding mechanisms are placed in doubt by utility insolvency; external mechanisms are not. Utility insolvency, once believed to be nearly impossible, is a distinct possibility today. Many utilities are overly obligated to nuclear technologies, and the lack of diversity has put them at risk. Noteworthy among these is Long Island Lighting Company (LILCO) of New York. LILCO officials have stated publicly that the company would fold if its \$4.2 billion Shoreham plant does not reach the rate base. There are questions about the adequacy of the facility's construction and quality control programs. Should the reactor go "on-line" and enter the rate base, LILCO's problems would not cease. Rates will skyrocket, conservation increase, and despite the increased rates, utility revenues dwindle. Any accident could so severely damage the company that insolvency would be a foregone conclusion.**

**And LILCO is not alone. Most utilities in the U.S. are not greatly diversified. Fear of being placed in LILCO's shoes has convinced a number of utilities to abandon major nuclear projects, among them Midland 2 (Consumers Power), Zimmer 1 (Cincinnati G&E, Columbus and Southern Ohio Electric Co., and Dayton P&L), and Marble Hill 1&2 (Public Service of Indiana, Wabash Valley Power Assn.). The accident at Three Mile Island has made believers of many utility executives, who realize that the horrendous costs associated with nuclear accidents could mean the end of the line for their companies. The municipal bond debacle at WPPSS in Washington State has had a similarly chilling effect on municipal utilities.**

**What would become of decommissioning funds held in internal funding accounts? Decommissioning funds so collected are typically invested back into the utility company, as plant or for operating costs. Such money is not discernable from other utility assets, and is likely to be attached by creditors in the scramble that would inevitably follow a utility's failure. Such a situation, not only possible but probable in a bankruptcy situation, would endanger the public health and safety by destroying a given utility's ability to pay for decommissioning.**

D.3.2.1.1(a)

D.3.2.2.1

D.3.2.1.1(a)

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

What could potentially amount to hundreds of millions of dollars for decommissioning--ratepayer contributions and the earnings on that money-- could be lost in the fallout following utility default. The public would then be subjected to a sort of "double whammy," with decommissioning delayed and the potential for health and safety difficulties, and having to pay again for decommissioning.

D.3.2.1.1(a)

Further discussion on funding mechanisms follows.

Mechanisms for Requiring Financial Assurance :

Certification of \$100 million for decommissioning:

The figure of \$100 million is inadequate for decommissioning the "second generation" of U.S. power reactors. This figure may, in fact, prove to be too low for even the first generation of power reactors. The Elk River reactor, for instance, cost more to decommission than it did to build. The Shippingport reactor in Pennsylvania is predicted to cost fully \$80 million to dismantle, yet it is only one-tenth the size of today's reactors, and built to far less rigorous specifications. Similarly, the Humboldt Bay reactor in northern California is estimated to cost nearly three times its construction cost to decommission. Humboldt Bay cost approximately \$21 million to construct, and will take an estimated \$61.5 million to decommission--if estimates are accurate, and there is little in the way of historical justification to indicate that they will be. Indeed, the record tells quite a different tale.

D.2.1(a)

Public policy analyst Carole Douglis, in a 1984 article in the *Atlantic Monthly*, quotes one Rand Corporation study which indicates that costs for untried technologies, such as nuclear decommissioning, typically climb to between 400 and 1000% of the costs originally predicted. Experience with the construction phase of nuclear power development seem to bear this out. A February 1985 survey of 35 new nuclear power projects done by *Forbes* magazine indicated that construction costs for these projects ranged from six to eight times the amount expected. If decommissioning estimates are as inaccurate as construction estimates have been, decommissioning could run into the tens of billion of dollars as opposed to the \$100 million the NRC suggests is sufficient. As Cornell University

D.1.1.1

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

economist Duane Chapman has stated, " It will cost as much to dismantle the plants as it did to build them-- I think on average \$3 billion apiece in today's terms...Given a six percent inflation rate, a reactor going on-line today will cost seventeen billion dollars to dismantle in 2014."

**The \$100 million Certification is inadequate to assure the availability of funds for decommissioning. The cost escalation problems noted above may prove to be analogous for other licensees as well as for reactor operators. Stating that the regulation could be modified at a later time, should the need arise, does not address the issue of assurance. Only site specific estimates, periodically adjusted as needed can project decommissioning costs with reasonable accuracy (provided the assumptions are realistic). The Certification method should be dropped from consideration.**

**Funding Methods:**

As discussed above under FINANCIAL ASSURANCE, page 6, only external funding mechanisms such as Prepayment and External Sinking Fund should qualify for consideration to finance nuclear decommissioning. Internal reserve, as the NRC discussion on the rule notes, is vulnerable to "events or situations that undermine the financial solvency of a licensee." Coupling the reserve with some form of insurance or surety will help, but the internal reserve mechanism is still deficient in ability to assure the availability of funds for decommissioning when compared to the external mechanisms.

There may be some question as to the availability of such insurance for many licensees experiencing financial difficulties, such as those resulting from construction cost overruns experienced in advance of reactor operation. Similarly, insurance may not be an option for those licensees who have experienced numerous incidents and accidents in the operating history of presently running reactors. One can expect a degree of reticence on the part of an insurer to provide coverage for such utilities as Commonwealth Edison. The up-front risk of default may simply be too hard to swallow. If the goal is to provide assurance that funds for decommissioning will be available, then Internal mechanisms must be disregarded.

D. 1.1.1

D. 2.1(a)

D. 3.2.2.1

D. 3.2.1.1(a)

D. 3.2.2.1

D. 3.2.1.1(a)

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

**Criteria for Funding Mechanisms:**

Of all criteria used to judge the suitability of a particular funding mechanism for decommissioning, Assurance is paramount. The NRC is correct when it states that its primary responsibility is to protect the health and safety of the public. All other considerations must be subordinate to this one. Assuring the availability of funds for decommissioning is critical to protecting the public health and safety, as safety related decommissioning activities could be delayed if funds are not available to pay for the work. By the NRC's own analysis, the Prepayment and External Sinking Fund options provide the highest degrees of Assurance of the considered mechanisms. They therefore best protect the health and safety of the public.

Assurance for the External Sinking Fund can be further enhanced by structuring the payment schedule such that more money is collected in the earlier years of the fund, or by coupling it with a deposit, insurance, or surety protection.

For the NRC, cost is an inappropriate consideration of funding mechanism suitability. As noted in the NRC discussion, State Utilities Commissions have traditionally set retail rates enabling the utilities to recover the cost of electricity production, plus realize a return on investment. As decommissioning is an ancillary cost of that production, it is within the purview of the state Commissions to address the recovery of decommissioning costs from the ratepayers. The State Commissions may be far better equipped than the NRC to do so. In addition to the criteria of Assurance and Cost, these Commissions consider additional criteria. These include Equity (fairness to ratepayers in assigning charges and cost recovery schedules), and Flexibility (the adaptability of a fund to change).

The NRC's approach is only a partial consideration of the issues, and strays from the primary mandate it is bound to-- safety. It is arguable that any decision on financing nuclear decommissioning should be left to State Commissions.

It should be noted that at least one study cited in this rule (NUREG/0584, Assuring the Availability of Funds for Decommissioning, Robert S. Wood) indicates that cost is of minor importance regarding decommissioning financing. According to the abovementioned study, "despite the difference in cost of the three plant-specific funding alternatives [prepayment, external and internal sinking funds] found by most of the studies under many assumed conditions, the overall impact on increased revenue requirements--ie. the ratepayer's bill--of the most expensive options is estimated to be less than 1%" (Rev. 2, p.37).

D.3.2.1.1(a)

D.3.2.2.1

D.3.2.1.2

**COMMENTS OF REDWOOD ALLIANCE May 14, 1985  
DECOMMISSIONING CRITERIA FOR NUCLEAR  
DECOMMISSIONING: PROPOSED RULE**

Periodic Review:

Redwood Alliance supports the rule's provisions requiring periodic review of decommissioning plans for funding adequacy. review intervals, however, should be prescribed to ensure at least a minimal degree of updating over the life of a fund.

D.4.3

Existing Licensees:

Funding mechanisms for existing licensees should be external funds. The establishment of such funds should be required within a year at most. There appears little justification for delaying the development of a fund for decommissioning when a shorter time frame exists for the accumulation of sufficient amounts of capital.

D.4.1.1

Extended Decommissioning Period:

For facilities in SAFSTOR, funds should be External Sinking Funds in all cases, regardless of surety, insurance or other options. In no case should the fund be an Internal Fund or Certification. As discussed above in some detail, Internal Funds and Certification provide an unacceptably low level of assurance relative to the external methods. As there is no incentive for utilities to provide for decommissioning in SAFSTOR cases, and stability of the utility might be in doubt, it is especially important to ensure that the fund is the most rigidly protected.

D.3.4



PR-30498 et al  
(50 FR 5600) 96

# Texas Department of Health

Robert Bernstein, M.D., F.A.C.P.  
Commissioner

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Austin, Texas 78756-3189  
(512) 458-7111

DOCKETED  
USNRC

Robert A. MacLean, M.D.  
Deputy Commissioner  
Professional Services  
Hermas L. Miller  
Deputy Commissioner  
Management and Administration

Radiation Control  
(512) 835-7000

85 MAY 17 10:49

May 10, 1985

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

ATTN: Docketing and Service Branch

Dear Sir:

Thank you for the opportunity to comment on proposed changes to 10 CFR Parts 30, 40, 50, 51, 70 and 72 regarding decommissioning criteria for nuclear facilities. Staff of the Bureau of Radiation Control have reviewed the document and offer the following comments:

- 1) The lower limits on the quantity of radioactive material established in paragraph 30.35 (c) as criteria for financial assurance may, in some cases, be too restrictive. For example, the amount of Americium-241 in unsealed form which would require financial assurance of at least \$500,000 is 10 millicuries.
- 2) The requirement for a permanent record of spills and other unusual occurrences is a necessary one. It is likely that the personnel responsible for decommissioning at the closure of a facility will not include all the individuals who opened or operated the plant. Records are a valuable tool in this regard. Moreover, knowing the history of a facility will enable licensees to decommission a facility in a timely and scientific manner with adequate financial resources being provided "up-front."

D.6.3

C.7.1

If you have any questions concerning these comments, please contact us.

Yours truly,

David K. Lacker, Chief  
Bureau of Radiation Control

cc: Donald A. Nussbaumer  
Office of State Programs

Acknowledged by card MAY 20 1985

PK

PROPOSED RULE PR-30,40,50 et al (50 FR 5600) (97)

Omaha Public Power District  
1623 Harney Omaha, Nebraska 68102  
402/536-4000

May 13, 1985  
LIC-85-200

DOCKETED  
USNRC

'85 MAY 17 AIO:50

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Mr. Samuel J. Chilk  
Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

ATTN: Docketing and Service Branch

Reference: Docket No. 50-285

Dear Mr. Chilk:

Notice of Proposed Rule Regarding  
Decommissioning Criteria for Nuclear Facilities,  
50 Federal Register 5600, dated February 11, 1985

The subject notice requested comments on a series of amendments to 10 CFR intended to set forth technical and financial criteria for decommissioning licensed facilities. The Omaha Public Power District, holder of Facility Operating License DPR-40, and owner/operator of Fort Calhoun Station, Unit No. 1, offers the following comments.

We believe, as a general comment, that the rule should contain a provision which would allow the individual licensee to submit different plans for decommissioning to the NRC for approval. We also wish to endorse the comments made by LeBoeuf, Lamb, Leiby & MacRae.

C.4.3

The comments are concerned with Issue D, as stated in the "Description of Policy and Proposed Rule."

D. Financial Assurance

1. Although the proposed rules do provide for individual facility-specific cost estimates, the use of these individual studies should be encouraged more positively by the decommissioning rules. Accordingly, the arbitrary estimate of \$100,000,000 (1984 dollars) for a decommissioning funding should be limited to a fall back position where a utility has failed to make its own study.

D.2.1(a)  
D.2.1(b)

Acceptable decommissioning studies should include the three major approaches that are in general use. The first is to conduct, as with construction estimates, a detailed step-by-step assessment of the tasks and activities to decontaminate, secure, place in storage, and/or dismantle a specific plant. The second method is to take an existing estimate and adjust it for regional effects, differences in the plant, and inflation in costs with time. The third is to scale costs from actual decommissioning experience.

Acknowledged by card..... MAY 20 1985  
*[Signature]*

Employment with Equal Opportunity  
Male/Female

Important factors that should be considered in planning are:

- a) Regional variation in labor rates
  - b) Amount of reinforcing in concrete structures
  - c) Size of plant
  - d) Type of plant
  - e) Plant operations during its lifetime
  - f) Availability and location of waste disposal sites
  - g) Use of an appropriate cost escalator that reflects regional price levels, such as the Handy-Whitman Index of Public Utility Construction Costs by region
  - h) A periodic evaluation review of the base cost estimate to account for changes that may affect the base estimate. Such items include: technological change; adjusting of price escalator; base assumptions review; the waste disposal environment, and all other factors that have cost impact which may have changed since the previous review. Periodic evaluations should be made every three to five years.
2. In the proposed rule, the Nuclear Regulatory Commission requires an annual cost escalator of two times the Consumer Price Index (CPI) applied to the decommissioning cost estimate. Both the index and the multiplier used with it are strongly recommended for reconsideration.

The use of the CPI for decommissioning cost escalation is not appropriate. This index is composed of factors intended to relate to consumer retail markets and have only an indirect impact on costs associate with nuclear plant decommissioning.

Although no perfect decommissioning index has been found, the Handy-Whitman Index of Public Utility Construction Costs appears to be more appropriate and is in general use in the utility industry. This index is certainly not a "destruction" index, but it shares many common factors with those that escalate the decommissioning cost. In addition, Handy-Whitman is available on a regional basis. The availability of local cost information provides a strong argument for this index because regional cost differences are very significant in making decommissioning cost estimates.

D.2.1(a)

D.4.3

D.2.1(a)

D.2.1(b)

Multiplication of the CPI by a factor of two appears to provide for uncertainty in the total decommissioning cost estimate. Uncertainty in the total decommissioning estimate is limited to aspects connected with storage and disposal of high-level radioactive waste. Much of the remaining decommissioning cost estimate involves available technology which can be estimated accurately today, subject only to normal price escalation. Uncertainty in the decommissioning estimate should be accounted for by the estimate itself.

A multiplier on the index does not provide a satisfactory way to account for those cost components which cannot be estimated accurately at the origination of the base estimate. Changes in the costs of each component that varied from normal escalation would be made on a three to five year review schedule. Accordingly, periodic reviews would be much more accurate than the arbitrary multiplier on the escalation over a period of years.

In summary, it is recommended that the Handy-Whitman Index of Public Utility Construction Costs be used rather than the Consumer Price Index and the multiplier effect of any index be eliminated in favor of a procedure requirement for periodic reviews of the base estimate using a review cycle of three to five years.

The Omaha Public Power District respectfully requests your consideration of these comments.

Sincerely,

*R L Andrews for*

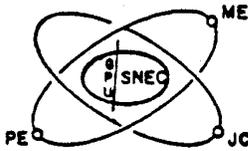
R. L. Andrews  
Division Manager  
Nuclear Production

RLA/DJM/dao

cc: LeBoeuf, Lamb, Leiby & MacRae  
1333 New Hampshire Avenue, N.W.  
Washington, DC 20036

D.2.1(a)

D.2.1(b)



**SAXTON NUCLEAR EXPERIMENTAL CORPORATION**

**GENERAL PUBLIC UTILITIES SYSTEM**

**JERSEY CENTRAL POWER & LIGHT COMPANY  
PENNSYLVANIA ELECTRIC COMPANY  
METROPOLITAN EDISON COMPANY**

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DOCKET NUMBER  
PROPOSED RULE **PR-304950 et al**  
**(50 FR 5600) (98)**

TELEPHONE:  
201-263-6500

'85 MAY 17 11:03

May 13, 1985  
SNEC 85-020

OFFICE OF THE  
SECRETARY  
BRANCH

Mr. Samuel J. Chilk  
Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Dear Mr. Chilk:

Subject: Request for Comments on Decommissioning  
Criteria for Nuclear Facilities Proposed  
Rule

The Saxton Nuclear Experimental Corporation herewith submits comments on the subject proposed rule. Comments were requested in a February 11, 1985 Federal Register notice (50FR5600).

Saxton Nuclear Experimental Corporation endorses the comments sent to the Commission by the Atomic Industrial Forum Subcommittee on Decommissioning. We find these comments to be comprehensive and complete.

Saxton Nuclear Experimental Corporation suggests that the Commission codify the concept of "possession only" licenses within 10CFR. This would clarify the time frame within which licensees would be able to reduce the requirements of such items as the Security Plan, Emergency Plan, Operator Requalification Training, and other requirements of the standard Class 103 license, all of which now are done on a case-by-case basis, via Regulatory Guide 1.86.

C.1.6

Very truly yours,

Saxton Nuclear Experimental Corporation

*Michael B Roche*

Michael B. Roche  
Vice President

MBR/brh

~~SECRET~~ ~~PROPOSED RULE~~ PR-80-40, 50 et al  
(50 FR 5600) (99)

**Southern California Edison Company**

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ROSEMead CALIFORNIA 91770

DOCKETED  
USNRC

M. O. MEDFORD  
MANAGER NUCLEAR LICENSING

May 13, 1985

'85 MAY 17 AM 1:15

TELEPHONE  
(619) 492-1748

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Mr. Samuel J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
1717 H Street  
Washington, D.C. 20555

Subject: NRC proposed rule on decommissioning

Dear Mr. Chilk:

In response to the NRC Proposed Rule entered in the Federal Register on February 11, 1985, SCE offers the following two comments.

It is requested that the final rule recommend that site specific cost estimates for dismantling and decommissioning nuclear power plants be used instead of generic studies, and that generic cost estimates only be used when no site specific study has been performed. Additionally, generic cost estimates should only be utilized with the provision that the unique characteristics of the nuclear unit and site be taken into consideration. Furthermore, the NRC should clearly state that such a general estimate represents only a rough approximation for the cost of decommissioning. Further, SCE endorses the comments of the Utility Decommissioning Group and the Subcommittee on Decommissioning of the Atomic Industrial Forum.

D.2.1(a)

D.2.1(b)

Since the intent of the Proposed Rule is to assure that safe decommissioning of nuclear facilities will be accomplished and that adequate funds will be available for this purpose, and because technology exists to accomplish the decommissioning of nuclear facilities, this fact need not be demonstrated by the licensee in the decommissioning plan. The decommissioning plan should not be a license condition, but rather, the plan should be submitted to the NRC subsequent to the issuance of the operating license.

C.4.4

C.4.5

If you have any questions or comments, please contact me.

Very truly yours,

*M. O. Medford*

Georgia Power Company  
333 Piedmont Avenue  
Atlanta, Georgia 30308  
Telephone 404 526 6800

Mailing Address  
Post Office Box 4545  
Atlanta, Georgia 30302

**William L. Westbrook**  
Senior Vice President  
Accounting and Finance  
and Secretary

May 15, 1985

DOCKETED

'85 MAY 17 AM 11:56

Mr. Samuel J. Chilk  
Secretary of the Commission  
Attention: Docketing and Service Branch  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Re: Proposed Decommissioning Criteria for Nuclear  
Facilities (50 FR 5600)

Dear Mr. Chilk:

Georgia Power Company is pleased to offer its comments  
on the Nuclear Regulatory Commission's proposed nuclear  
decommissioning rule, specifically on the topic of financial  
assurance. Attached are said comments.

Sincerely,

*W. L. Westbrook*  
W. L. Westbrook

WLW:bjw

Attachment

DOCKET NUMBER  
PROPOSED RULE **PR-30,40,50 et al**  
**(50 FR 5600)** **(100)**

COMMENTS ON PROPOSED NRC RULE,  
DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES

Georgia Power Company is pleased to offer its comments on the Nuclear Regulatory Commission's proposed nuclear decommissioning rule, primarily as it concerns the topic of financial assurance.

With regard to the Commissioners' concerns permitting the use of unsegregated internal funding, Georgia Power Company strongly supports the inclusion of the internal reserve method as a funding alternative. The Company agrees with the NRC staff's position that the internal reserve method provides a reasonable assurance of funding capability by allowing utilities to invest in company assets. In Georgia Power's case, this investment earns a higher rate of return than may be achievable if an external fund or prepayment method were used. Since internal funding costs less to administer than the other methods, significant savings can be realized over the operational life of the plant. Therefore, ratepayers receive the benefit of lower electrical rates than may otherwise result by using the alternative funding methods. Since none of the other funding alternatives provide a combination of a) savings to the ratepayer, b) financial flexibility to the utility, and c) reasonable funding assurance, to the degree provided by the internal reserve method, Georgia Power strongly supports the inclusion of the internal funding method as an option.

D. 3. 2. 1. 1 (b)

The Company recognizes, however, that all utilities are not financially equivalent and that certain utilities may be subject to greater financial vulnerability. Georgia Power believes that the NRC has addressed this point adequately for electric utilities by allowing for the internal reserve method, while recognizing that the insurance separately required by 10 CFR 50.54(W) provides assurance in reducing uncertainties about the availability of funds. Furthermore, the requirements that decommissioning funding plans contain provisions for periodic review and adjustment over the life of the facility, and that an updated cost estimate be submitted five years prior to the projected end of operation - all of which is subject to NRC review - provide an even greater level of assurance that the funding methods and amount are both accurate and adequate.

D.3.2.2.1

D.3.2.1.1(b)

D.3.2.1.2

Georgia Power believes that the current federal tax law does not provide adequate financial incentive for utilities to externally fund nuclear decommissioning costs. The internal reserve method, more so than any other funding alternative, best adapts to current federal tax law. The passage of additional federal tax laws could provide incentives for a utility to adopt a segregated, external fund method. Such incentives could include current year tax deductions for entire decommissioning contributions to a qualified segregated fund and tax exemptions of any resulting earnings.

D.5

Although not specifically addressed in the proposed rule, there are other related issues which are of concern to Georgia Power Company. First, the Company recognizes that the proper ratemaking treatment of the costs arising from any nuclear decommissioning technique and funding method is essential. Improper ratemaking treatment can affect not only the specific utility involved but other utilities due to the regulatory and legal procedures established. To ensure equity to the utility, state regulatory commissions must allow the proper recovery of costs incurred.

D.8.3.1

D.3.2.2.4

A second and related topic concerns licensees who share ownership interests in a nuclear facility. If the co-owners are all investor-owned utilities, consistent state regulatory treatment may become an issue. In the instance where co-owners are municipalities, cooperatives and investor-owned utilities, regulatory treatment, or the absence thereof, must be recognized as a potential issue. Georgia Power suggests that the planned regulatory guidelines specify freedom of funding alternative selection among co-owner licensees. The Company supports the use of any one of the four funding alternatives for co-owner licensees and believes reasonable financial assurance can be given through the combined total of the four funding methods available to the co-owners.

D.4.5

The NRC requests comments on whether to set a prescribed amount as the basis for the level of financial assurance (i.e., the amount of \$100 million adjusted for inflation at a rate of twice the Consumer Price Index, per nuclear reactor). Georgia Power prefers the facility-specific cost estimate as the basis on which to fund decommissioning costs. A prescribed amount potentially could lead to inaccuracies in the decommissioning fund. If ratemaking treatment allowed only the prescribed amount on the basis that it is the amount referenced by the NRC, utilities with greater amounts may face disallowance of appropriate, realistic decommissioning costs. Therefore, Georgia Power Company suggests that the licensee be allowed to provide a certification using a facility-specific cost estimate as the basis for the level of financial assurance. However, if the NRC adopts any prescribed amount as the basis for the level of financial assurance, an inflation rate consistent with the base Consumer Price Index is more appropriate. While an inflation rate twice that of the Consumer Price Index may represent past trends in decommissioning costs, Georgia Power believes it is not indicative of future trends.

D.2.1(a)

D.2.1(b)

D.2.1(a)

With regard to the issue of timing, Georgia Power would like to emphasize that many nuclear power installations have two or more reactors on site, each having a license under 10 CFR 50 with different expiration dates.

B.4.2

The development of the final decommissioning rule should specifically allow for this timing difference. Inter-connection of common systems and buildings on multiple reactor sites would not allow for an efficient and straight-forward decommissioning until all spent fuel is offsite. The rule should also recognize that the presence of an operating unit or spent fuel on the site reduces the urgency in the decommissioning of the shut down plant.

B.4.2

As a final point, Georgia Power has also reviewed the Atomic Industrial Forum's (AIF) comments on the proposed rule and agrees with the comments on the issues Georgia Power does not specifically address.

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Telephone 205 783-6090

R. P. McDonald  
Senior Vice President  
Furtridge Building

DOCKET NUMBER  
BORROWED TITLE PR-30,40,50 et al  
(50 FR 5600) (101)



Alabama Power

DOCKETED  
NRC

May 15, 1985

'85 MAY 17 11:55

OFFICE OF THE  
DOCKETING AND SERVICES  
BRANCH

Mr. Samuel J. Chilk  
Secretary of the Commission  
Attention: Docketing and Services Branch  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Re: Proposed Decommissioning Criteria for Nuclear Facilities (50 FR 5600)

Dear Mr. Chilk:

Alabama Power Company (Alabama) is pleased to offer its comments on the Nuclear Regulatory Commission's proposed rule on Decommissioning Criteria for Nuclear Facilities. Alabama has also reviewed the Atomic Industrial Forum's (AIF) comments on the proposed rule and agrees with them except as noted herein.

The proposed amendments to Title 10 of the Code of Federal Regulations address decommissioning planning needs, funding mechanisms, and environmental review requirements and specifically omit the issue of residual radioactivity levels acceptable for the release of property for unrestricted use. Alabama generally agrees with the NRC's proposals on environmental review requirements. The following comments are offered on funding mechanisms and the timing of these mechanisms. These comments are suggested as improvements to the proposed rule so the final rule may be as reasonable and equitable as possible for all concerned parties.

The Nuclear Regulatory Commission's (NRC) proposed amendments require each non-government licensee to provide financial assurance for decommissioning. The NRC also allows the licensee the ability to use an alternative funding method if the licensee can demonstrate that the alternative method provides comparable assurance. Alabama fully endorses the inclusion of the internal reserve method as a designated funding method for an investor-owned electric utility in the proposed amendments.

F.1

D.3.2.1.1(b)

The NRC considered two primary criteria in evaluating funding methods - the degree of assurance of the availability of funds and the cost of providing assurance. Alabama agrees that the internal reserve funding method performs adequately under both of these criteria. The internal reserve method is clearly an economical means of providing financial assurance. It is the least expensive of the four funding alternatives because of the company's ability to reduce revenue requirements by investing decommissioning contributions in its own assets. In an external funding method such as the prepayment or external sinking fund methods, decommissioning contributions are placed in a segregated fund comprised of high grade government and municipal securities. The surety or insurance method is more expensive than the other type methods due to the additional cost incurred above the normal decommissioning expense to purchase insurance or a surety bond.

D.3.2.1.1(b)

Consideration should be given licensees who share ownership interests in a nuclear facility. If the co-owners are all investor-owned utilities, consistent state regulatory treatment may become an issue. In the instance where co-owners are municipalities, cooperatives and investor-owned utilities, regulatory treatment, or the absence thereof, must be recognized as a potential issue. Alabama suggests that the planned regulatory guidelines specifically state that co-owner licensees may adopt different funding alternatives and funding amounts based on their percent of ownership.

D.4.5

Although the NRC considers the degree of assurance to be the most important criterion in selecting a funding method, it is not the only factor which must be considered. The cost of providing assurance is also of critical importance, particularly when viewed from the state utility commission perspective. It is the responsibility of state utility commissions to ensure that ratepayers are equitably charged for the services which they receive. Thus, these commissions may consider significant cost differences between funding options to be of major importance.

D.8.3.1

The purpose of a funding method is to provide reasonable assurance of the availability of funds. There must be a balancing between assurance and the cost of providing that assurance. For those companies which qualify under the rule, the internal reserve funding method provides a reasonable degree of assurance for decommissioning and it does so at a reasonable cost. Furthermore, the requirements that decommissioning funding plans contain provisions for periodic review and adjustment over the life of the facility, and that an updated cost estimate be submitted five years prior to the projected end of operation - all of which is subject to NRC review - provide an even greater level of assurance that the funding methods and amount are both accurate and adequate.

D.3.2.1.1(b)

D.3.2.1.2

The proposed rule contains an option for the submittal of a decommissioning funding plan or a certification that financial assurance for decommissioning will be provided in an amount at least equal to \$100 million (1984 dollars) adjusted annually at a rate of twice the Consumer Price Index. Alabama strongly believes that the specification of a dollar value for the total decommissioning cost is inappropriate in a rulemaking. Each utility can prepare a facility-specific cost estimate that reflects the unique situation at their plant. The utilization of these estimates would greatly reduce the potential for over or under collection of the money for decommissioning.

D.2.1(a)

In order for facility-specific cost estimates to be realistic, specific detailed technical criteria must be developed to clarify acceptable decommissioning alternatives. Of particular concern to Alabama, as also noted in the AIF comments, is the implication in the Supplementary Information that entombment may be precluded as a viable option. Alabama strongly urges the Commission to expedite its current development efforts on decommissioning alternative requirements and residual radioactivity level limits in order that more accurate decommissioning estimates can be developed.

B.3.1.1

B.5

E.1.1

Many nuclear power installations have two or more reactors on site, each having a license under 10 CFR 50 with different expiration dates. The development of the final decommissioning rule should specifically allow for this timing difference. Interconnection of common systems and buildings on multiple reactor sites would not allow for an efficient and straight-forward decommissioning until all spent fuel is offsite. The rule should also recognize that the presence of an operating unit or spent fuel on the site reduces the urgency in the decommissioning of the shut down plant.

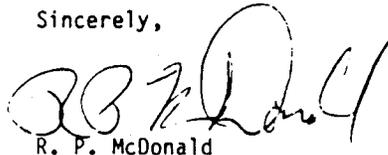
B.4.2

In conclusion, Alabama generally supports the AIF's comments as noted above and the NRC's decision to include the internal reserve method in its proposed amendments as a designated funding method for electric utilities. It is Alabama's belief that the internal reserve funding method will provide a reasonable degree of assurance of availability of decommissioning funds and will provide that assurance in the most cost efficient manner. Additionally, if the timing for multiple reactor sites, and the responsibilities of multiple owners can be clarified, the final decommissioning rule on financial considerations will be much more effective and efficient.

D.3.2.1.1(b)

D.4.5

Sincerely,



R. P. McDonald

RPM/MDR:c1

**DUKE POWER COMPANY**  
P.O. BOX 33189  
CHARLOTTE, N.C. 28242

**HAL B. TUCKER**  
VICE PRESIDENT  
NUCLEAR PRODUCTION

TELEPHONE  
(704) 373-4831

~~CONFIDENTIAL~~ **PR-30, 40, 50, et al**  
**(50 FR 5600)**  
**(102)**

May 13, 1985

DOCKETED  
USNRC

85 MAY 17 P1:02

Mr. Samuel J. Chilk, Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Subject: Duke Power Company  
Comments on 10 CFR Parts 30, 40, 50, 51, 70 and 72 -  
Decommissioning Criteria for Nuclear Facilities  
(Proposed Rule)

Dear Mr. Chilk:

The NRC requested in a Federal Register Notice dated February 11, 1985 (Volume 50, Number 28, FR 5600) comments on the subject proposed rule. In response, Duke Power Company offers the following for consideration.

First and foremost Duke would like to point out that it joins in and supports the comments filed by the law firm of Bishop, Liberman, Cook, Purcell and Reynolds, which were filed on behalf of the Utility Decommissioning Group. The general and specific comments offered below refer to those aspects of the proposed rule which, because of their potentially large impact on the industry, merit special emphasis.

General Comments

The Commission's proposed rule on decommissioning nuclear facilities is comprehensive and reflects considerable effort by the Commission and its staff. Nevertheless, in light of this effort and the Commission's concern, Duke Power Company is of the opinion that the proposed rule and associated requirements are overly restrictive placing unnecessary and costly constraints on the initiatives of the Nuclear Power Industry. Knowing some of the general NRC concerns and feeling that some form of promulgated regulation will eventually evolve from the Proposed Rule, we will focus specific comments on aspects of the rule which require modification.

G.1

D.8.1

Specific Comments

- The conclusion that \$100 million will "provide sufficient funds" to cover the costs to decommission "most" power reactors (50 FED at 5606, Col. 3) substantially understates the cost to decommission a large scale commercial power reactor and is generally not an acceptable figure to the Nuclear Power Industry. Funding amounts and methods of

D.2.1(a)

Mr. Samuel J. Chilk, Secretary  
May 13, 1985  
Page 2

funding should be eliminated from the rule (emphasis added). If, for some reason, this information is considered necessary then it would be preferable to state the funding amount as a minimum funding amount that entitles a licensee to use the certification option and does not and is not intended to reflect actual costs for any power reactor. The rulemaking must give the licensee the option and the flexibility as to the methods of funding (internal as well as external).

D.2.1(a)

D.2.1(b)

D.3.1

Comment Discussion

As indicated in general comments this rule as formed could result in increased costs for the customers of all Utilities with respect to the question of financial assurance. The Nuclear Regulatory Commission, particularly Commissioners Bernthal and Asselstine, clearly favors segregated, external funding of anticipated decommissioning costs. Duke Power Company now uses a mechanism of mingled, internal funding to provide for future decommissioning expenses. The proposed rule does permit the use of the depreciation mechanism or other internal approaches to fund estimated decommissioning costs, but it includes an explicit preference for using external, segregated approaches.

D.3.2.2.5

The Commission seems unable to reconcile itself to dealing with corporations or local governments which, by definition, have limited resources. The Federal Government is the only licensee in this country for which the Commission can know without doubt that funds will be available for all the ultimate costs of decommissioning. All other licensees have limited resources in that they depend directly or indirectly upon taxes or business revenues for all resources, including access to the capital markets.

Furthermore, Commissioner Bernthal voices concern that licensees lack any incentive to "dedicate funds in advance for successful completion of decommissioning." This is a correct observation, as the proposal itself analyzes, in cases which licensees have more productive use of funds than thirty year escrow accounts. It is not an observation, however, that should cause concern. The Commission should screen corporations and local governments for financial integrity before issuing licenses. It then serves the best interests of all parties including the public to permit the licensee to operate in an economical manner to maximize the likelihood that adequate resources will be available for all obligations associated with its nuclear facility.

D.8.1

Decommissioning costs are but one of many obligations of licensees. Isolating this cost and focusing on it to the detriment of the economic prosperity of the licensee does not serve the overall goals of the Commission or the best interests of the public. This would be true even if licensees could precisely project their decommissioning liabilities, which is clearly impossible at this time.

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Duke Power Company now uses a depreciation method to provide for decommissioning costs. The Company may or may not continue using that approach. The problem with the proposed rule is not that it is biased against all such internal funding approaches. The problem is that it is biased at all. Once the Commission has found a corporation credit-worthy enough to receive a license, it should not impede that corporation in its business operations.

D. 8.1

The Commission should permit licensees the greatest flexibility. To whatever extent new regulations reduce the economic strength of licensees, the "improved" financial assurance is illusory. Prudent management of corporate assets, unencumbered by unnecessary regulations, may well offset any additional security stemming from external segregation or insurance policies. The Commission should screen out financially unqualified applicants during licensing proceedings and should not thereafter intercede in the financial management of the licensees. If the Commission feels a licensee is no longer likely to fulfill its financial obligations, it could consider whether that license should be revoked.

D. 3.1

D. 8.1

Insurance (50 Fed. Reg. at 5607, Item 4)

Insurance is a funding method used when costs may be incurred by an unexpected event (fire insurance) or by an expected event at an unknown time (life insurance). Funding for an expected event at a known time is not insurance (normal decommissioning).

Nuclear property insurance funds would be available for premature decommissioning only if an insured event under the policy was responsible for the premature decommissioning and only in the amount that would have been necessary to repair the plant for the damages caused by the accident. Premature decommissioning costs due to regulatory mandate not associated with an accident at the insured plant is not covered.

D. 3.2.2.1

Surety Bonds (50 Fed. Reg. at 5607, Item 4)

Surety bonds for \$100 million are not generally available. Also a surety bond could be cancelled by the surety which would leave the utility without a financial guarantee. Performance Bonds do not provide funding, they simply guarantee performance by an entity. Should the entity default and the surety pay the obligation, the surety then requires reimbursement from the defaulting entity. Surety bonds or insurance are not viable alternatives for normal decommissioning or premature decommissioning not associated with an accident.

The NRC must utilize the provisions of paragraph 50.33(4) in order to maintain the credibility of internal funding.

- Paragraph 50.33(2) requires "total annual operating costs for each of the first five years of operation of the facility." This information is not related to the issue and should not be a part of the rulemaking.

G. 18

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- Duke urges the Commission to revise sections 50.54(cc) and (dd) of the proposed regulation so that regulatory requirements associated with decommissioning are not imposed as license conditions (emphasis added). Making these requirements license conditions does not enhance in any way their enforceability. Instead, it may force the Commission to hold unnecessary trial-type hearings at the behest of intervenors even though there is no safety concern with plant operation. Section 189a of the Atomic Energy Act, 42 U.S.C. §2239, requires a hearing upon request in any proceeding to amend a license or construction permit. If the requirements relating to submission and approval of decommissioning funding plans and record keeping are incorporated into operating licenses, it may, for example, be possible to construe any change to an approved funding plan and any exemption from these requirements as license amendments. That would trigger the notice and hearing procedures of section 189, despite the fact that these requirements have no impact on the safe operation of a power plant. For this reason, the Commission should avoid imposing nonsafety-related requirements as license conditions, and should instead follow the usual practice of incorporating into licenses only those matters relating to reactor operations. These difficulties can be avoided or substantially lessened by simply imposing the decommissioning funding and record keeping requirements by regulation rather than license condition.
- The definition of "Decommissioning" must be clarified. The proposed Statement of Considerations suggests that decommissioning means to remove "nuclear facilities" from service, including "the site, buildings and contents, and equipment associated with any NRC licensed activity," (50 FED REG at 5600, Col. 3.) This statement is much too broad; the removal of all buildings and equipment associated with NRC licensed activities at the site is not within the generally understood scope of decommissioning and contradicts proposed section 30.4(y).
- The decommissioning alternative of ENTOMB should be specific. As proposed the ENTOMB criteria indicates "within a period on the order of 100 years." This criteria arbitrarily imposes unnecessary constraints on the licensee.

We appreciate this opportunity to provide you with our comments. We trust that our comments will be considered and that the Commission will move promptly to resolve this proposed rule.

If there are any questions or problems concerning this subject, please advise.

Very truly yours,



H. B. Tucker

JWD:smh

C.7.2  
D.4.4

B.1.2.1

B.4.3  
B.5

JULY 1985  
PROPOSED RULE PR-30, 40, 50 et al  
(50 FR 5600) (103)

COMMENTS OF THE NUCLEAR INFORMATION AND RESOURCE SERVICE

ON NRC'S PROPOSED RULE: "DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES,"

50 FED. REG. 5600, FEBRUARY 11, 1985.

OFFICE OF  
NRC

Introduction

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OFFICE OF REGULATORY  
DOCKETING & SERVICE

The Nuclear Regulatory Commission has published a proposed rule entitled "Decommissioning Criteria for Nuclear Facilities." 50 Fed. Reg. 5600, February 11, 1985. The proposed rule purports to establish standards by which nuclear facilities can be decommissioned and released for unrestricted use addressing the following five categories: alternatives, timing, planning, financial assurance and residual radioactivity. However, the rule gives little or no guidance regarding how decommissioning methods should be chosen and carried out in order to minimize the risks to decommissioning workers and the general public instead deferring consideration of such issues to the issuance of Regulatory Guides addressing: 1) decommissioning alternatives (revision of Reg. Guide 1.86), 2) factors affecting the timing, 3) additional guidance on providing financial assurance, and 4) guidance for the format and content of decommissioning plans for Part 30, 40 and 70 licensees. Nor can such guidance be found in the Draft Generic Environmental Impact Statement (NUREG-0586) on decommissioning, published in January 1981, which provides only the briefest discussion of decommissioning methods and their impacts. Instead, the rule focuses on establishing minimal reporting requirements and a broad range of funding schemes for licensees.

B.3.1.1

Even these minimal requirements are seriously deficient. Some of the

D.3.2.1.1(a)

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proposed decommissioning funding schemes do not provide reasonable assurance that utilities will have adequate resources to carry out decommissioning. Moreover, the sum that licensees would be required to set aside for decommissioning is unrealistically low, reflecting inadequate consideration of the costs and public health risks of decommissioning. The Commission has also deferred Part 20 amendments to establish acceptable residual radiation levels, thus adding more uncertainty to its estimates regarding the expense and radiation exposure incurred during decommissioning. Finally, the rule does not establish any special requirements for the even more costly and dangerous work of decommissioning plants that have experienced a radiological accident.

D.3.2.1.1(a)

D.1.1.1

C.1.17.1

The Department of Energy estimates 20 commercial power reactors will be ready for decommissioning by the year 2000. Decommissioning activities have already started at a handful of plants (e.g. Dresden-1, Peachbottom-1, Humboldt Bay, Indian Point-1, Fermi-1) that are now being handled on a case by case basis. NIRS urges the Commission to promulgate a comprehensive set of regulations governing the planning, safety and financing of decommissioning with speed. The owners of the nation's operating reactors, particularly those with older plants, should begin collecting funds for decommissioning at a realistic level set by the Commission, at the earliest possible date.

D.8.1  
G.1

D.4.1.1

Clearly, to date, utilities have not gathered funds at a rate proportional to the total sums that will eventually be required. See Table 4, "Dismantling the Myths About Nuclear Decommissioning," Public Citizen/Environmental Action, April 1985 at 16. For example, the 32% owner/operator of the Vermont Yankee plant, which has operated for 13 years, has collected only \$.6 million despite an estimated cost of decommissioning of \$82.9 (\$1983).

D.4.6.1

The proposed rule has three major shortcomings: 1) it permits the use of unreliable funding methods and underestimates the costs of decommissioning; 2) it creates a confusing and inadequate regulatory scheme; and 3) it violates the National Environmental Policy Act. These problems are discussed below.

D.3.2.1.1(a)  
D.1.1.1  
C.1.1  
F.1

I. The Rule Does Not Provide Assurance of Adequate Funding.

A. Costs and Risks of Decommissioning Underestimated.

The proposed rule requires that utilities which do not submit a proposed decommissioning funding plan must set aside at least \$100 million (1984 dollars, adjusted annually for inflation using an inflation rate twice that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor). Proposed 10 C.F.R. 50.33(k)(1). Presumably, the Commission also considers this \$100 million figure to be a benchmark for measuring the adequacy of decommissioning funding plans. Ironically, the nuclear industry's Atomic Industrial Forum believes that the average cost of decommissioning a commercial reactor will range over this \$100 million benchmark, from \$120 to \$170 million (\$1985). Nucleonics Week, April 25, 1985 at 8. Those utilities submitting decommissioning funding plans will not be required to set aside any predetermined minimum amount for decommissioning. Thus, the rule leaves a potentially huge gap in the assurance that adequate funding will be collected. The proposed decommissioning rule, while allowing for the submittal of such plans, does not contain any criteria by which the NRC Staff, the public and even state public utility commissions can judge

D.1.1.1

D.2.1(c)

their adequacy. The rule also does not establish that plans proposing a fund with less than the minimum figure should cover all aspects of decommissioning, including, for example, decontamination procedures and waste transportation, both of which can be substantial. Moreover, the Commission's experience with nuclear plant cleanup and decommissioning, along with the research of its consultants, demonstrates that the rule may seriously underestimate decommissioning costs.

D.2.1(c)

The NRC bases its cost estimates for the decommissioning of commercial power reactors on NRC-funded studies done by Battelle's Pacific Northwest Laboratory. "Technology, Safety, and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station," NUREG/CR-0130, June 1978 and "Technology, Safety, and Costs of Decommissioning a Reference Boiling Water Reactor Power Station," NUREG/CR-0672, June 1980. These studies were based on data gathered in 1978 using "reference" power reactors that had operated 6 years or less. The cost analyses performed by Battelle are deficient in many ways. As Battelle itself points out, without regulations setting the residual radiation levels, it is difficult to calculate the costs of decontaminating materials. NUREG/CR-0130 at 2-15 and 9-5. Estimates of occupational radiation exposure, and thus costs, are sensitive to management philosophy and the decommissioning methods utilized and thus vary significantly from plant to plant. However, NRC calculated the \$100 million figure in the proposed rule by adjusting the Battelle figures for inflation only. It is clear that more than inflation will increase the cost of decommissioning.

D.1.1.1

In October 1983, NRC research showed that operating and maintenance

practices could lead to big cost differences in decommissioning. Inside NRC, October 31, 1983 at 6. For example, a licensee's failure to maintain a good seal on porous concrete surfaces will result in more contaminated concrete. Id. This, in turn, will result in larger volumes of waste and hence higher disposal costs, a factor already identified by Battelle and others to be a primary component of decommissioning costs. Ironically, the areas of operating and maintenance are usually the first to suffer cutbacks by utilities with financial difficulties. Additionally, NRC consultants have pointed out that during decommissioning operations the entire plant comes under scrutiny and must be considered for decontamination. "Decontamination Processes for Restorative Operations and as a Precursor to Decommissioning: A Literature Review," May 1981, NUREG/CR-1915 at 10. The secondary system, which uses different water chemistry and therefore has different corrosion products, may become contaminated due to leaks in the steam generators. Despite storage systems designed to contain radioactivity, leaks due to deterioration of components and operational error can be expected. Permeable materials like concrete will be contaminated internally as can soils. Decontamination of such materials requires removal of surfaces to the depth of contamination, which may be significant particularly if the concrete is uncoated and the contaminant is in liquid form. NUREG/CR-1915 at 10-14. Housekeeping or operating philosophy has been identified as critical for the expected radiation fields and plant exposure rates. NUREG/CR-0130 at 7-36 and NUREG/CR-1915 at 11.

D.1.1.1

Moreover, some data simply does not exist. For example, there is no information on the depth of potential contamination of concrete over a 30-40

year operating history. Battelle states that measurements of activated stainless steel irradiated over 10 years are needed for the purpose of determining the growth of long-lived radionuclides such as Ni-59 and Nb-94. NUREG-0130 at 2-15. Similarly, measurements of the growth of radionuclides in the biological shield for levels of Europium-152 and Europium-154 are needed. In addition, studies to determine the actual levels of radioactivity on the soil surfaces nearby an operating reactor would help to characterize the residual radioactivity that can be expected after a 40 years of operation. NUREG/CR-0130 at 2-15. Battelle's study on PWRs concludes that: "... the data presently available are not adequate to permit extrapolation to thirty years of full power operation, as shown in Figure 7.4-2... A wide range of dose rates seen in the table (from 0.001 to 30r/hr) are postulated to be typical for the reference PWR after final shutdown and before any chemical decontamination efforts." NUREG/CR-0130 at 2-15. It is important to note that figure 7.4-2 only is carried out to 16 Effective Full Power Years (EFPY) of operation. Indicative of the many potential unknowns is the experience of dismantling the Elk River reactor which only operated at 2.5 EFPY. There, levels of Na-22 and Eu-152 were measured -- isotopes that hadn't even been expected to occur in the reference PWR. Table 7.3-5 NUREG/CR-0130.

D.1.1.1

A more recent study done by two Bechtel Power researchers, reported in the July 19, 1984 issue of Public Utilities Fortnightly, states, "[T]he current practice of adjusting an estimate for escalation (effects of inflation) on a periodic basis, without a concomitant examination of cost components relative to today's technical base, plant operating history, and regulations could result in an understatement of current costs." An Analysis

D.4.3

of Decommissioning Cost Estimated for Nuclear Operating Plants, Richard R. Buta and Robert E. Palmer, at 47-49. The authors concluded: "our study strongly suggests that decommissioning estimates made in earlier years -- and updated only for inflation -- result in an understatement of current costs regardless of the decommissioning method." This is particularly relevant considering the current lack of regulatory requirements governing operating and design features that would facilitate decommissioning. Discussed below, such features have been suggested by federal contractors such as Rockwell International (in conjunction with the dismantlement of the Sodium Reactor Experiment) and Battelle. See Section II.B.4.

D.4.3

The Battelle studies were based in part on the country's limited experience with decommissioning and dismantlement. While a total of five licensed power reactors, four demonstration reactors, six licensed test reactors, 28 research reactors, and 22 critical test facilities have been decommissioned, Battelle concluded: "Because of differences in reactor size, type and design, operating time, licensing requirements, location, motive for installation of the facility, and conditions of concern (e.g. costs, shutdown radiation levels, amounts of radioactive waste) extrapolations from these experiences to large commercial reactors are considered to be generally unreasonable." NUREG 0310 at 3-1. This decommissioning experience itself, however, shows that the cost of decommissioning a large reactor with a long operating life will in fact be much higher than \$100 million (\$1985). The Dresden-1 plant, for example, is relatively small (207MWe) and with a relatively short operating life (19 years). Yet, the decontamination phase of its decommissioning alone cost \$40 million, not including the cost of waste

D.1.1.1

treatment, shipment and disposal, which according to NRC's own research is the major component of decontamination costs. Inside NRC, October 31, 1983 at 6. The decontamination structure built at Dresden-1 was intended for operational decontamination for all three units, however, the experience still illustrates a point: Battelle estimated that decontamination of a PWR would cost (exclusive of waste disposal and transportation) \$288,393 to \$414,713 (\$1984), approximately 96 times lower than one third of the cost of the Dresden decontamination. Decontamination of a plant four or five times the size of Dresden-1 that had operated twice as long would cost much more. And this would not account for the other costs of decommissioning, such as dismantling the plant and shipping the wastes. Even the decommissioning of the much smaller (72 MWe) Department of Energy Shippingport reactor is now expected to cost \$79 million. This estimate may be particularly low because the reactor vessel will be shipped intact and disposed of in a (tax-subsidized) military waste dump (Hanford), two things that utilities with larger reactors will be unable to accomplish. Even after as much as a 100-year delay, the internal components of a reactor would still have to be sectioned underwater. NUREG/CR-8138 at 9-51. This is also true of the reactor vessel and parts of the bioshield for under 50 years of storage and possibly piping which would at least have to be measured for Co-60 levels. Id.

D.1.1.1

Moreover, this estimation is not necessarily realistic, when viewed in comparison with current cost estimates for decommissioning the smaller Humboldt Bay reactor. Pacific Gas & Electric Co. estimates that decommissioning the 65 MWe Humboldt reactor will cost \$688 million (\$2015). Testimony of Junona Klein, Pacific Gas & Electric Co., Before the California

Public Utilities Commission, April 23, 1984, Transcript at 536. This cannot be reconciled with Portland General Electric's estimate that decommissioning of the much larger (1130 MWe) Trojan Nuclear Power Plant will cost only \$173 million (\$2011) in the year 2011. These grossly disparate and disproportionate cost estimates demonstrate that decommissioning costs may vary widely from plant to plant, and perhaps more importantly, that estimates may vary widely based on differing and inconsistent assumptions made by licensees. They also strongly suggest that decommissioning of large reactors is likely to cost much more than \$100 million (\$1985). The Commission should review current material on decommissioning costs and incorporate a higher, more realistic estimate of decommissioning costs in the rule.

D.1.1.1

D.2.1(b)

The cost estimate for decommissioning also should be more conservative because acceptable dose rate levels for decommissioning workers may decrease in the future. The cost of decommissioning is likely to increase as allowable worker exposure levels are decreased, a General Accounting Office report concluded. Report to Congress by the Comptroller General of the U.S., "Cleaning Up the Remains of Nuclear Facilities -- A Multibillion Dollar Problem," June 1977. It is likely that such dose rates will be decreased by the time most reactors undergo decommissioning, as new information on the health and genetic risks of low radiation doses become more clear. Many scientists have already called for a ten-fold reduction in existing allowable worker exposures. For example, Dr. Edward Radford recommends that for workers, the standard for maximum exposures should be cut from 5 rem (average annual dose) to 0.5 rem. Such a reduction in exposure levels would require a utility to hire more workers thus increasing the labor cost of

D.1.1.1

decommissioning.

A gross failure of the proposed rule is that it does not assure accurate cost estimates when they are needed most: during the time the utility is collecting the funds. The proposal requires a licensee to submit decommissioning cost estimates twice: first, upon application for an operating license (or for license holders, two years following promulgation of the rule); and second, about five years before the projected end of operation. Thus, a licensee may very well go for twenty-five years without updating decommissioning costs estimates. In that time, industry-wide experience or events at the plant may show that the original estimate was far too low. In their study of decommissioning cost estimates the two Bechtel Power researchers reported "the average cost and range of estimated costs for studies completed between 1979 and 1983 have significantly exceeded similar costs for those studies published during 1975 to 1978 and adjusted to 1983 dollars only for inflation." According to their figures, the cost of decommissioning rose from an average of \$91 million (\$1983) to an average of \$123 million (\$1983). A 1979 Rand Corporation study which looked at cost escalation for "first of a kind" technologies showed that large, unanticipated cost overruns averaged around 400% for construction projects completed between 1956 and 1977. "Dismantling the Myths About Nuclear Decommissioning," at 27. Another official Christopher Meyers has concluded: "One of the key factors leading to potential errors in cost estimation for decommissioning might be the length of time the estimation is made [before] the time work is actually to be completed." Id. at 20. Thus, it can be assumed that initial estimations of decommissioning costs will be low, perhaps extremely low. It

D.4.3

D.1.1.1

is very poor planning to wait until the eve of decommissioning to require a licensee to reassess those costs and to quickly make up the difference in its decommissioning fund. Furthermore, the timing of collection of revenues is significant: the earlier funds are collected from customers the more the total decommissioning expense is covered by interest payments rather than ratepayers. The rule should require reassessment of costs and readjustment of the decommissioning fund at five-year intervals throughout the operating life of a plant.

D.4.3

B. Unreliable Decommissioning Funding Methods Permitted.

The proposed rule requires utilities to set aside a decommissioning fund of at least \$100 million, unless the utility provides NRC with a "decommissioning funding plan." The proposal allows utilities to choose from among several financing schemes, including prepayment, external sinking fund, a surety method or insurance, and an internal reserve. Prepayment constitutes a pre-operational deposit of an amount of money which, with earned interest, would accrue to the necessary amount by the time of decommissioning. It may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. An external sinking fund would also consist of a separate, independent account, with payments to be made over time rather than all at once. Under the third option, the licensee would obtain a guarantee of decommissioning funds in the form of a surety bond, letter of credit, line of credit, secured interest, or other guarantee method. Finally, the rule permits establishment of an internal reserve account, not segregated from the licensee's assets and within the licensee's control.

D.3.2.1.1(a)

These funds could be invested in the licensee's assets and then theoretically be reclaimed by issuance of bonds at the time of decommissioning. Under the rule, in order to use this option, an electric utility must own more than one generating facility.

The last option, establishment of an internal reserve, should be removed from the proposed rule because it provides little assurance that decommissioning funds will be available when a plant is ready for decommissioning. As widely recognized, financial assurance is a concern in part because of questions regarding the long-term future financial health of the electric industry as a whole. In testimony on behalf of the Missouri Public Service Commission Staff in August 1984, Dr. Carolyn Smith, Senior Consultant with J.W. Wilson and Associates Inc., pointed out that "At the time that decommissioning occurs, the cash needed to pay for decommissioning must be obtained from investors. For this reason, the net negative salvage approach performs poorly with respect to the financial assurance criterion....Adoption of the net negative salvage approach could cause serious cash flow problems for Union Electric at the time decommissioning occurs, especially under an immediate dismantlement plan." Furthermore, the Commission may set the stage for another financial crisis in the utility industry if it fails to require the collection of adequate funds over time. Numerous reactors will be decommissioned at approximately the same time and as these reactors are shut down, utilities will be attempting to replace them with new capacity. Id. at 24. Contrary to the Commission's conclusion that "The internal reserve method tends to be less expensive..." the financial assurance provided by external funding method is a valuable commodity -- one

D.3.2.1.1(a)

D.3.2.1.2

that is regularly bought and sold in our economy. Surrebuttal Testimony of Dr. Carolyn Smith, November 1984, Before the Missouri Public Service Commission.

D.3.2.1.2

The assets that are expected to fund decommissioning may lose value or be claimed by creditors before a plant is decommissioned. For instance, the assets of the WPPSS (Washington Public Power Supply System) and Three Mile Island plants, or any other cancelled or shutdown plants, now have little value for purposes of raising decommissioning funds for other nuclear plants owned by those utilities. Financial insolvency or bankruptcy would also place unsegregated decommissioning funds at serious risk. Financial problems could, for example, drive a utility to sell its assets at a loss, thus jeopardizing decommissioning funds. In the event of a bankruptcy, the fate of decommissioning funds is unclear. No nuclear licensee has declared bankruptcy as yet, but several have been on the verge. We are aware of no federal law that would place assets designated as collateral for decommissioning costs beyond the reach of creditors in a bankruptcy proceeding.

D.3.2.1.1(a)

The Commission has attempted to bolster the reliability of internal reserves in three respects. First, it would require that a utility own more than one generating facility in order to avail itself of the internal reserve option. However, that approach provides no extra certainty that funds will be available because it does not require that the investment be made in facilities other than nuclear power plants. As such, it constitutes robbing Peter to pay Paul. Whether a utility owns one nuclear plant or five, it will have to decommission each of those plants. Thus, the pledging of one plant's

assets to decommission another simply shifts the obligation between the same pool of debtors without adding any security. The Commission states in the discussion preceding the actual rule that a utility that uses an internal reserve must have backup insurance. 58 Fed. Reg. at 5688. This requirement does not appear in the text of the proposed rule, however. Its enforceability is thus unclear. Moreover, the NRC states that for most electric utilities, the post-accident insurance required by NRC regulations will be sufficient to meet the requirement. It is difficult to see how this insurance, which covers "onsite property damage," (18 C.F.R. 58.54(w)), could be used to cover the costs of ordinary plant decommissioning. Dr. David M. Rosenbaum of Technical Analysis Corporation, a consultant for the Missouri Public Service Commission Staff, recently concluded, "No [accident] insurance sold by any principle source would pay the costs associated with non-accidental premature shutdown and decommissioning of a nuclear project." Direct Testimony, August 29, 1984, WER-84-168. Even where decommissioning followed an accident, it is unclear how much of the insurance would actually offset the cost of decommissioning, if at all.

D.3.2.1.1(a)

D.3.2.2.1

The Commission states in its preamble that a utility contemplating use of the SAFSTOR option must use external funds, thus prohibiting use of internal funding mechanisms while the plant lies dormant for extended periods. This limitation on the use of the less reliable internal funding mechanisms will have no real effect. Licensees who wish to take advantage of the internal reserve mechanism as a source of capital can simply state at the outset that they intend to decommission immediately, whether or not they actually intend to choose that option.

D.3.2.1.2

Finally, both the internal reserve and the external sinking fund suffer from the weakness that they assume that a licensee will be able to continue making deposits over the life of the plant. If a plant shuts down prematurely and stops generating revenues, the licensee may be unable to make those deposits. As the technical problems associated with aging materials and corrosion (e.g. Intergranular Stress Corrosion Cracking, Pressurized Thermal Shock, Steam Generator tube degradation) increase with a reactor's age, and new safety information becomes available on certain plants (such as the seismic siting issues for Humboldt Bay and San Onofre-1) it is increasingly likely that utilities will find it financially advisable to prematurely shut down plants permanently. Any funding scheme that relies on deposits made over time should thus be required to be backed by insurance for premature shutdown.

D.3.2.2.1

11. Decommissioning Regulations Are Unclear and Inadequate.

The Commission states in the discussion that it considered creating a separate set of regulations for decommissioning, but opted instead for amendments to its existing regulations. Thus, for the decommissioning of nuclear power plants, the Commission proposes changes to 10 C.F.R. Parts 50 and 70. This approach, while simple, both creates great confusion about the actual state of a license pending and during decommissioning, and fails to supply sufficient guidance to licensees for decommissioning, and to the NRC Staff which is responsible for reviews. Ironically, in a recent notice of proposed rulemaking, regarding "Licenses and Radiation Safety Requirements for Well-Logging Operations," the Commission grappled with the same issue and decided to do just the reverse: i.e. to create a new set of regulations, in order to "provide comprehensive and consistent regulations," and because "current regulations do not provide specific requirements." The proposed rule on well-logging goes on to say:

A new part is needed because these operations use byproduct material, source material, and special nuclear material. If these safety requirements were not included in one part, they would have been repeated in Parts 30 (byproduct material), 40 (source material) and 70 (special nuclear material). X X X Furthermore, if the safety requirements were fragmented throughout Parts 30, 40, and 70, licensees, NRC licensing reviewers, and NRC inspectors could have difficulty in determining the regulations applicable to a specific situation.

50 Fed. Reg. 13798. This is the very result of NRC's proposed decommissioning rules which will amend a few regulations in lieu of providing a whole new part. As a result, NRC proposed rules on decommissioning are unclear and inconsistent and there are no comprehensive safety requirements.

C.1.3.1

C.1.1

A. The Licensing Scheme Governing Decommissioning Is Ill-Defined.

It is not clear from the proposed rule what, if any, license will govern the decommissioning (including any "safe storage" period) of a nuclear power plant. For example, the proposed amendments to Part 50 contain several conflicting provisions. Proposed section 50.51 provides that unless application for renewal of a license is made, a licensee must apply to terminate the license no later than one year prior to the license's expiration date. This appears to suggest that renewal of a (Part 50) operating license is for the purpose of operating a plant, and that decommissioning occurs upon the granting of the request to terminate the license. This provision also seems to contain the assumption that the license will expire unless it is renewed. This is a logical scheme for operating licenses. On the other hand, proposed Section 50.82, "Applications for terminations of licenses," allows the Commission to terminate the license when it finds that the plant has been decommissioned properly. The period in between this (50.82) application for termination filed by the utility and an actual Commission decision to terminate, appears to be governed by a Commission "order" (proposed 10 C.F.R. 50.82(e)) which authorizes decommissioning upon approval of the decommissioning plan. It is thus unclear from the rule whether decommissioning is actually governed by a Part 50 license.

C.1.1

The proposed amendments to Part 70, which regulates possession of nuclear material, are slightly more clear. After a Part 70 license expires, the license continues in effect until the plant is decommissioned. 10 C.F.R.

70.38(e). However, the Commission leaves unclear whether the Part 70 license (which in most cases is incorporated into a Part 50 full power operating license) is renewed or reissued in order to permit decommissioning. It is also unclear whether the Part 70 license exclusively governs decommissioning, or whether it is merely included in an some sort of modified "possession-only" Part 50 operating license.

Clarification of these points is extremely important to guarantee meaningful public participation in any decommissioning decision. The granting of authority to decommission a plant involves either a license amendment or the issuance of a new license. Either of those actions triggers hearing rights under the Atomic Energy Act. The public is entitled to notice of the nature of the license or amendments, and what regulations and statutory provisions the licensee must comply with in order to obtain the requested approval. Otherwise prospective intervenors and interested states have no means of evaluating whether the licensing action complies with applicable law. In this case, the NRC has left unclear what type of a licensing action is constituted by decommissioning approval and what regulations will govern both its approval of decommissioning plans and actual decommissioning activities.

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NIRS concludes that the Commission should have established a new regulatory section governing decommissioning of nuclear power plants. Whether the Commission chose to amend licenses to allow "decommissioning only" or to issue new decommissioning licenses, these regulations would exclusively govern decommissioning. Not only would such a step clarify the nature of the Commission's licensing action, but it would force the NRC to define what

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regulations apply to decommissioning. As it stands now, a plant being decommissioned under Part 50 is subject to a host of regulations that may or may not be applicable to decommissioning in a practical sense, as many relate to plant operation. More importantly, neither Part 50 nor Part 70 contain specific guidance for decommissioning. Furthermore, as recommended in NUREG/CR-0130, the NRC should prepare an index of the existing regulations applicable to decommissioning. These regulations should be incorporated by reference into a separate set of rules that specifically govern decommissioning.

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B. Separate Decommissioning Standards Are Needed.

The rule should provide specific guidance for decommissioning at the three stages of decommissioning: at the planning stage when a utility weighs the costs and benefits of choosing a particular alternative; during any period of "safe storage" that is allowed by NRC; and during the actual decommissioning operations. These regulations need not address decommissioning in exhaustive detail. Like the NRC's existing regulations for nuclear power plant operation, they should provide a framework of safety goals which then can be met through a variety of means, some of which will be suggested in associated, nonbinding, Regulatory Guides. Decommissioning regulations would include, for example, definitions of terms, license application requirements, and qualifications for subcontractors.

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1. Criteria for Decommissioning Choices.

The proposed rule gives licensees a choice of three alternative methods of decommissioning: "DECON," or immediate decontamination, dismantlement and removal of nuclear facilities; "SAFSTOR," a method reducing occupational exposures by immediate chemical decontamination with dismantlement postponed to allow for radioactive decay; and "ENTOMB," or permanent encasement of the facility. In the rule's preface, the Commission rejects ENTOMB as a viable method for decommissioning nuclear power plants, but the proposed rule does not specifically state this. It should clearly reject ENTOMB as an option for nuclear power plants.

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The rule contains only vague and limited criteria that provide an inadequate basis for judging the relative merits of a utility's choice of decommissioning methods. The rule requires that licensees choose a decommissioning method, and states that "Alternative methods for decommissioning which significantly delay completion of decommissioning such as use of a storage period, will be acceptable if sufficient benefit results." Proposed 18 C.F.R. 50.82(b)(1). The Commission does not explain what a "significant" delay is, or what the Commission considers "sufficient benefit" to consist of. This language leaves the licensee with almost entirely unreviewable discretion to make decommissioning choices that could have significant impacts on public health and safety. The rule gives little information that would allow the NRC or anyone else to evaluate the wisdom of a particular decommissioning timing choice.

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In the first place, the Commission does not even give a full description of the decommissioning alternatives. Only the briefest description of DECON,

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SAFESTOR, and ENTOMB, is given. Nor can any detail comparing the costs and benefits of the alternatives be found in the Draft Generic Environmental Impact Statement ("DGEIS," NUREG-8586) that is cited in support of the rule. The rule does not give a fair picture of the complexities involved with either method. For example, according to documents cited by NRC in support of the rule, current decommissioning technology relies heavily on the use of chemicals to decontaminate a plant before it is dismantled. Although these chemicals can significantly reduce radiation exposure of decommissioning workers, the chelated wastes produced in the decontamination process are extremely potent and potentially dangerous to decommissioning workers. Neither the rule nor the DGEIS discusses the potential health and environmental impacts of this aspect of decommissioning. Nor do they attempt to address the costs and benefits of chemical decontamination.

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Moreover, the rule only hints at the difficulty in balancing the costs and benefits of immediate decommissioning versus storage pending further radioactive decay. The preamble mentions that SAFSTOR will result in reduced radiation exposure of decommissioning workers, and that it may be advantageous where disposal space is unavailable. It does not discuss, however, other important considerations that should be factored into a choice between DECON and SAFSTOR. For instance, an important factor to consider would be the age of the plant and the corresponding amount of radioactivity that had built up. Decommissioning smaller reactors, or reactors that have not operated for very long, will undoubtedly involve a smaller degree of worker exposure than decommissioning larger or more long-lived reactors. It is generally agreed that there are considerations for each plant that make choosing an alternative

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plant-specific; however, these differences need not prevent the NRC from setting criteria by which a utility's decision can be governed and reviewed.

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The rule also fails to discuss the availability of offsite storage or disposal space for spent reactor fuel, other high-level waste, or even intermediate or low-level wastes. Prolonged storage or entombment might be a utility's only choices if no offsite storage space is available for any of these wastes. The rule should discuss whether the unavailability of offsite storage space can be the overriding consideration in choosing between decommissioning options. The rule should also provide criteria for the engineering and security measures necessary to protect spent fuel should it remain on-site after reactor shutdown.

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The choice of decommissioning alternatives is too important to leave to the complete discretion of licensees as the rule proposes. The Commission should establish specific criteria for the choice of a decommissioning method that provides the maximum possible assurance that the health and safety of public and workers will be protected. These criteria should include at least the following considerations: occupational radiation exposures, generation and disposal of wastes, assurance that decommissioning will take place, radiation doses to the public, and the quality of decommissioning operations.

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## 2. Standards for Storage Period.

NRC's proposed rule contains no standards governing the long term storage period inherent in the SAFSTOR decommissioning option. First, the rule should provide criteria by which the appropriate length of time can be determined,

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balancing the site-specific costs and benefits. Such considerations might include the design and size of the plant, the financial health of the utility (i.e. prospects that it will be solvent at the time of decommissioning), and the condition of the plant (i.e. costs and occupational exposure associated with preparing the plant for SAFSTOR may be higher where a plant is contaminated) -- all of which affect the potential occupational exposures and the volume of waste likely to be produced. Second, the rule should provide regulations for preparation of the facility for safe storage and ongoing maintenance:

- o the need for and standards governing warning markers both inside and outside the plant;
- o equipment tagging requirements to ensure the best possible information is available when dismantlement is initiated;
- o security measures, including physical barriers and personnel requirements;
- o requirements for the scope and frequency of inspections;
- o radiation monitoring rules; and
- o contingency plans in the event that radiation containment systems fail.

Third, the rule should provide an upper limit to the length of time allowed for mothballing a reactor. The upper limit generally considered is fifty years, although most of the significant beneficial changes have already occurred at a plant after thirty years. The rule should balance any possible incremental benefits against the ever decreasing assurance that adequate funding will be available as time elapses. Furthermore, the rule should set an upper limit for completing the SAFSTOR option.

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3. Standards for Conducting Decommissioning.

The proposed rule offers no substantive regulations for the conduct of decommissioning. Moreover, it is unclear whether the Commission intends to establish substantive standards at a later date. In its present form, this rule is inadequate to serve as guidance for decommissioning nuclear power plants. A complete decommissioning rule must also address, at a minimum, the following issues:

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a. More Protection for Workers Needed.

The effects of occupational exposures constitute the primary health costs involved in choosing the timing and method of decommissioning, yet NRC's rule does not provide any incentive to limit doses nor direction to do so. And, although the choice between immediate and postponed decommissioning substantially affects the degree of occupational radiation exposure, the Commission provides little guidance for making that choice. Moreover, the Commission minimizes the radiation risks of decommissioning in general, and fails to prescribe specific steps for limiting occupational exposures.

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Each licensee is considered to be governed by the "As Low As Reasonably Achievable" (ALARA) standard (10 C.F.R. Part 20), to limit the total cumulative exposures to workers and is required to meet the restrictions regarding individual exposures. NRC relies on the Battelle studies to show that the total doses to workers will be relatively insignificant. However, the NRC's complete lack of experience with decommissioning large aged reactors, combined with the TMI-2 cleanup experience (where, although lower than doses from operation, workers have already been exposed to six times the

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expected amounts), suggest that these studies grossly underestimate the doses that will be incurred. Calculating the health effects from these doses leads to even more differences of opinion.

It is difficult to address the issue of occupational exposures in the context of the proposed rule due to the current critical state of human health studies, particularly the reassessment of data from Hiroshima and Nagasaki, and the possibility that NRC may revise the current Part 20 regulations relating to occupational doses. Current proposals by the International Commission on Radiological Protection (ICRP) would allow for very large increases in the current limits on internal radiation doses to certain organs. Twenty-three of 49 levels for internal doses from specific radionuclides would increase, some as much as 17-fold, if these recommendations are accepted by NRC. On the other hand, many scientists have been recommending for years that the allowable 5 rem average annual external dose for workers be reduced by a factor of ten. The DGEIS does not adequately address health and genetic effects and fails entirely to consider the developing nature of information in this field. Without this analysis, neither NRC nor the licensees can properly assess the costs and benefits attributable to the alternative timing plans. NRC should assume conservative health effect projections rather than the most benign.

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The Commission should devote substantial attention to the development of standards to minimize worker exposure during decommissioning, including specific radiation monitoring requirements. Battelle and others have pointed out that decommissioning can best be carried out immediately following

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shutdown because of the level of knowledge of existing plant workers. NRC should propose more specific standards for records to ensure that when decommissioning is done following a SAFSTOR period that much of this type of information continues to be available. NUREG/CR-0130 at 4-6. The Commission should also consider a number of other suggestions that have been made for decreasing occupational doses, aside from the safety rules discussed below. One would require the registry of workers who participate in decommissioning activities, for the dual purpose of properly assessing the health and genetic impacts of their cumulative exposures, and for compensation purposes arising from wrongful death suits in the future. Another would require representatives of workers to be involved in the creation of the decommissioning plans and procedures.

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b. Quality Assurance/Quality Control Needed Throughout the Planning and Implementation of Decommissioning.

As stated above, it is unclear if current Part 50 regulations, which govern all the safety aspects of nuclear plant operation, remain in effect during decommissioning. One aspect of the Part 50 regulations is quality assurance/quality control, which should play an important role in decommissioning activities. The proposed rule should implement regulations that provide for QA/QC throughout the planning and carrying out of decommissioning activities. These rules should require, among other things, that there be a QA/QC staff that is independent from the engineering and radiation monitoring departments. Prior to actual decommissioning operations, for example, QA/QC should:

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- o review the decommissioning plans and assure adequate QA involvement in the decommissioning activities;
- o prepare inspection and test procedures for work plans;
- o review designs of test and other equipment;
- o inspect equipment used for QA functions;
- o verify the quality control of suppliers of shipping containers, monitoring and test equipment, and other equipment and materials;
- o prepare test and inspection procedures for subcontractors; prepare test, inspection and QA procedures for waste packaging and transport; and
- o finalize the plan's QA program.

The rule should also address the QA/QC required during decommissioning operations:

- o the need to provide QA over procurement operations; auditing of suppliers and other program activities;
- o monitoring the performance of specialists and contractors;
- o verifying compliance with rules on packaging and shipping of wastes;
- o performing routine inspections; and
- o maintaining documentation.

QA should assure that the health physics department is involved in nearly every aspect of the decommissioning operations, and QA itself should be involved in radiological status evaluation using an independent health physics team. In sum, quality assurance regulations, such as those in Part 50 Appendix B for operating plants, should be provided for decommissioning.

c. The Rule Should Include Basic Safety Criteria for Decommissioning.

Just as Part 50 Appendix A provides "General Design Criteria" for the safe operation of nuclear plants, the proposed rule should establish certain

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safety criteria for decommissioning. These GDC should, in turn, be interpreted by standards incorporated in the regulations and elaborated upon in Regulatory Guides. Many of these safety goals have been identified in the literature and, in fact, have often been incorporated into the assumptions made by NRC's contractors about radiation doses, cost estimates etc. The establishment of such criteria and regulations would require, for example that:

- o a licensee have expert contractors involved with or responsible for the development of sequencing and procedures for blasting, as well as for the blasting itself, should explosives be used in the decommissioning effort;
- o scheduling and decontamination and cleaning methods be chosen to minimize the scatter of debris and occupational exposures;
- o packaging and shipment be conducted to minimize occupational exposures and reduce cross contamination of clean areas;
- o structures and barriers be used to prevent the spread of radiation and for shielding workers;
- o sample analysis be prompt to protect workers from unnecessary exposures;
- o workers be trained in mildly radioactive areas before working in highly radioactive areas in order to reduce individuals' exposures;
- o active service lines should be protected from disruption during operations;
- o new security and radiation monitoring systems be installed;
- o certain safety equipment be deactivated, others disabled and safety audits conducted of deactivated and operational equipment;
- o tagging of equipment be performed;
- o revised fire protection detection and suppression equipment and procedures be put in place;
- o tamper-proof barriers be installed; and
- o sealants, filtration and venting devices be used.

Additionally, a plant put into safe storage should meet certain security, inspection and reporting requirements.

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A licensee's application to decommission should be required to include discussion of and commitments to meet:

- o certain labelling, security and transportation precautions;
- o design and performance criteria for procedures and equipment, especially experimental equipment and waste handling; operating and emergency procedures;
- o and radiation monitoring, assessment and contamination control.

A licensee's plan for decontamination, both in methods and scheduling, should properly be assessed by the following criteria: effectiveness, efficiency, safety, production of waste, personnel exposure, potential recontamination of previously cleaned surfaces, storage of contaminated materials, and potential for offsite release. For example, the use of some decontamination chemicals requires manual scrubbing causing exposure of workers to both radiation and chemicals. These chemicals include oxalic acid, other caustic acids, and carcinogens. Many of these chemicals are strong oxidants and therefore pose a fire hazard, thus requiring operator training. NUREG/CR-1915 at 22 - 29. These are but a few of the kinds of safety criteria that should be incorporated into the proposed rule. NRC proposes to address specific safety issues in Regulatory Guides. However, a Regulatory Guide merely suggests ways to meet a regulation, and are not binding for a licensee. If this rule is implemented as it now stands, a licensee could conduct its decommissioning activities with virtually complete independence.

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d. The Rule Should Address Questions Regarding Wastes.

There are several areas in which NRC should provide regulations to ensure

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that the production and disposal of radioactive wastes resulting from decommissioning is carried out in the least hazardous manner. The first concerns the production and disposal of so-called "intermediate level wastes." These wastes (which include some concrete and reactor internals) are not currently classified or designated for any particular disposal method. They are not classified as high-level despite the fact that they include long-lived radioactive isotopes such as Nickel-59, Carbon-14, and Niobium-94. Yet, under current rules, these wastes could be disposed of in a low-level waste dump (shallow land burial). To ensure safe disposal, NRC must implement regulations that classify and designate appropriate disposal methods for all of the wastes produced from decommissioning.

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Second, the rule should provide guidance for the special problems associated with the proper disposal of chemical wastes generated during decommissioning. The proposed rule contemplates the use of decontaminants prior to immediate dismantlement, or for storage, despite the relatively little experience with decontamination for decommissioning rather than continued operation. NUREG/CR-1915 at 15. These chemicals are likely to contain chelating agents (EDTA and its homologues, NTA and DPTA) which complex with the radioactive materials present in the reactor systems. The very quality of these agents that makes them effective for chemically cleaning contaminated systems also makes the radionuclides soluble. Thus, chelated wastes containing radioactive material can migrate quickly when placed in disposal. NRC's proposed rules should require physical barriers which would prevent any chelated wastes from reaching other nuclear or chemical wastes present in burial grounds. The rule should also require a licensee to make

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public the chemical formulae used in the decontaminants (many are considered proprietary and are therefore exempt from public scrutiny) and demonstrate adequate levels of testing and scientific review to assure that the chelated agents can and will be stabilized or deactivated for transport and burial purposes.

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Third, because of the limited disposal space available for the vast quantities of waste liable to be produced in decommissioning activities, the rule should require licensees to minimize the amount of waste produced, holding them to an "As Low as Reasonably Achievable" standard. Licensees should also be required to show that the wastes they produce will be accepted by appropriate waste dumps. Waste packages should be required to meet material integrity requirements to prevent them from falling apart due to corrosion, improper packing, effects of chemicals such as chelating agents, and exposure to the elements. Finally, decommissioning plans should show how the decommissioning activities will be affected should there be a delay, short or long, in the shipping of decommissioning wastes.

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e. The Rule Should Apply to All Reactors.

The proposed rule, as written, would exclude a handful of plants that will have been permanently shutdown at the time the rule goes into effect from certain of its provisions. Currently, the rule would require licensees to submit applications for decommissioning at least one year prior to expiration of their operating license. For those plants which have permanently ceased to operate prior to the expiration, an application must be submitted no later

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than 2 years following shutdown. However, NRC has included a blanket exclusion from these timing requirements for all plants having permanently ceased operation prior to finalization of the rule. Other provisions of the rule, i.e. the reporting requirements and funding plans, would apply in a "modified," although unspecified, fashion, as the rule is currently written. There is no rational reason for eliminating these plants from the requirements of the decommissioning rule, except where NRC has already taken significant actions. An appropriate method to prevent unnecessary and unfair hardship to those utilities having already had NRC's informal orders imposed upon them would be to apply for an exemption. An exemption clause in the regulations, rather than the current blanket exception for reactors already shutdown, would ensure the consistent application of NRC's safety regulations.

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4. Operating Procedures and Design Features Could Facilitate Decommissioning.

NRC recommends in the discussion preceding the rule that operating procedures and design features that could facilitate decommissioning be incorporated by utilities, but, except for establishing reporting requirements, declines to institute regulations requiring such measures. While such design requirements would have no application to currently operating plants, they could substantially reduce the decommissioning costs and hazards for new plants. NRC consultants, and others who have conducted dismantlement operations, have recommended a number of beneficial measures. For example, one of the Battelle studies, (NUREG/CR-0130 Vol. 1) points out that NRC's regulations include a design objective for fuel reprocessing plants

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that decontamination and removal of wastes be facilitated by design; yet such a requirement does not extend to power reactors. Additionally, Regulatory Guide 8.8, regarding occupational ALARA, recommends that design concepts anticipate decontamination and decommissioning. Some of the design considerations endorsed by Battelle and Rockwell International (which conducted the dismantlement of the Sodium Reactor Experiment) include:

- o early consideration to equipment design and location, accessibility and shielding requirements, and other design features which could speed decommissioning, reduce occupational exposure, and create less waste;
- o systematic arrangement of components (short pipelines and transport paths);
- o analysis of facility design and layout based on probable radiation contamination of systems at final shutdown;
- o design of plant components to suit their function including the type of material, ease of cleaning and dismantlement and clear design; protection of surfaces that are difficult to decontaminate (e.g. concrete) with appropriate materials;
- o joints welded to facilitate mechanical cutting; modular concrete structures and/or structures with two layers built into the design so the inner layer will contain all the induced activation; selection of material with regard to induced radiation effects;
- o plans for assessing contamination in concrete structures and surrounding soil.

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Overall, the NRC should require for new plants that decommissioning plans be prepared concurrently with the conceptual design of the facility and revised in parallel with the development of the design. Obviously, none of these design considerations should take precedence over safety objectives.

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III. The DGEIS Is Insufficient to Support the Proposed Rule.

The Commission states that in promulgating the proposed rule, it relies in part on the 1981 Draft Generic Environmental Impact Statement on

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decommissioning, plus comments on the DGEIS. It is impossible to determine what comments might have affected the Commission's evaluation of the environmental impacts of decommissioning, and thus the rule, because no final GEIS has been issued. Presumably, this will become clear when the Commission finalizes this document; however, on its own, the existing analysis cannot support the proposed rule.

The DGEIS should identify the environmental impacts of decommissioning and weigh the costs and benefits of various decommissioning alternatives with sufficient detail and accuracy to assist in the NRC's choice between the alternatives. It does not serve this function adequately, for a number of reasons. First, the information in the DGEIS is out of date. Most of the information and assumptions used are based on the Battelle studies, most of which are at least 5 years old. For example, the cost-benefit analyses use unrealistic cost estimates based on inflation only, rather than on operating experience. Similarly, the discussion of occupational exposure -- the most serious environmental impact of decommissioning aside from the production of vast quantities of waste -- does not begin to analyze conservatively the potential occupational exposures. Just as serious is the failure altogether to consider the health and genetic effects of occupational exposures based on current knowledge of radiation health effects. In fact, the Battelle studies do not even consider gonads "critical" organs.

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Second, the DGEIS does not discuss the cumulative impacts of decommissioning all of the nation's nuclear plants. These impacts include the production and disposal of low, intermediate and high-level wastes, and the

production and disposal of chelated wastes. The associated problems with finding sites in which to bury these residues are also not considered. There are currently only three disposal sites for low-level wastes; NRC's contractors estimate that the decommissioning of each reactor will contribute a volume of low-level waste approximately equivalent to one quarter of the total annual waste currently produced. For instance, the DGEIS gives a little or no attention to the effects of accidents on decommissioning or the impacts associated with the use of chelating agents during decontamination. Nor does the rule discuss the ways in which the availability of disposal sites could affect decommissioning choices. In short, the DGEIS provides no real guidance for a choice between decommissioning options.

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Finally, the rule proposes to require issuance of Environmental Assessments in lieu of Environmental Impact Statements under the National Environmental Policy Act. Based on the gross insufficiency of the DGEIS and the likelihood that each plant will represent a unique combination of operational history and proposed decontamination and decommissioning methods, NRC should require a full EIS to be completed for each plant. If, at some point in the future following the successful decommissioning of many different reactor types, NRC concludes that this process is not necessary, then it may amend the rules to merely require an environmental assessment. There is currently no basis, however, to treat the decommissioning of a particular reactor as if it were not a significant action with an associated complex set of costs and benefits. Moreover, an adequate assessment of the costs and benefits of a particular decommissioning plan cannot be made early in the construction or operation phase of a reactor due to the changing nature of the

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waste disposal situation, the understanding of occupational health hazards, decommissioning technology, etc. The public is entitled to as complete and accurate an evaluation as is possible at the time NRC is considering a licensee's request to begin decommissioning.

F. 1

Date: May 14, 1985

  
Nina Bell, Assistant Director  
Nuclear Information and Resource  
Service



MAIN NUMBER  
PROPOSED RULE PR 34, 50 et al  
(50 FR 5600) (104)

ARKANSAS POWER & LIGHT COMPANY  
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May 13, 1985

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OFFICE OF NUCLEAR REGULATORY COMMISSION

Mr. Samuel J. Chilk  
Secretary of the Commission  
ATTN: Docketing and Service Branch  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

SUBJECT: Arkansas Nuclear One - Units 1 & 2  
Docket Nos. 50-313 and 50-368  
License Nos. DPR-51 and NPF-6  
Proposed Rule on Decommissioning  
Criteria for Nuclear Facilities

Gentlemen:

We welcome the opportunity to comment on the regulations proposed in the February 11, 1985 Federal Register regarding Decommissioning Criteria for Nuclear Facilities. Due to the fact that we are a part 50 licensee, our attached comments apply primarily to the proposed regulations in 10CFR50 and to the impact on part 50 licensees and their customers.

The attached comments point out a number of problems and complications that the proposed regulations raise. We believe that the currently existing regulations in this area are quite adequate. Therefore, we suggest that the resolution of our attached comments is best accomplished by withdrawal of the proposed regulation. This will avoid the many problems which are inherent in the proposed regulation and avoid the issuance of another federal regulation in an area where no more regulation is needed. We believe that issuance of these proposed regulations will needlessly cost taxpayers and electric utility ratepayers (who are the same people) with no increase in their health and safety.

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If any regulation is needed in this area it should be nothing more than criteria for the termination or alteration of licenses at the time a nuclear facility is removed from service. Even here, this would best be accomplished by regulatory guidance in conjunction with the existing 10CFR50.82 instead of by additional regulation.

MAY 20 1985  
Acknowledged by card.....  
pa

MEMBER MIDDLE SOUTH UTILITIES SYSTEM

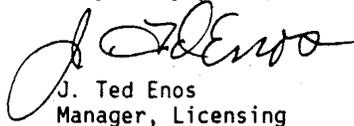
Mr. Samuel J. Chilk

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May 13, 1985

Further details regarding the problems with the proposed regulation and adequacy of existing regulation can be found in the attached comments.

Very truly yours,

A handwritten signature in cursive script, appearing to read "J. Ted Enos".

J. Ted Enos  
Manager, Licensing

JTE:MCS:ds

Attachment

J-430

COMMENTS

1. The introduction of the terms DECON, SAFSTOR and ENTOMB was intended "to reduce the confusion and misunderstanding that existed with the previous terms used to designate decommissioning alternatives". However, the nomenclature of Regulatory Guide 1.86 has been used with good consistency and little confusion for several years and introduction of new terminology into a technology with relatively stable nomenclature would seem to be counter-productive to the stated intent. In fact, since the introduction of this terminology, decommissioning discussions have been forced to use two sets of terminology often erroneously trying to match up the Regulatory Guide 1.86 terminology with the new terminology. Introduction of the new terminology has in actual practice caused greater confusion. This terminology should immediately be withdrawn so that decommissioning can return to a single set of well accepted terms for decommissioning alternatives.
2. Discussions of pros and cons of the three basic decommissioning alternatives, e.g., page 5604, totally neglect the reduced transportation risks and reduced waste disposal site capacity requirements for mothballing and entombment. This is prejudicial to the use of these alternatives. The supplementary information should not so blatantly prejudice the implementation options of the rule.
3. Since, as stated in the supplementary information published with the proposed rule, "decommissioning is not an imminent health and safety problem", there is no reason to limit site activities for licensees beyond the limitations already in place in their license. For example, if a licensee under Part 50 is permitted to remove major components of a system or even whole systems and replace them under the requirements of their technical specification, there is no reason to require separate approval by NRC to not replace them as long as the technical specification or any separate license requirements continue to be met. By definition, if these license requirements are met, no health and safety problem is created. Yet, for Part 50 licensees, proposed 50.82(e) implies that approval is required before decommissioning can take place. This implication is strengthened in the supplementary information by frequent references to approval. In fact, in column three of page 5605, the supplementary information states that plans "would have to be approved by NRC before the start of the major decontamination activities." According to the next page, first column, licensees under parts 30, 40 and 70 are only required to file detail plans "where decommissioning could significantly increase health and safety impacts over those of normal operation". There is no reason to leave Part 50 licensees out of this provision. The only approvals required should be for activities that do not meet the requirements of the license currently held by the licensee. This should be clear in the rule.

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4. The main thrust of the proposed regulation is to establish a level of cost that a licensee will incur in meeting certain NRC requirements and assure that the licensee will collect the funds to cover those costs. This is quite a departure from past NRC practice. We can think of no other establishment of revenue requirements by the NRC. Even in setting requirements for how much insurance must be carried, the NRC does not specify how much must be paid for it. Nor has NRC in the past proposed to establish collection methods for the expenses of its licensees. Indeed, both the establishment of revenue requirements and of revenue collection methods encroach on the authority and regulations of the Federal Energy Regulatory Commission and of State and Local Public Service Commissions, which are expressly protected from NRC encroachment by Chapter 19 of the Atomic Energy Act. In the supplementary information NRC even goes so far as make specifications on the rate of collection by specifying the period of time over which past collection shortages should be made up in the third column on page 5608. In Matter of Houston Lighting & Power Company (South Texas Project, Units 1 & 2), 5 NRC 1303, 1312, n.8 (1977), NRC stated that they had "no authority to regulate certain economic aspects of nuclear power plants, such as rates". Promulgation of the proposed rule effectively does attempt to regulate rates. In 1963 the AEC stated that in its view, the Atomic Energy Act does not provide the Commission the requisite authority to require licensees to post bonds. As a result, they requested in a proposal to the Joint Committee on Atomic Energy that the Atomic Energy Act be amended to provide the Commission with such authority. They were unsuccessful.

D.2.1(a)

D.4.6.1

D.8.1

D.8.3.1

NRC can satisfy its financial assurance objectives without exceeding their authority by requiring a certification by the State Regulatory Commission (and/or FERC) that the licensee (or applicant) is a regulated utility pursuant to State (and/or Federal) law. The Regulatory Commission could demonstrate by citation to appropriate law, that it has authority over the applicant with regard to ratemaking and other economic regulation. We suggest that such an approach be pursued in lieu of the approach proposed in the proposed rule. We believe that NRC's proposed approach transcends their authority and is unnecessary to assure adequate funds for decommissioning.

5. Stating what amounts to a default value for the cost of decommissioning creates the need for an escalation factor. The escalation factor used in the proposed regulation bears only a limited relation to actual total decommissioning cost escalation. Total decommissioning costs are made of such diverse component costs as to preclude any single escalation index from effectively representing total decommissioning cost escalation even as an approximation. Such inherent limitation on any decommissioning cost escalation factor appears to be recognized in column three of page 5606 by projecting a need to modify the regulation in the future to correct for inaccuracies in the escalation factor. This, in effect, acknowledges that use of an escalation factor creates a built in obsolescence for the proposed rule.

D.2.1(a)

6. Probably the only way to eliminate the need for the escalation factor is to eliminate any use of default value, i.e., not state a value that can be used for decommissioning costs in the absence of showing that another value is appropriate. The objective of having such a default value appears to be to minimize the need for licensees to do plant specific studies. In fact, utility licensees will have to do plant specific studies for their rate regulators anyway. In addition, there is no value that is suitable. Decommissioning costs vary widely (by as much as \$100,000,000) from site to site (even between units on the same site), because of the wide variance that exists in the factors that input to the total cost. There doesn't even seem to be a value about which a large majority of plants cluster. As a result, any single value will misrepresent most plants, either high or low or some of each. Furthermore, any such value may be significantly affected by the separate rulemaking under development on permissible levels of residual radioactivity. We suggest that such misrepresentation and obsolescence can be avoided by eliminating any use of a default value of any size. Since there really is no benefit in having one, this should not be detrimental in any way.

D.2.1(a)

The capability to produce quality site specific cost estimates has improved greatly in the past several years. A big step forward in this capability will be taken this summer when the National Environmental Studies Project issues their guidelines on producing decommissioning cost estimates. Preparation of these guidelines has made use of input from utilities, equipment suppliers, contractors, NRC, State Regulatory Commissions, FERC, NARUC and others. With tools such as this guideline to use, there is no reason to degrade the planning in the area of the decommissioning by using a default value or generic estimates.

7. The supplementary information encourages the use of the PNL studies for cost estimates. These studies were never intended to be used as a basis for estimating the decommissioning cost for a specific plant. They were intended to provide the NRC staff with an understanding of the order of magnitude of the costs they were dealing with. In fact, the PNL studies themselves discourage their use in developing plant specific costs. Such use is inappropriate. Encouraging such use through this rulemaking is even more inappropriate.
8. We, and others, have long been concerned that the Commission would propose rules having insufficient flexibility to actually provide adequate financial assurance. The proposed rule is sufficiently flexible, particularly relative to funding methods. However, as noted above, we believe funding method issues to be totally within the jurisdiction of other regulatory bodies. In addition, we believe the staff has not correctly determined the degree of assurance inherent in each of the methods, so we wish to caution the Commission against narrowing the range without having a better understanding of each funding method than we believe now exists. The Commission should recognize that revenue rate regulators often place a high degree of reliance upon the NRC Staff conclusions and, if not careful, may

D.3.1

D.8.1  
D.8.3.1

require funding methods that are detrimental to the interests of ratepayers and the financial viability of the utility, and that could actually reduce financial assurance. Also, Commissioners Bernthal and Asselstine have expressed interest in comments on the vulnerability of the internal funding mechanism for decommissioning funds.

A number of clues in the work of the staff, some of which have carried over to the proposed rule, suggest the staff does not fully understand the funding methods and the degree of financial assurance each provides. Greater financial assurance for external funding methods than for internal funding methods has been taken as a given. This attitude is appropriate only if the NRC concludes that revenue rate regulators will not regulate licensees in a manner that will provide financial viability in the future. The degree of financial assurance rests in part on the speed with which funds are collected from ratepayers and in part on the ability to obtain the cash for decommissioning. The speed of collection is discussed later. With external funding, cash comes either directly or indirectly from the issuer of securities. It would come directly at the maturity of the securities and would come indirectly through the market's valuation of those securities at the time they are sold to obtain the cash for decommissioning. While revenue rate regulators cannot excuse licensees from the liability for decommissioning, they can effectively shift the responsibility for providing the cash from licensees to others. An example is Pennsylvania where licensees are required to externally fund through purchases of the bonds of Pennsylvania municipalities or of the Commonwealth. Thus, Pennsylvania has effectively put the responsibility for providing the cash on its taxpayers. It is unlikely that that provides as much assurance as does a financially viable utility having a large amount of bondable property at the time of decommissioning.

As mentioned earlier, there are two aspects to financial assurance. The ability to obtain the cash for decommissioning was discussed above. The second aspect is the speed with which the fund builds. The Commission realizes that the various funding methods create differences in the costs to be borne by ratepayers. However, these differences may be far greater than the Commission realizes, because the work of the Staff and its consultants have been expressed in terms of the present value of the costs to ratepayers and not in terms of the actual costs. Since depreciation provisions affect rate base, determination of the true impact of any funding method requires consideration of both the depreciation expense and return components of revenue requirements. Revenue requirements in this situation consist of annual depreciation expense, return on rate base, and the income taxes associated with return. The rate base produced by decommissioning expense is negative. The lowest combination of depreciation expense and return and income taxes over the life of any item of property is for Straight-line Depreciation. The Proposed Rules do not mention the existence of Straight-line Depreciation, which might be interpreted as not allowing the use of Straight-line Depreciation. Such an interpretation would significantly decrease the degree of financial assurance.

D. 8.1  
D. 8.3.1

D.3.2.1.1(b)

D.3.3.3

The vast differences in the costs to be borne by ratepayers are illustrated by the patterns of cumulative revenue requirements over plant life on attached Figure 1. The criteria used for the calculations are shown on Table 1. While the criteria on Table 1 are generic, they are not unrealistic. It should be noted that the timing of decommissioning and the magnitude of decommissioning costs are identical for each alternative funding method and have been selected for example purposes only. They do not significantly affect the conclusions. With inflation, the decommissioning cost increases from \$120 million at current price level to approximately \$1.4 billion at the end of plant life. Figure 1 shows cumulative revenue requirements, ranging from ratepayers paying a total of \$907 million for Progressively Paid Invested Fund to being given credit for a total of \$1.624 billion for Straight-line Depreciation. For Prepaid Invested Fund, the total payments would be \$798 million and for Sinking Fund Depreciation \$103 million. Remaining life depreciation with inflation recognized as it occurs is shown to be highly decelerated, which is what causes the ratepayer payments to be the highest (\$467 million) of the internal funding methods.

D.3.2.1.1(b)

A straight-line on Figure 1 indicates equal annual revenue requirements, an upward curvature indicates continually increasing annual amounts, and a downward curvature indicates continually decreasing annual amounts. Horizontal line segments indicate zero annual amounts.

The external methods are sensitive to the after-tax earnings rate used to determine the required fund contributions. The internal methods are sensitive to the pattern of depreciation expenses. All methods are sensitive to the magnitude of inflation.

The revenue requirement patterns on Figure 1 are based on normalizing the difference between book depreciation and income tax depreciation. Other alternatives currently available are flow-through for either internal or external funding, and tax deductible at the time of collection for qualifying external funding. Revenue rate regulators usually require normalizing for nuclear decommissioning costs. The annual revenue requirements for flow-through in early years are higher than for normalization, but total revenue requirements are lower for flow-through. The lowest revenue requirements are for deductible at the time of collection.

The Deficit Reduction Act of 1984 contains a special tax benefit for utilities that use a qualified Progressively Paid Invested Fund, and perhaps that use a Prepaid Invested Fund. At first glance, this appears to be a ratepayer benefit. It is not. The total revenue requirements are almost always higher for any form of external funding with favorable tax treatment (deductible) than for any form of internal funding with unfavorable tax treatment (normalization or flow-through).

D.5

It may be the intention of the NRC that all five funding methods shown on Figure 1 be allowable under the Proposed Rules, but that intention is not clear. All five have been authorized by revenue rate regulatory

D.3.3.3

bodies for use by utilities, and all but Prepaid Invested Fund have been implemented. As the names imply, Prepaid Invested Fund has a single initial investment and Progressively Paid Invested Fund has multiple investments. Prepaid Invested Fund is what the Commission calls Prepayment.

Progressively Paid Invested Fund is what the Commission describes as External Sinking Fund and Segregated Internal Reserve.

Straight-line Depreciation recovers at a constant rate the estimated decommissioning costs at the price level expected at the time of incurrence. Sinking Fund Depreciation is a procedure for calculating decelerated depreciation. It gives the erroneous impression of being cheaper than other alternatives, which makes it appealing to anyone interested in reducing current revenue rates. Both Straight-line Depreciation and Sinking Fund Depreciation are what the Commission calls Internal Reserve.

There has been considerable confusion concerning the significance of the interest rate used to calculate the sinking fund annuity. The interest rate has no significance; it is merely a component of a procedure to calculate decelerated depreciation. The degree of deceleration is controlled by the magnitude of the interest rate used in the calculation. The higher the interest rate, the more decelerated is the pattern of recovery. In fact, Straight-line Depreciation can be thought of in terms of Sinking Fund calculated using an interest rate of zero.

D.3.3.3

Remaining Life Depreciation with Inflation Recognized as it Occurs is based on costs estimated at the price level at the time of measurement rather than the time of incurrence, so is a decelerated procedure for calculating depreciation. It is much more decelerated than Sinking Fund Depreciation, and, like Sinking Fund, has been used to soften the impact on ratepayers of implementing the recovery of decommissioning costs.

The Proposed Rules should not single out any of the three internal funding methods shown on Figure 1, since this can imply which are allowable. Since the Proposed Rules mention only Sinking Fund Depreciation, the Commission may be limiting internal funding to Sinking Fund. Such a limit significantly decreases the degree of financial assurance that is obtainable. There is nothing in the Proposed Rules that indicates that collections currently must be based on the costs measured at the price level expected at the time of decommissioning. The pattern of collections from customers when inflation is recognized as it occurs rather than up front, pushes recovery heavily into the future. Several state regulatory jurisdictions and the Federal Energy Regulatory Commission have required use of this funding method. This funding method provides much less financial assurance than the other methods.

The speed with which the different funding methods build their funds is easily illustrated, again using the calculation criteria on Table 1. Figure 2 compares the funding methods with the decommissioning cost

D.3.2.1.2

measured at each year during the life of the plant. The curves for internal funding methods represent the book reserve and for external methods represent the fund level. The curves show the cumulative difference between the reserve or fund amounts at each year and the cost to decommission in that year. Prepaid Invested Fund is structured so that the fund exactly equals the decommissioning cost each year, so there is no difference between the fund amount and the cost. Only two (Prepaid Invested Fund and Straight-line Depreciation) provide sufficient funds to accomplish decommissioning prior to the normal end of plant life. As shown by the Figure, Progressively Paid Investment Fund plays catch up until the end of plant life and Sinking Fund Depreciation and Inflation Recognized as it Occurs build up a large deficiency and recover only after the end of plant life. If the speed with which the fund is built up is a measure of financial assurance (we believe it is), internal funding through Straight-line Depreciation provides by far the highest level of assurance, given the same ability to turn the fund into cash.

D.3.2.2.1

D.3.2.1.2

In describing the criteria for funding methods the Commission states in the supplemental information that, "Under normal circumstances, the internal reserve would be similar to the external sinking fund in the pattern of funds set aside and should provide adequate funds if a nuclear facility is decommissioned at the end of its expected life" (page 5608). While there are instances of using Sinking Fund Depreciation for high cost facilities, and a few utilities use Sinking Fund for decommissioning cost, utility book depreciation accrual is normally straight-line. As is illustrated on Figure 2, Straight-line Depreciation and External Sinking Fund (Progressively Paid Invested Fund) are not similar.

The Commissioners should be aware that unsegregated internal funding through Straight-line Depreciation will produce greater financial assurance than other funding methods, provided licensees are subjected to competent revenue rate regulation in the future. Whether regulation is competent or not, it is extremely unlikely that electric service will cease to be provided. Therefore, it is reasonable to assume that an entity having the responsibility and the financial wherewithal to accomplish decommissioning will exist at the time decommissioning needs to occur. The argument for eliminating internal unsegregated funding is spurious, often resting on the unsupported (and unsupportable) claim that internal funding does not provide an adequate degree of financial assurance but that external funding does. Shifting from internal to external funding based on such a claim is really a self-fulfilling prophecy, because the shift itself decreases the financial viability of the licensee, thereby decreasing financial assurance. Internal funding provides a high degree of financial assurance. If the NRC staff feels compelled to discuss funding methods, the advantages of internal funding should be more accurately acknowledged. Since funding methods are totally within the jurisdiction of other regulatory bodies they should not be discussed at all.

D.3.2.1.1(b)

D.8.3.1

9. There also seems to be a lack of understanding of the impact on utility financial viability of revenue requirements of the size anticipated for decommissioning. While the revenue requirements are certainly not

D.3.2.1.1(b)

trivial, for most utilities large enough to have built a nuclear power plant, the cash flow requirements created during a decommissioning project are of nowhere near the magnitude needed to raise a credible question regarding the issue of reasonable assurance of the availability of funds. Implications in the supplementary information that issuing bonds against properties purchased or developed with internally held decommissioning collections is the only means of paying decommissioning bills with the "internal reserve" funding method simply ignore the fact that average monthly revenue requirements during a decommissioning project will only be around \$2,000,000 and that the consequences of a project slowdown in the unlikely event of limited funds during a finite period are quite small. The lack of understanding of this fact is really highlighted by a statement in the supplementary information that assurance is the most important criterion for funding methods. Many utilities may elect simply to plan their finances in such a way as to provide the decommissioning funds from internally generated income at the time of decommissioning rather than issue bonds or to provide a substantial portion of those funds in that manner. Of course the option of issuing bonds is certainly available if needed or preferred for some other reason. Under these conditions, the impact on the economic health of individual ratepayers and whole communities due to the widely varying costs of the various funding methods becomes as important a criterion, if not more important, than assurance. De-emphasizing the economic impact on the public is inconsistent with the NRC's responsibilities under the Atomic Energy Act. Even considering the criterion of assurance, the single most important factor influencing the level of assurance is the long-term financial integrity of the utility. As a result of this fact, the provision in proposed 10CFR50.82(c)(1) seems inconsistent with providing assurance since it could require a utility using an internal reserve to produce the total amount needed to fund a 5-6 year decommissioning project at one time perhaps only because they prefer to wait until other units on the same site are ready to decommission. This is based on interpreting the term "fund certification" to mean the certification option proposed in 10CFR50.33(k) as an alternative to a funding plan. The description of this requirement in the supplementary information in column 1 of page 5603 appears to be even more restrictive and, therefore, more detrimental to a utility's financial integrity at the time of permanent unit shutdown. All of this seems to be indicative of an NRC preoccupation with assurance in a way that is actually detrimental to assurance and under conditions when assurance should really not be a prominent issue.

D.3.2.1.1(b)

D.3.3.5

D.3.2.1.1(b)

D.3.4

10. It is entirely appropriate that NRC has distinguished between post-accident cleanup and decommissioning. While decommissioning may follow post-accident cleanup the two are distinctly different activities. Post-accident cleanup funds are adequately assured by regulatory provisions for property insurance and should not be at issue in matters concerning decommissioning.
11. Proposed 10CFR50.54(dd) is good advice. However, the actual impact on public health and safety is negligible. The main impact of a lack of such records is to complicate the decommissioning activities somewhat and perhaps, as a result, to increase the cost a small amount. The

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proposed requirement seems to us to be a classic example of unnecessary regulation and should be deleted, or at worst relegated to a regulatory guidance document. Most, if not all, of these records are kept for other reasons but a regulation for this purpose will require unnecessary documentation of compliance.

C.7.1

12. Imposing the proposed requirements as conditions of operating licenses appears to unnecessarily raise administrative issues regarding modifications to specific funding plans or record keeping provisions. Recent rulings on the "good cause" exception to notice and comment requirements (50 Fed. Reg. 13006) leave in question whether notice and opportunity for comment could be eliminated for rules that specifically amend operating licenses and procedural difficulties have recently arisen in similar situations (Union of Concerned Scientists v. Nuclear Regulatory Commission, 711 F.2d 370). These issues can be avoided by imposing such requirements by regulation instead of also as license conditions without undermining NRC's enforcement authority at all.

C.7.2

D.4.4

13. The definition of decommissioning implies that release for unrestricted use is necessary to provide reasonable assurance of public health and safety. This has certainly never been shown to be the case. If a licensee can provide reasonable assurance of public health and safety some way other than by release for unrestricted use, then NRC has no authority to preclude it. Common usage and any dictionary will define decommissioning as "removal from service". There is no reason to misuse the word in the proposed regulation by linking it with the definition of something else. The definition given is really for decommissioning and decontamination. As presented in the proposed regulation, this definition tends to preclude any option that does not transform fixed radioactive materials to portable ones, place those portable radioactive materials on the nation's transportation system, and place them in another location that may not provide the public with as much protection as some options involving leaving the material on the site location in which it became radioactive. The proposed regulation should not distort the meaning of this common English word nor should it propose to exceed regulatory authority by precluding decommissioning methods that provide reasonable assurance of public health and safety without releasing the site for unrestricted use. This can be corrected by removing all words in the definition following the word "service".

B.1.3

14. The Generic Environmental Impact Statement on Decommissioning Nuclear Facilities (GEIS) properly concludes that the costs and environmental impacts at decommissioning are small compared to the total costs and impacts of building and operating a major facility such as a reactor. It is therefore, appropriate that decommissioning be treated with an environmental assessment rather than an environmental impact statement. We strongly support this conclusion and widely documented facts do also. However, we should point out that the GEIS is still in draft form. In support of this conclusion it should be made final. We have previously submitted comments on the draft GEIS, many of which are relevant to the proposed rule as well. Accordingly, we hereby

F.1

G.20

incorporate our previously submitted comments on the draft GEIS as part of these comments. Those previous comments were submitted on April 30, 1981, by letter from David C. Trimble to the Decommissioning Program Manager in the Office of Standards Development.

G.20

15. There are some ambiguities in the proposed rule related to unique ownership situations that do not directly impact AP&L. However, in the interest of quality regulation we wish to mention them for consideration.

The proposed 10CFR50.33(k)(4)(iv) restricts the acceptability of an internal reserve funding option to "an electric utility owning more than one generating facility". The existence of a wide variety of partial ownership and multiple licensee situations makes this phrase ambiguous. It should be clarified.

D.3.3.2

Do collections for decommissioning costs by non-licensee owners partially satisfy the requirements of the proposed rule? Are they subject to the same restrictions? Other questions of this nature may arise from the proposed regulation since decommissioning costs bear more of a relation to ownership issues than to operational issues.

16. The timing of submittals required under the proposed regulation is tied to the effective date of the proposed regulation. We believe it should be tied to the date of issuance of regulatory guidance in this area. Two years is a reasonable time for preparation of these submittals if regulatory guidance is available at the beginning of the two years. Past experience (10CFR50 Appendix R submittals are prime examples), indicate that submittal preparation efforts can be made to be exercises in futility by the issuance of regulatory guidance after the submittal preparation efforts have begun. This is made even more important by the fact that the issuance of regulatory guidance frequently lags considerably behind the effective date of its associated regulation.

D.4.1.1

17. Commissioners Asselstine and Bernthal have specifically requested comments on the need to consider insolvency and its impact on the continued availability of decommissioning funds. The probability of an electric utility becoming insolvent is extremely remote. It has been over 50 years since an electric utility has gone bankrupt. In addition, as noted in the supplementary information to the proposed rule, "[e]ven financially troubled utilities have sufficient assets to cover the costs of decommissioning". The costs of decommissioning are small compared to the assets of utilities with nuclear power plants. Even in the case of insolvency, since electricity service is considered to be an essential service there will of necessity be a successor to an insolvent utility. Such successor will retain the obligation to decommission. There is no indication that delays in decommissioning caused by such a situation will have any impact on the health and safety of the public. The NRC's own consultant has generally corroborated these conclusions in NUREG/CR-3899. In short, it is our position that utility insolvency is extremely improbable and that its impact on the continued availability of decommissioning funds, even if it occurred, would be negligible.

D.3.2.1.1(b)

18. Commissioner Bernthal's separate views also deserve some comments. His statement that there are no requirements independent from financial review requirements to provide assurance that decommissioning will be accomplished safely is not incorrect. First, there is already a requirement in 10CFR50.33(f) to show reasonable assurance of possessing or obtaining funds necessary to cover the estimated costs of permanently shutting the facility down and maintaining it in a safe condition. The issue of the need for an environmental impact statement for decommissioning is addressed in 10CFR51.5. Decommissioning is referred to in five separate parts of appendices C and F to 10CFR50. The requirements for occupational radiation exposure in the decommissioning process are covered in 10CFR20. In addition and perhaps most obvious, 10CFR50.82 gives NRC broad powers to intervene in the decommissioning process and insures basic safety standards by explicitly extending the generic standards in 10CFR to cover decommissioning. In addition to regulations, but still within the NRC's regulatory scheme, Regulatory Guide 1.86 provides a comprehensive discussion of criteria for decommissioning. Indeed the above mentioned pieces of the NRC's regulatory scheme for decommissioning are but the most prominent. Seven pages of titles of regulations and regulatory guidance and standards for decommissioning are listed in NUREG/CR-0671. As for abandonment, the above cited regulations do not permit it and the sites on which nuclear power plants are located are of considerable value to utilities. As noted in earlier comments, the costs of decommissioning are a small part of the cost of utility operation. There really would be little if any incentive to abandon such a valuable site, even from an economic viewpoint. When the aspects of community responsibility, legal liability and existing regulatory requirements are factored in, the likelihood of abandonment becomes absurd. Regarding incentive to dedicate funds in advance, if there is no such incentive (as Commissioner Bernthal suggests) why does virtually every utility do so? A survey of more than 30 investor-owned utilities in October 1983 found only one state not presently allowing recovery of decommissioning costs in present rates and that one state had only deferred recovery of decommissioning costs pending the outcome of a generic proceeding. Utilities also have an interest in collecting funds for decommissioning from the customers benefiting from the plant to be decommissioned (instead of customers at the time of decommissioning), because that is equitable. In short, Commissioner Bernthal's separate views do not take into account existing regulatory requirements, utility incentives even without the proposed regulations and the fact that the industry has taken the initiative to address decommissioning concerns even without the proposed regulations.

D.8.1

TABLE 1

CRITERIA FOR DETERMINATION OF REVENUE REQUIREMENTS

1. Decommissioning cost \$120,000,000 at current price level.
2. Decommissioning to take six years, with planning starting two years prior to end of operating life.
3. Annual inflation rate - 6.0%.
4. Plant operating life - 40 years.
5. Effective tax rate - 46%.
6. After-tax earnings from external investments equal to inflation.
7. Capital structure and cost

<u>COMPONENT</u>	<u>STRUCTURE</u> %	<u>COST</u>	
		<u>CONVENTIONAL</u> %	<u>NET OF TAX</u> %
Long-term Debt	55	12.0	6.24
Preferred Stock	10	12.0	12.00
Common Stock	<u>35</u>	15.0	15.0
	100	13.05	10.01

8. Sinking fund calculations based on an ordinary annuity and Modified Sinking Fund Depreciation.

Figure 1

# Nuclear Decommissioning Funding

Effect of Funding Method

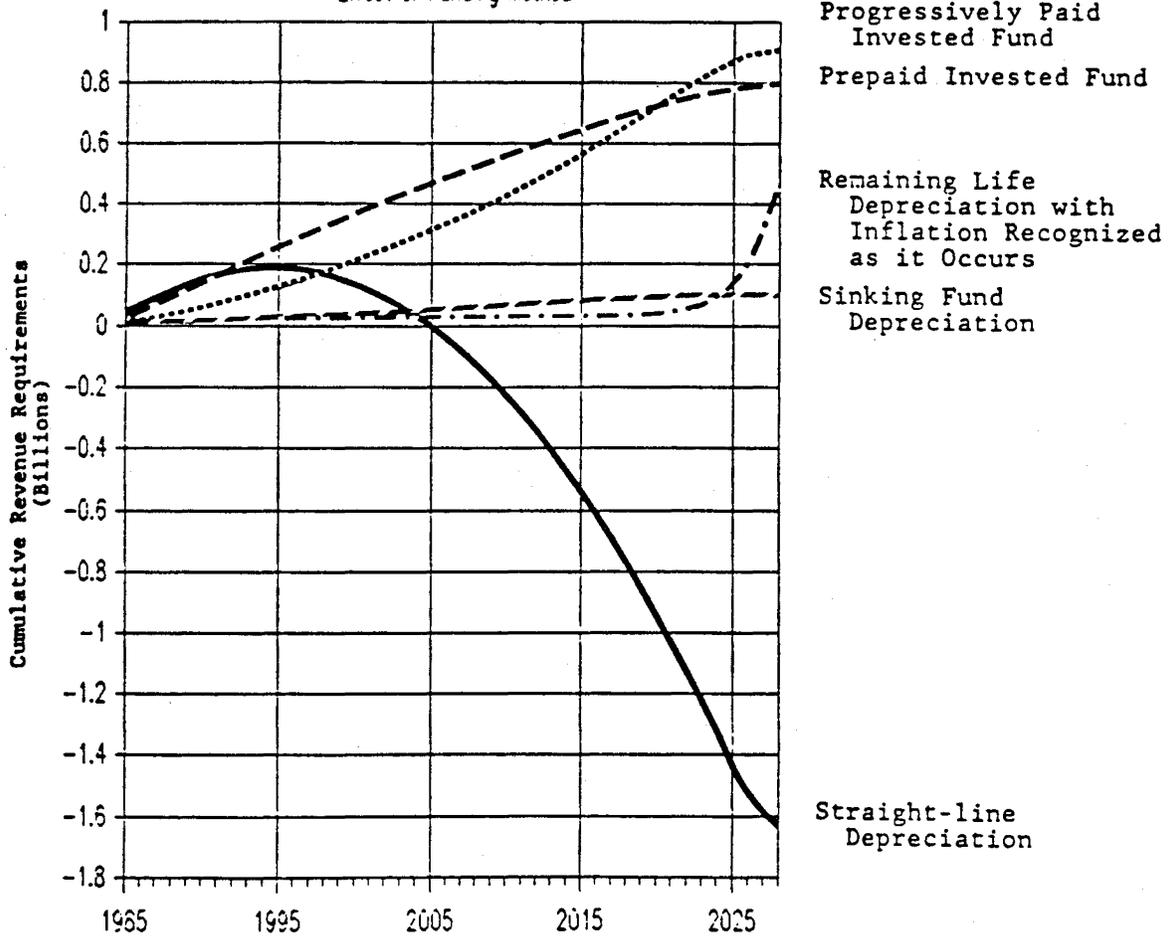
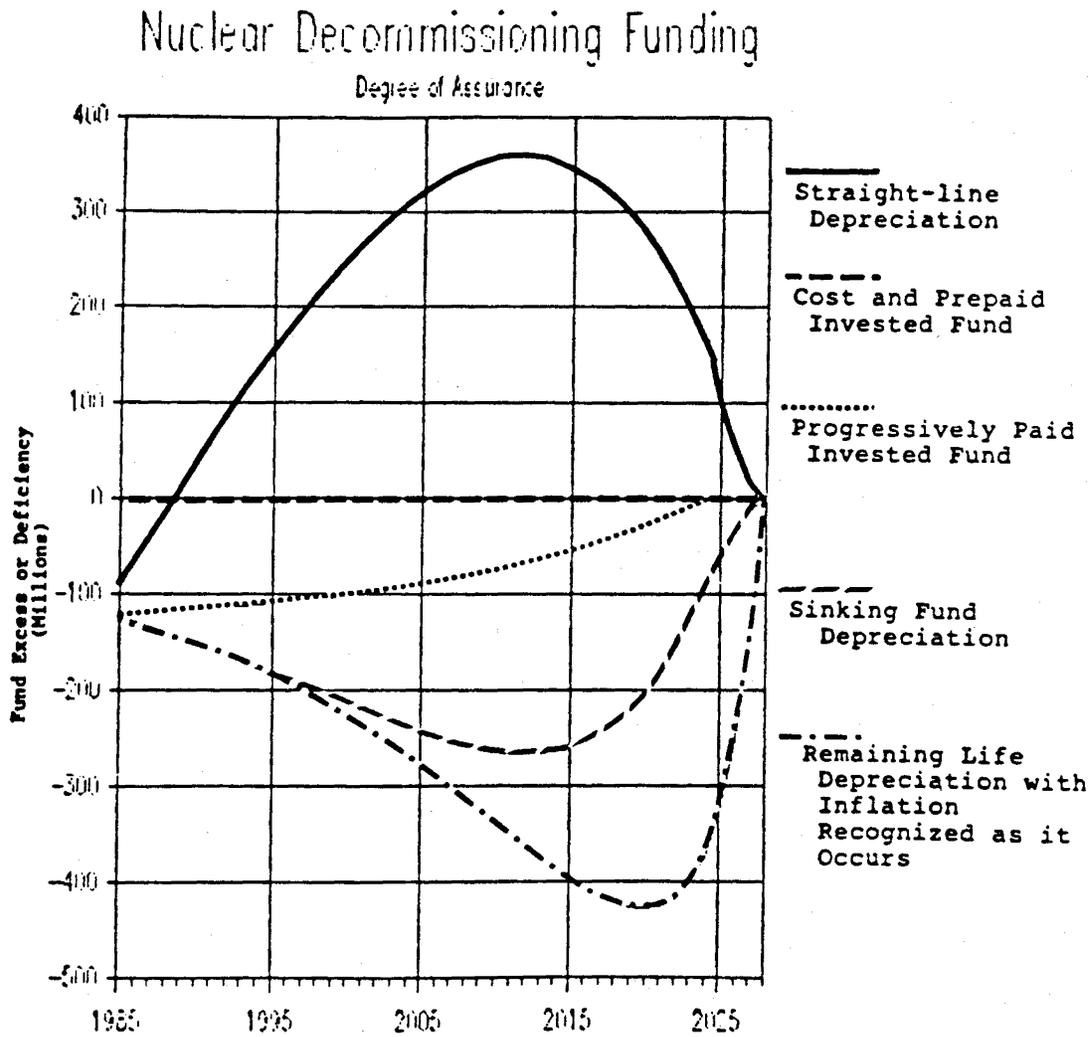


Figure 2





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JAMES BURNER  
PROPOSED RULE **PR-30,40,50 et al**  
(50 FR 5600) (105)

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May 9, 1985 DOCKETED  
USNRC

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OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555  
Attention: Docketing and Service Branch

Gentlemen:

The Duquesne Light Company welcomes the opportunity to provide comments on this issue of decommissioning. We share the same concerns as the NRC in that adequate planning must exist in order to assure successful decommissioning. A draft decommissioning study has already been prepared for Beaver Valley Unit 1 and a trust fund has been established for the purpose of funding our decommissioning effort. We will have a method of assuring that decommissioning can be performed at our units, and believe that regulations providing acceptance criteria are beneficial, however, several aspects of the proposed rule on the decommissioning criteria require comment:

Comment 1:

A rule specifically requiring a demonstration of the capability to finance decommissioning is not necessary for electric utility licenses.

This comment is consistent with the action taken by the NRC in September 1984 to eliminate financial qualifications from the operating license review, since financial qualifications had already been determined during the construction license review.

D.8.1

Comment 2:

The Commission should make a generic finding that the utility ratemaking process and the financial structure of the utility industry provide sufficient financial assurance.

Comment 3:

Any rule should acknowledge that the selection of specific funding methods is the prerogative of utility rate regulators.

D.8.3.1

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*pk*

Comment 4:

Any rule should recognize that the purpose of the generic cost estimates done during the NRC's re-evaluation are for bench marking costs and have no applicability to specific units.

A number of rate regulatory jurisdictions have placed undue reliance on generic cost estimates in regulatory proceedings when the effect of using such estimates was to reduce the total cost. Many of these instances were in proceedings having site-specific cost estimates.

The original NRC decommissioning studies provided beneficial information but the cost information has been misused. The AIF/NESP study on decommissioning guidelines now underway would provide licensees a methodology for developing site-specific cost estimates that would be accepted by regulators.

The rule should state that the \$100 million cost is not fixed but one that has been developed for reference purposes only.

Individual regulatory agencies must be left with the responsibility of determining the utility cost requirement.

D.2.1(a)

D.2.1(b)

Comment 5:

Any rule should not impose regulatory requirements as conditions of operating licenses.

Including decommissioning requirements as part of operating license conditions provides an opportunity for continued plant operations to be placed in jeopardy if the financing plan does not meet the NRC Staff's approval, even though there is no safety concern.

Various programs referenced in the regulations are in place at all utilities and exist without being a condition of the operating license. An acceptable decommissioning plan with the regulations as its basis is an acceptable approach which does not require addition to the operating license.

C.7.2

D.4.4

Comment 6:

From a technical standpoint, the current NRC regulations as applicable to decommissioning in 10CFR50 are adequate.

G.1

Comment 7:

Any rulemaking should be oriented toward the objective of license termination rather than on the decommissioning process.

E.1.1

Comment 8:

Maximum flexibility should be included in a rule in order that a final decision regarding decommissioning can be made by the utility at a time nearer the cessation of plant operation.

C.2.2

Comment 9:

Existing record-keeping requirements are sufficient for termination of license activities and should not be amended. However, if direction is provided in a final rule, it should be limited to those events resulting in the spread of contamination outside of radiologically controlled areas identified in the Updated FSAR. The rule should recognize established programs as being successful in accomplishing this concern.

C.7.1

Comment 10:

The residual radioactivity limit of 50 mREM/yr which the NRC staff is considering appears to be reasonable but should be adaptable to site-specific factors. Compliance using realistic pathway analysis is feasible and desirable.

E.1.1

Since the Commission is considering radiological criteria for decommissioning under separate rulemaking action, it would appear prudent to not issue a final decommissioning rule until 10CFR Part 20 has been finalized containing specific limits on residual radioactivity. These criteria are an integral part of any decommissioning plan and proper cross-references between the two regulatory actions is needed. The proposed rulemaking contains ambiguous and unquantifiable terms which should be removed and replaced with specific references to parts of 10CFR20. (i.e., 10CFR30.36.c.1.ii contains the wording "...to the extent practicable...")

E.2

The Commission states in this proposed rulemaking that "...it is expected that contamination levels considered suitable for release for unrestricted use will not be changed significantly enough to affect cost estimates...". Since the cost of decommissioning is significantly dependent on the criteria which will be applied, it is requested that a thorough cost benefit analysis be performed prior to codifying residual radioactivity levels.

E.1.1

Comment 11:

Proposed section 51.55 contains a requirement for the applicant to retain 109 additional copies of the environmental report or any supplement to the report. The purpose is to have additional copies available for distribution to parties and Boards in the NRC proceeding for federal, state and local officials and any affected Indian tribes. We understand the intent of this proposed regulation is to assure affected parties have access to this information.

H.5

Secretary of the Commission

May 9, 1985

Page 4

It is not our desire to withhold information that will be useful in resolving contentions which may arise in any future proceedings. However, all docketed information is available through the NRC public document room and copies could be made available upon request from various agencies. A requirement to have available 109 additional copies appears to be arbitrary and without basis. It is, therefore, requested that this part of the proposed rule be deleted.

H.S

These comments are reflective of the Utility Decommissioning Group and the Atomic Industrial Forum and we endorse those common points of concern regarding this rulemaking.

Very truly yours,



J. J. Carey  
Vice President, Nuclear

cc: U. S. Nuclear Regulatory Commission  
c/o Document Management Branch  
Washington, DC 20555



DOCKET NUMBER PR-30, 40, 50 et al  
PROPOSED RULE (50 FR 5600) 106

CHARLES CENTER • P. O. BOX 1475 • BALTIMORE, MARYLAND 21203

THOMAS F. BRADY  
ASSISTANT SECRETARY  
AND  
ASSISTANT TREASURER

DOCKET  
USNRC

May 13, 1985

'85 MAY 20 A11:14

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Dear Sir:

Baltimore Gas and Electric Company is pleased to comment on the Commission's proposed rule, "Decommissioning Criteria for Nuclear Facilities," published in the Federal Register on February 11, 1985.

BG&E is an investor-owned utility engaged primarily in the business of producing and selling electricity and purchasing and selling natural gas. The Company, which is the oldest gas utility and one of the oldest electric utilities in the United States, serves an area which includes Baltimore City and all or part of nine central Maryland counties. The area served with electricity approximates 2,300 square miles with 2,343,000 residents while the area served with gas includes 600 square miles with a population of 1,807,000. The rates charged by the Company to provide these services are established in formal rate proceedings before the Public Service Commission of Maryland. Because over half of the Company's electric generation is produced by the Calvert Cliffs Nuclear Power Plant, the Company is very interested in the Commission's proposed decommissioning rules.

In general, BG&E considers the determination of the funding method to be the most critical issue and is strictly a question of specifying what is an acceptable level of risk for funding the decommissioning operation in light of the associated costs. It is obvious that a prefunding approach minimizes the risk, but could prove to be unjustified in the appropriate circumstances where the inherent risk of the funding operation does not warrant the much higher costs which would be borne by ratepayers. The Company strongly supports the features of the proposal that provide for the continued acceptability of internal reserve as an appropriate method of funding decommissioning costs. The Company believes that in its circumstances an internal reserve provides reasonable assurance of availability of funds. The ability to assemble the necessary funds through internal generation and the capital markets is a basic premise on which the Company's overall business is conducted. Furthermore, the Company's internal reserve method is less costly than the other alternative funding methods thereby shielding our ratepayers from undue costs without the incurrence of unnecessary risks. Thus, in order to best meet the needs of both electric customers and the public in general, the decision as to which funding method to employ must be made on a case by case basis.

D.3.2.1.1(b)

D.3.1

Sincerely,

Acknowledged by card MAY 20 1985 pd

DOCKET NUMBER  
PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (107)



Consumers  
Power  
Company

David J VandeWalle  
Director of  
Nuclear Licensing

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-1636

DOCKETED

May 10, 1985

'85 MAY 20 AM 11:13

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Samuel J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Att: Docketing and Service Branch

Consumers Power Company appreciates the opportunity to comment on the proposed rule regarding decommissioning criteria for nuclear facilities (50FR5600). After careful review and evaluation by various Consumers Power Company personnel, our comments on the proposed rule are:

- Consumers Power Company disagrees with the proposed use of an inflation rate of twice that indicated by the Consumer Price Index (CPI). The use of a "2x" multiplier does not take into consideration technological improvements in decommissioning or the use of regional burial facilities. The following table shows the impact of doubling the CPI when the prescribed amount (\$100,000,000) is inflated to the year 2000 when, for example, the operating license for our Big Rock Point Plant will expire.

CPI	1x	2x
3%	\$160,470,000	\$254,035,000
5%	\$218,287,000	\$459,497,000
7%	\$275,903,000	\$713,794,000

D.2.1(a)

We believe that the increase in annual decommissioning funding caused by using the "2x" multiplier represents an unnecessary burden to the customer and may result in overfunding. Decommissioning funding amounts are based on the estimated decommissioning cost at the time a plant is retired. Periodic review on a three-to-five year basis would allow for adjustments to be made for inflation and changes in the interest rate of an external fund is used.

D.2.1(b)

- The requirement of the proposed addition to 10CFR50.54(cc)(1) to provide financial assurance for decommissioning two years after the effective date of the final rule is considered to be too restrictive. Consumers Power Company recommends a period of 5 years after the

D.4.1.1

OC0585-0004A-NL03

Acknowledged by card... MAY 20 1985

J-450

effective date of the final rule, but not later than 5 years prior to the projected end of plant operations.

| D.4.1.1

In conclusion, Consumers Power Company agrees that a rule such as the one proposed is beneficial in that it will help assure the availability of funds necessary to carry out decommissioning.

| D.8.1  
| G.1



DJVandewalle  
Director, Nuclear Licensing

**PNM**

**PUBLIC SERVICE COMPANY OF NEW MEXICO**

ALVARADO SQUARE ALBUQUERQUE, NEW MEXICO 87158 - - - -

DOCKET NUMBER  
PROPOSED RULE **PR-3040, 50 et al**  
**(50 FR 5600) (108)**

May 16, 1985

DOCKET  
USNRC

Secretary of the Commission  
Nuclear Regulatory Commission  
Washington, DC 20555

'85 MAY 20 AM 1:17

Subject: Comments on Proposed Regulations Regarding  
Decommissioning Criteria for Nuclear Facilities  
OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Mr. Secretary:

Public Service Company of New Mexico (PNM) wishes to comment on 10 CFR, parts 50 and 51 of the proposed regulations published in the Federal Register, Volume 50, Number 28.

In order to select a decommissioning funding alternative which minimizes the impact to its ratepayers and also provides adequate funding assurance, it is important that electric utilities have a number of alternatives from which to choose. PNM, therefore, would oppose the deletion of any of the four alternatives proposed in the subject regulations. In addition, PNM supports the Staff recommendation which would permit the use of unsegregated internal funding for electric utilities.

D.3.1  
D.3.2.1.1(b)

PNM agrees that decommissioning funding methods need to be adjusted periodically for inflation but instead of annual adjustments, these adjustments should be made at five-year intervals. Inflation adjustments at five-year intervals would serve to mitigate annual perturbations in the Consumer Price Index.

D2.1(b)  
D.4.3

Finally, PNM opposes any regulation which sets a prescribed amount for the level of funding assurance. The amount of funds assured should be based on a facility-specific cost estimate and not on the generic scenarios outlined in NUREG/CR-0130 and 0672.

D2.1(a)

If you wish to discuss any of the comments I have offered above, please contact me at (505) 848-4453.

Sincerely,

*Donald A. Begley*  
Donald A. Begley  
Manager, Rates and Regulation

JEW:wp

Acknowledged by card... MAY 20 1985  
*pd*

JACKET NUMBER  
PROPOSED RULE **PR-3940, 50 etal**  
**(50 FR 5600)** **(109)**

IOWA STATE COMMERCE COMMISSION

Commissioners  
Andrew Varley  
Christine A. Hanson  
Paul Franzenburg

Executive Secretary  
Robert G. Meletz

May 10, 1985

U.S. NRC

'85 MAY 20 11:23

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Gentlemen:

This is to comment on your proposed rules for decommissioning of nuclear facilities in the Federal Register for February 11, 1985, beginning at 50 FR 5600.

Our interest is primarily in the mechanisms for requiring financial assurance for electric utility production facilities under Part 50.

At 50 FR 5609 it states that NRC Commissioners Asselstine and Bernthal would like comments on whether to allow unsegregated internal funding or not allow unsegregated internal funding for decommissioning. This relates to the possibility of insolvency and impact on availability of decommissioning funds.

D.3.2.1.1(b)

Please retain the proposed rule which allows unsegregated internal funding. The level of financial risk should be acceptable and may result in lower rates to electricity consumers.

The opportunity to comment is appreciated.

Sincerely,

  
Andrew Varley  
Chairman

AV:gb

Acknowledged by card MAY 20 1985

LUCAS OFFICE BUILDING - DES MOINES, IOWA 50319

*pd*

J-453

PROPOSED RULE PR-30,40,50 et al  
(50 FR 5600) (110)



Curtis Eschels  
Chairman

STATE OF WASHINGTON

ENERGY FACILITY SITE EVALUATION COUNCIL

Mail Stop PY-11 • Olympia, Washington 98504 • (206) 459-6490 • (SCAN) 585-6490

May 14, 1985

DOCKETED

'85 MAY 20 AM 11:24

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Docketing and Services Branch

Dear Secretary:

The Washington State Energy Facility Site Evaluation Council has reviewed the proposed amendments addressing decommissioning criteria for nuclear facilities as they may apply to power reactors. The statutory authority of the Council extends to nuclear power plants with a generating capacity of two hundred fifty thousand kilowatts or more.

The Council's immediate assessment of the proposed amendments is that several very necessary concepts have been incorporated and refined as a part of the decommissioning program. These are the five major issues of decommissioning: alternatives, timing, planning, financial assurance and residual radioactivity. Of these five, the single most important may evolve to be that of financial assurance.

D. 8.1  
G. 1

We are concerned that under the proposed amendments an unusually long period may exist at any power reactor where no decommissioning plan has been prepared. This results from the plan development process being triggered by the licensee's decision to terminate operations. This requirement appears to omit the untimely or unprogrammed termination resulting from an accident or unpredictable technological event. It is suggested that a preliminary plan development process begin immediately following commencement of commercial operations.

C. 2.3  
C. 2.1

During the final plan development process there should be cooperative three-way discussions between the power reactor licensee, the Nuclear Regulatory Commission and Washington State. This is particularly appropriate for agreement states in general, and more so where specific agreements have been executed concerning the decommissioning of nuclear facilities such as with the state of Washington. These requirements should be provided for in the proposed amendments.

G. 2

Acknowledged by card ..... MAY 20 1985 [Signature]

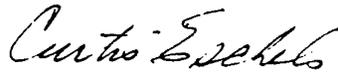
Secretary of the Commission  
May 14, 1985  
Page 2

Lastly, it is suggested that the NRC conduct a series of public hearings throughout the country to inform the people of the purpose and scope of the proposed amendments. This is essential to the public's understanding and perception of nuclear power.

| G.1

The Energy Facility Site Evaluation Council is appreciative of the opportunity to comment on the proposed amendments.

Sincerely,



Curtis Eschels  
Chairman

CE:WLF:ab



**PSE&G** Public Service  
Electric and Gas  
Company

DOCKET NUMBER  
PROPOSED RULE **PR-30,40,50 et al**  
(50 FR 5600) (111)

80 Park Plaza, Newark, NJ 07101 / 201 430 8217 MAILING ADDRESS / P.O. Box 570, Newark, NJ 07101

Robert L. Mittl General Manager  
Nuclear Assurance and Regulation

May 13, 1985

DOE-EE  
USNRC

'85 MAY 20 A11:25

Mr. Samuel J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Mr. Chilk:

DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES  
50 FR 5600; 10 CFR 30, 40, 50, 51, 70, 72

We have reviewed the February 11, 1985 Federal Register publication of NRC's proposed rule setting forth technical and financial criteria for the decommissioning of licensed facilities. We support the intent of the proposed rule-- to provide reasonable assurance that adequate funds are available to ensure that decommissioning is accomplished in a safe manner. We find acceptable the four alternatives available to a licensee for funding. The funding level specified in the proposal for electric utility licensees, \$100,000,000 (1984 dollars) per unit, is in agreement with current industry estimates.

G.1  
D.3.2.1.1(b)  
D.3.1  
D.1.1.1  
D.2.1(b)

However, the proposal for the inflation adjustment is of concern. The recommended factor of two times the change in the Consumer Price Index (CPI) is excessive. An adjustment equivalent to inflation would be sufficient to maintain the necessary funding. Even though, under the proposal, the excessively high inflation adjustment index could be reduced if experience warranted, its use would be detrimental to PSE&G since it would require an excessive and unnecessary provision of funds.

D.2.1(a)  
D.2.1(b)

In summary, we support the NRC's proposed funding alternatives as outlined in the proposed rulemaking, with the exception of the provision for escalation at twice the CPI.

D.8.1

Very truly yours,

*R. L. Mittl / SCR*

The Energy People

Acknowledged by card MAY 20 1985

*pa*

J-456

PROPOSED RULE NUMBER PR-30,40,50 et al  
(50 FR 5600) (112)



GPU Nuclear Corporation  
100 Interpace Parkway  
Parsippany, New Jersey 07054-1149  
(201) 263-6500  
TELEX 136-482  
Writer's Direct Dial Number:

DOCKETED

'85 MAY 20 AM 11:26

May 13, 1985

OFFICE OF GENERAL  
DOCKETING & SERVICE  
BRANCH

Mr. Samuel J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Dear Mr. Chilk:

Subject: Request for Comments on Decommissioning  
Criteria for Nuclear Facilities Proposed Rule

The staff of GPU Nuclear Corporation (GPUN) herewith submits comments on the subject proposed rule. Comments were requested in a February 11, 1985 Federal Register notice (50 FR 5600).

GPUN endorses the comments sent to the Commission by the Atomic Industrial Forum Subcommittee on Decommissioning. We find these comments to be fairly comprehensive and complete. We do, however, wish to emphasize two points made by the AIF and add one comment of our own.

Item 7 of the AIF comments states that there is need for the NRC to develop suitable criteria for residual radioactivity limits. We believe that this is an essential precursor for any decommissioning planning. If the definition of acceptable level of residual radioactivity for the release of property for unrestricted usage is not established, how can a licensee finalize a decommissioning plan? Those involved in decontamination work have seen that the cost of reducing the radioactivity level, say, 90% might cost X millions of dollars and the next 5-6% might cost another X millions, doubling the cost. Therefore, not knowing ahead of time just "how clean is clean enough" leaves licensees with an open-ended planning commitment.

E.2

Another AIF comment we would like to expand upon is item 12b. As the AIF states it, this comment deals with the possibility of both a Part 50 and a Part 72 installation being situated at the same site with one license expiring before the other, and the desirability of having "decommissioning" await the completion of all site operations. GPUN endorses this idea, but suggests that the same scenario can and does exist where both units hold Part 50 licenses and the regulations should emphasize the value of decommissioning more than one unit at the same time.

B.4.2

GPU Nuclear Corporation is a subsidiary of General Public Utilities Corporation

Acknowledged by card MAY 20 1985 *pk*

Lastly, GPUN suggests that thought be given to codifying the concept of "possession only" licenses within 10 CFR. This would clarify the time frame within which licensees would be able to reduce the requirements of such items as the Security Plan, Emergency Plan, Operator Requalification Training and other requirements of the standard Class 103 license, all of which now are done on a case-by-case basis, via Regulatory Guide 1.86.

C.1.6

Sincerely,



J. R. Thorpe  
Director  
Licensing & Regulatory Affairs

RPJ:dls:1785f

DOCKET NUMBER  
PROPOSED RULE **PR-30, 40, 50 et al**  
(50 FR 5600) (113)

Arizona Public Service Company  
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

PAUL A. WILLIAMS II  
VICE PRESIDENT  
AND TREASURER

May 16, 1985

DOCKET  
USNRC

'85 MAY 20 12:18

Office of the Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attn: Docketing and Service Branch

Re: Decommissioning Criteria for Nuclear Facilities,  
10 C.F.R. Parts 30, 40, 50, 51, 70 and 72,  
50 Federal Register 5600, February 11, 1985

Gentlemen:

Arizona Public Service Company ("APS" or the "Company") hereby submits its comments in response to the above-captioned notice of proposed rule amendment (the "Proposed Rule").

APS is an investor-owned utility engaged in the generation, transmission, distribution and sale of electricity to approximately 500,000 customers within the State of Arizona. APS is also a principal participant in and the Operating Agent of the Palo Verde Nuclear Generating Station (PVNGS) located within the State of Arizona.

The Company is a member of the Atomic Industrial Forum ("AIF"), which is a participant in these proceedings. APS endorses the comments of AIF as submitted in these proceedings and will therefore only comment briefly on certain aspects of the Proposed Rule.

As discussed in the Proposed Rule, the "wide diversity in types of nuclear facilities necessitates that the NRC allow latitude in the use of funding methods" (50 Fed. Reg. 5607). The Internal Reserve is among the funding alternatives which the NRC has determined would provide reasonable assurance of funding. APS endorses this method as the most effective funding mechanism available to utilities while at the same time providing reasonable assurance of funds.

D.3.2.1.1(b)

Acknowledged by card..... MAY 20 1985 *pd*

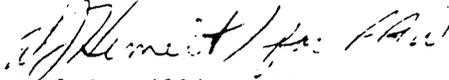
Office of Secretary of the Commission  
May 16, 1985  
Page 2

APS is pleased to note in the discussion in the Proposed Rule that the NRC's concern regarding "premature decommissioning" has been somewhat alleviated. As stated (at 50 Fed. Reg. 5606), the availability of funds for post-accident cleanup is related to financial assurance for decommissioning. However, while the two may, in certain circumstances, be related, they are two separate functions. Assurance of funds for post-accident cleanup is more properly covered by use of insurance, while decommissioning is not a function of insurance. Accordingly (and quite properly), the NRC did not include the funding requirements for accident cleanup in the Proposed Rule but is considering them in 10 C.F.R. § 50.54(W), which is currently being revised. (See Mandatory Property Insurance for Decontamination of Nuclear Reactors - 10 C.F.R. Part 50, 49 Fed. Reg. 44645, November 8, 1984.)

D.3.2.2.1

APS appreciates the opportunity to comment in these proceedings. If your office has any questions or APS can be of any assistance, please contact Norm Cocanour, APS Risk Management Administrator, at (602) 271-2916.

Sincerely,



Paul A. Williams II  
Vice President  
and Treasurer

PAW/TLH/mk

BOOK NUMBER  
RECORDED CASE PR-3440, 50 et al  
(50 FR 5600) (114)



LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION  
P.O. BOX 618, NORTH COUNTRY ROAD • WADING RIVER, N.Y. 11792

JOHN D. LEONARD, JR.  
VICE PRESIDENT - NUCLEAR OPERATIONS

COCKETER  
USNRC

May 20, 1985

'85 MAY 22 P1:43

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Mr. Samuel J. Chilk, Secretary  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: Request for public comment on the  
proposed rule changes to 10 CFR  
Parts 30, 40, 50, 51, 70 and 72 -  
Decommissioning Criteria for  
Nuclear Facilities.

Dear Mr. Chilk:

On Monday, February 11, 1985, the NRC published the subject request for comment in the Federal Register. The Long Island Lighting Company wishes to provide the following comments and observations on the subject.

Our views on the financial assurance of decommissioning generally coincide with those of the Utility Decommissioning Group (UDG) and the Edison Electric Institute (EEI) as endorsed by the Atomic Industrial Forum. In short, a utility operating a power reactor facility will build into the rate base an acceptable funding process to ensure decommissioning costs.

On September 12, 1984, (Vol. 49 FR No. 178) the Commission issued its Final Rule eliminating the need for a financial qualifications review for electric utility applicants for operating licenses. LILCO believes that rulemaking on financing of decommissioning might well be viewed in the same category. While the cost of decommissioning is intrinsically a large sum of money, it represents a relatively small portion of a utility's total cost of service and it is comparable to other costs such as the NRC's safety requirements which were at issue in the financial qualifications rulemaking. As the Commission recently noted in the financial qualifications matter, it has been long established that utilities are bound by their respective utility commissions to set their rates such that all reasonable costs of serving the public are covered. (See Vol. 49 FR No. 178 at pg. 35748).

submit that decommissioning represents legitimate costs that can reasonably be factored into the rate base established for a commercially operating nuclear reactor power plant to recover the estimated costs of decommissioning along with other legitimate and recognized costs of electric power generation.

D.3.2.1.1(b)

D.8.1

ACKNOWLEDGED BY CARD..... MAY 23 1985 [Signature]

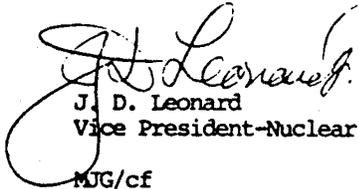
Page 2

Additionally, LILCO agrees with UDG's and EEI's views that regulatory requirements that result from decommissioning rulemaking should not be imposed as conditions of the operating license. For example, a regulatory requirement, if needed, to submit periodic financial plans should be in the regulations but should not be a license condition. As such, it would be enforceable without possibly placing continued plant operation technically in jeopardy.

C.7.2  
D.4.4

LILCO wishes to thank the Commission for this opportunity to express its views on this important issue which reviews the questions of decommissioning of nuclear power stations at the end of operations.

Very truly yours,

  
J. D. Leonard  
Vice President-Nuclear Operations  
MJG/cf

J-462

INDEX NUMBER  
PROPOSED RULE **PR-30,40,50 et al.**  
**(50 FR 5600)** **(115)**



**KERR-MCGEE CORPORATION**

KERR-MCGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73126

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

May 13, 1985

FEDERAL EXPRESS  
ZAP MAIL

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

ATTENTION: Docketing and Service Branch

DOCKETED  
USNRC

'85 MAY 23 P1:40

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

RE: Proposed Rule - Decommissioning Criteria for  
Nuclear Facilities; 50 Federal Register 5600  
(February 11, 1985).

Dear Mr. Secretary:

Sequoyah Fuels Corporation owns and operates a uranium conversion facility near Gore, Oklahoma. Since the subject proposed rule, if promulgated, would change the manner in which Sequoyah Fuels provides financial assurance for decommissioning, the following comments are submitted thereon.

Proposed Rule 10 CFR 40.36 provides two methods for nongovernment licensees with existing facilities to demonstrate their financial ability to decommission those facilities. Such financial assurance can be provided either through surety methods or an external sinking fund. Should a licensee want to use another funding method, it must "demonstrate" to the Commission that this method is "comparable" to those mentioned above.

Sequoyah Fuels does not use either of the methods proposed to fulfill the Commission's financial assurance requirements. - Since it is difficult to determine in advance whether the Commission would find this company's method "comparable" to those in the proposed rule, Sequoyah Fuels respectfully requests that it be included in the final rule.

The company's method for assuring decommissioning funds can be described as follows:

D.6.4.1,2  
D.6.4.2

MAY 23 1985

Acknowledged by card.....  
*pa*

Secretary of the Commission  
50 Federal Register 5600 (comments)  
May 13, 1985  
Page Two

1. Decommissioning costs are estimated.
2. A reserve account in the amount established in No. 1 above is established and updated annually.
3. The reserve account recognizes the decommissioning costs as an expense and income is reduced accordingly.
4. An independent public accounting firm examines the company's financial statement and accounting records and reports to the Commission concerning the existence and amount of the reserve account for decommissioning the facility in question.

Sequoyah Fuels believes that this method of financial assurance is preferable to those proposed since it does not involve the cost of a surety bond, and it allows the continued use of these funds until decommissioning is due to commence. Further, the reliability of this method is currently being demonstrated by the company in its decommissioning of the Cimarron Facility. We urge the Commission to adopt the reserve account method in 10 CFR 40.36(c).

If you have any questions, please call me at (405) 270-2623.

Very truly yours,



J.C. Stauter, Director  
Nuclear Licensing & Regulation

JCS/br

D.6.4.1.2

DOCKET NUMBER

PROPOSED RULE

(50 FR 5600)

PR-30, 40, 50 et al

116

Washington Public Power Supply System

3000 George Washington Way P.O. Box 968 Richland, Washington 99352-0968 (509)372-5000

May 17, 1985  
G02-85-256

DOCKETED  
USNRC

'85 MAY 23 11:24

Mr. S. J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Mr. Chilk:

Subject: COMMENTS ON PROPOSED RULES ON DECOMMISSIONING

The Washington Public Power Supply System has reviewed the proposed rules on decommissioning. We have forwarded our comments to the Atomic Industrial Forum, and they have incorporated our comments into their submittal. We would like to be on record as supporting the AIF position on decommissioning.

Thank you for your consideration in this matter.

Sincerely,



G. C. Sorensen, Manager  
Regulatory Programs

CVH/kr

cc: W. L. Fitch, EFSEC  
E. Revell, BPA (399)  
N. S. Reynolds, BLCP&R  
T. Tipton, AIF

MAY 23 1985

Acknowledged by card.....  
*PR*



SECRET NUMBER  
ENCLOSURE RULE PR-34, 40, 50 et al  
(50 FR 5600) 117

GA Technologies

GA Technologies Inc.  
PO BOX 85608  
SAN DIEGO CALIFORNIA 92138  
(619) 455-3000

LAW DEPARTMENT

DOCKETED

May 22, 1985

'85 MAY 28 11:43

Secretary of the Commission  
Nuclear Regulatory Commission  
Washington, D.C. 20555

OFFICE OF THE  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Gentlemen:

These comments are in response to the Commission's proposed amendments to 10 CFR Parts 30, 40, 50, 51, 70 and 72, Decommissioning Criteria for Nuclear Facilities, as published in the Federal Register for February 11, 1985. We believe that the proposed rulemaking suffers from several defects.

1. At the bottom of the first column on page 5601 of the Federal Register it is said that "Classes of facilities licensed under Parts 50 and 72 are considered major facilities all of which will require a significant decommissioning effort." It has been NRC's practice to treat Parts 50 and 72 installations as major facilities for purposes of the National Environmental Policy Act. Nevertheless, it is dubious that all classes of facilities licensed under Parts 50 and 72 may categorically be considered major facilities for purposes other than NEPA. Some of them (such as small research reactors) are in fact not likely to demand "significant decommissioning effort". The differences in size, mass, exposure, contamination, and handling ease which prevail between typical large power reactors on the one hand and on the other small research reactors are simply too great to be dismissed by simple statements that they are all major facilities and that they will all equally demand significant effort in their decommissioning.

G.3.1

It seems arbitrary and inappropriate to lump together, as though indistinguishable, a decommissioning cost that will exceed \$100,000,000 for a large commercial facility and

MAY 29 1985

Acknowledged by card... MAY 22 1985 *pd*

10955 JOHN JAY HOPKINS DR SAN DIEGO, CALIFORNIA 92121

May 22, 1985

the cost for a small research reactor's decommissioning, likely to be substantially less than 10% of that. The latter will in many cases be manageable within a licensee's normal financial planning and budgets.

G.3.1

2. In the background discussion of "A. Decommissioning Alternatives", on the same page and elsewhere, there are passages which appear to contemplate that NRC intends to make economic judgments a significant element of the determination, presumably made effectively by NRC, of the acceptability of alternative methods of decommissioning. For example, it is stated that an alternative decommissioning method which delays the date when a license is no longer needed (or as sometimes phrased, when there is "unrestricted release" of a site) would be acceptable in cases where "sufficient" benefit results. We suggest that, provided the licensee observes its statutory and common law obligations to protect the public health and safety, it is improper to import the NEPA concept of cost-benefit balancing into licensing decisions to be made by NRC staff. There are similar indications of this intention in the discussion of "B. Timing", on the same page.
3. We urge NRC to get on with preparing standards for "unrestricted release", and to issue such a rulemaking for comment before adopting rules about financing decommissioning. To appraise the decommissioning burden, a licensee has to know to what degree it must diminish radioactivity or residual materials so as to satisfy NRC that they are at the level below which a license is not required. Ultimately, of course, that is a statutory question, but one concerning which the agency's regulatory standards may be almost conclusive. To deal with financing the decommissioning process and to impose regulations about it before decontamination standards are adopted puts the cart before the horse.

B.3.1.2

E.2

It seems unreasonable to adopt new decommissioning finance regulations without first defining the radioactivity and contamination levels to which a facility must be returned before it is freed of the need for NRC licenses.

4. The proposed regulations make a distinction between private licensees and federal, state or local government licensees, requiring decommissioning plans and financial assurances of the former, but demanding of the governmental licensees only a prediction that some

D.6.4.1.3

May 22, 1985

government entity will guarantee decommissioning funds. (Actually, the word used is "certification" that there will be a guarantee, but it will necessarily be a prediction.) That is troubling. In many instances the nongovernmental licensees will be large, stable, well financed and thoroughly reliable, with assets and income that may exceed those of many of the licensed governmental establishments. If governmental licensees may provide financial assurance through a "certification", it is fair to ask why private organizations must all categorically be denied the same opportunity. Realistically, a "certification" from a government organization may be worth a lot less than a comparable "certification" from a large private organization. To pose only one example, in the federal system itself agencies are forbidden to commit themselves financially beyond currently available appropriations, subject to some exceptions which may or may not obtain in the circumstances adumbrated by Part 50's proposed amendments. The same policy is applicable in various state and local government systems. Notice for example, the implications of California Government Code Sections 11006, 16304 and 13337.5 and Public Contract Code Section 10125. We are told that Rhode Island, for another example, forbids accumulating public funds for contingencies.

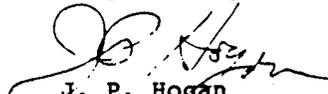
D.6.4.1.3

5. We are unable to discern why NRC assumes in Part 61 that it is proper to accept that a waste form or container can be contrived to be stable for periods of over 300 years, while in the proposed Part 50 amendments apparently judging and denying the acceptability of any entombment method for plant decommissioning unless it will be relied on for less than 100 years. Surely, a reactor designed to withstand seismic assault and other such events can be so entombed as to last as long and provide as much protection for the environment and the population as stable waste forms and containers in shallow land burial. Isn't there an incongruity here which should be reduced?

B.4.3

B.5

Very truly yours,



J. P. Hogan  
Senior Counsel

JPH/lm

DOCKET NUMBER  
PROPOSED RULE PR-30, 40, 50, 51

DUKE POWER COMPANY (50 FR 5600) 70, 72

ELECTRIC CENTER, P.O. Box 33189, CHARLOTTE, N.C. 28242

(118)

(704) 373-5958

R. B. PRIORITY  
VICE PRESIDENT  
DESIGN ENGINEERING

May 9, 1985

DOCKETED

Mr. Samuel J. Chilk  
Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
1717 H. Street  
Washington, DC 20555

'85 MAY 30 AM 1:31

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Mr. Chilk:

Duke Power Company is pleased to submit these additional comments on the proposed rule, "Decommissioning Criteria for Nuclear Facilities," published in the Federal Register on Monday, February 11, 1985. Duke Power has been active in reviewing this issue through its membership in the Utility Decommissioning Group and the Atomic Industrial Forum.

It is the opinion of Duke that new rules are not required to assure that nuclear power plants are safely decommissioned from a technical perspective. The basic premise for the new rule, as outlined in the Regulatory Analysis, is the "lack of uniformity of application, inefficiency on the part of the licensee and NRC in implementation, and finally a lack of timeliness and comprehensiveness that affects proper application of the ALARA principle in carrying out NRC licensing responsibilities" as it relates to present licensees. The current regulations governing operating licenses is a case in point. Additional regulation has not achieved uniformity, efficiency, timeliness or comprehensiveness. Since these plants are either operational or under construction, each should be handled on a case by case basis just as each was handled during the operating license phase.

G.1

The more appropriate way to handle this issue is through revision of Regulatory Guide 1.86 and issuance of additional guidance through a NUREG. It is of utmost importance to assure that activities affecting decommissioning not be allowed to become license conditions. In addition to the obvious problems this causes licensees it is contrary to the conclusion drawn in the regulatory guidance that license conditions can "result in inefficient use of commission and licensee staff time and could result in an inconsistent application of policy."

C.7.2  
D.4.4

From the financial perspective, the Nuclear Regulatory Commission should refrain from rulemaking in areas that are the province of state public utility commissions. Any discussion of decommissioning costs is inappropriate since each station is individual and cannot be adequately addressed by general funding amounts or criteria.

D.8.1  
D.8.3.1  
D.2.1(a)

ACKNOWLEDGED BY CARD JUN 3 1985

PR

Mr. Samuel J. Chilk  
Page 2  
May 13, 1985

Where ever utilities choose to invest funds collected from decommissioning is also outside the domain of the NRC. Attempting to assure fund availability through prepayment, insurance or external sinking funds is not in the best interest of the ratepayer as is evidenced by the Commonwealth of Pennsylvania where licensees are required to externally fund through purchase of bonds of Pennsylvania municipalities or of the Commonwealth. This method has effectively put the responsibility for providing decommissioning funds on the taxpayers. It is unlikely that this process provides as much assurance as does a financially viable utility having a large amount of bondable property at the time of decommissioning.

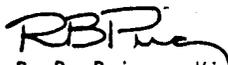
D.8.1  
D.8.3.1

D.3.2.1.1(b)

Again the preferred solution to the problem is through the issuance of a NUREG and Regulatory Guide. This solution will provide the NRC with the assurance it needs while simultaneously providing the utility industry the flexibility it needs.

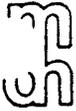
D.8.1

Very truly yours,



R. B. Priory, Vice President  
Design Engineering Department

RBP/pam



minnesota department of health

717 s.e. delaware st. p.o. box 9441 minneapolis 55440  
(612) 623-5000

JACKET NUMBER  
PROPOSED RULE PR-30, 40, 50, 51, et al  
(50 FR 5600) (119)

May 29, 1985

DOCKETED  
CONARC

Secretary, U.S. Nuclear  
Regulatory Commission  
Washington, D.C. 20555

'85 JUN -3 11:55

Attention: Docketing and Service Branch

OFFICE OF REGULATORY  
DOCKETING & SERVICE  
BRANCH

Dear Sir/Madam:

This is in response to your request for comments regarding the "Decommissioning Criteria for Nuclear Facilities" which appeared in the Federal Register Vol. 50, No. 28, February 11, 1985.

1) Part 30.36 (a) (1) (ii):

Removal of contamination to the "extent practicable" does not adequately quantify the extent to which decontamination should be performed. A limit or standard should be delineated (e.g., 100 dpm/100 cm<sup>2</sup>) below which further decontamination is not necessary. Furthermore, the basis for these limits and the health impacts on occupational workers and the public should be assessed.

C.1.16

2) Part 30.36 (c) (2) (i) (A), (B), & (C):

The term "significantly greater" with respect to surface contamination, radiation levels, airborne concentrations and environmental releases needs to be properly quantified for each of these subject areas. Such limits or ranges are necessary to insure uniform clean-up and/or decommissioning activities at all licensees in all States.

C.4.1

3) Part 40.42 (c) (1) (ii):

See Part 30.36 (a) (1) (ii) comments.

C.1.16

4) Part 40.42 (a) (2) (i) (A), (B), & (C):

See Part 30.36 (c) (2) (i) (A), (B), & (C) comments.

C.4.1

5) Part 50.82 (b) (2):

The requirement for a "description of the controls and limits on procedures and equipment to protect...public health and safety" should be expanded to include recommended (or required) limits and controls for residual radioactivity levels, waste management procedures, etc. The assumptions

E.1.1

C.1.3  
C.1.13

an equal opportunity employer

Acknowledged by card JUN 3 1985

pd

Secretary, U.S. Nuclear  
Regulatory Commission

-2-

May 29, 1985

and modeling used to generate these standards should be identified, as should the occupational, environmental, and public health risks associated with the use of these standards. Such information needs to be delineated for each of the decommissioning alternatives.

E.1.1

In addition to the inclusion of these standards into the description requirements, mention should be made of the need to assess the impacts and risks associated with the radioactive wastes generated in the decommissioning process. These impacts and risks should also be addressed for accidents related to decommissioning.

C.1.3.2

C.1.17.2

Thank you for the opportunity to comment on these proposed amendments.

Sincerely,

*Raymond W. Thron*

Raymond W. Thron, Ph.D., P.E., Director  
Division of Environmental Health

RWT/BD/yw



ECOLOGY CENTER OF SOUTHERN CALIFORNIA  
 Project of Educational Communications, Inc.  
 Mailing Address PO Box [redacted] Los Angeles, CA [redacted] 90035  
 35473

Telephone (213) 559-9160

ISSUES NUMBER  
 PROPOSED RULE **PR-30, 40, 50 et al**  
**(50 FR 5600)** **(120)**

May 15, 1985

Secretary of the Commission  
 U.S. Nuclear Regulatory Commission  
 Washington, DC 20555

Atten: Docketing & Service Branch

Re: Decommissioning

The NRC has issued an unacceptable proposed rule for decommissioning reactors. We wish to express our concern that the proposed rule and the questionable use of unsegregated decommissioning funds are, in effect, phantom funds, because they can be used by the utility for financing construction of new plants.

This would seem to go against the intent of protective laws on such issues, and as a consequence, we oppose.

Sincerely,

*Elaine Stansfield*

Elaine Stansfield  
 Associate Director

ES/lm

DOCKETED  
 USNRC

'85 JUN -4 10:41

OFFICE OF SECRETARY  
 DOCKETING & SERVICE  
 BRANCH

D.3.2.11(a)

Acknowledged by card JUN 4 1985

ORDER NUMBER  
ORDER DATE **PR-30,40,50 et al.**  
**(50 FR 5600)** **(121)**

Henry Peck  
534 Bookwalter  
New Carlisle, Ohio, 45344

DOCKET  
USNRC

May 29, 1985

'85 MAY 31 P12:16

OFFICE OF GENERAL  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
Nuclear Regulatory Commission  
Washington, D.C., 20555

Dear Sir:

Although the 13 May deadline for comments is past, I shall do so anyway.  
I respectfully oppose "internal segregated funds" to be used for nuclear power  
plants. Instead, I prefer external segregated funds from my taxes which are not  
controlled by utilities or utility assets. Thank you for your attention.

D.3.2.1.1(a)

Sincerely yours,  
*Henry Peck*  
Henry Peck

JUN 4 1985

Acknowledged by card..... *pd*

*duplicate of # 51*

MARKET NUMBER **PR-30, 40, 50, 51,**  
**PROPOSED RULE (56 FR 5600) 70, 72**

**123**

CONCERNED CITIZENS  
FOR SNEC SAFETY  
c/o James H. Elder  
Wall St Ext  
Saxton, Pa 16678  
May 6, 1985

DOCKETED  
USNRC  
**85 JUN 10 10:19**

Secretary of the Commission  
US Nuclear Regulatory Commission  
Washington, DC 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICES  
BRANCH

Attention: Docketing and Services Branch

Re: Decommissioning Criteria for Nuclear Facilities  
50 Fed. Reg. 5600, February 11, 1985

Concerned Citizens for SNEC Safety is an organization which has been involved in representing local residents as regards the Saxton Nuclear Experimental Corporation's reactor during its dismantlement phase. Therefore we have a very personal stake in the NRC's regulations in this area. We have researched the problems involved in dismantlement carefully so that we can help local residents protect themselves from possible harm.

After studying the proposed rule for decommissioning we have concluded that it contains several serious flaws. It is surprising that a rule which has been worked on since 1977 is so lacking in specifics on the topic it addresses. The rule must be drastically modified to become an adequate framework for the decommissioning process. We will address this problem using the real experience of what has occurred at Saxton, where the plant was partially decommissioned in 1973 and then put into storage for eventual dismantlement.

The decision to change the present requirement for a full Environmental Impact Statement when a final decommissioning plan is developed and to substitute a review is not acceptable. The change in knowledge and techniques during the life of a reactor is considerable and there are certain to be vast differences between the original planning and the actual site-specific situation after 30 or 40 years. This is clearly the case at Saxton only 12 years after its initial decommissioning plan was developed.

In addition, the preparation of a full Environmental Impact Statement is the only guarantee that the site-specific knowledge of local government officials and citizens will be made a part of the plan which is carried out. It is important that the views of those most affected by decommissioning decisions, the local residents and workers, be made a part of the final plans.

The prime consideration in decommissioning decisions must be public health and safety since that is the legal mandate of the NRC. The proposed rule appears to give only lip service to this requirement. It is mentioned, but nowhere are methods or performance goals for achieving safe decommissioning written into the rule. Instead, this topic is left for later action by the

*See  
Comment  
Letter  
No. 51*

JUN 11 1985

Acknowledged by card.....  
*Jp*

NRC. when it should be the real substance of this rule.

One of the most important decisions in decommissioning is whether to use DECON (immediate dismantlement), SAFSTOR (temporary storage with later dismantlement) or ENTOMB (permanent on-site storage). Yet there is no criteria given in the rule for how to make the choice among these options. Even the information supplied with the rule makes a clear case for how to evaluate these options, but the rule itself gives no guidance.

ENTOMB is not a realistic alternative and the rule should state that. There will obviously be special reasons at particular sites to choose the DECON option because of reasons such as poor original siting of a reactor, but in general the evidence suggests that partial decommissioning followed by a 50-year storage period (SAFSTOR) will be the best option in terms of the public health and safety. Radiation exposure to workers and the surrounding area will be lower and, equally as important, there will be a significant reduction in the radioactive wastes produced.

While SAFSTOR might slightly increase the total cost of decommissioning, the public benefits justify that cost. The rule should require that the choice of method be based on a detailed assessment of the effects on public health and safety so that a rational decision can be made. There should be clear criteria available for NRC review of that decision. Again the need for preparation of a full Environmental Impact Statement as part of a final site-specific plan is shown to be justified.

Another extremely important part of the decommissioning process is not addressed by the rule at all. Proper requirements for quality assurance and quality control during decommissioning are essential, including adequate monitoring by the NRC itself. This need is very apparent at Saxton. The original work in 1973 was supposed to have cleaned up several auxiliary buildings for unrestricted use. The AEC did not inspect for 13 months while work progressed. When an inspection finally occurred it was discovered that the buildings remained contaminated. Since the owner (General Public Utilities) had already dispersed its workers, those buildings remain contaminated today. Strict requirements for quality assurance must be a part of the rule.

We cannot understand why the rule specifically excludes from its requirements reactors which have already been permanently shut down. Saxton falls into this category and we think we should receive as much protection as anyone else who lives near a reactor.

The experience at Saxton also casts severe doubt on the adequacy of the proposed rule for estimating the costs of decommissioning. In 1973 GPU estimated that the total decommissioning cost, excluding continued maintenance for SAFSTOR of the plant, would be \$575,000. Even after the initial decontamination work had been done, in 1983 GPU's minimum estimate of the cost for the remaining work was \$12,454,000 or more than 21 times the original total estimate. Obviously not all of this increase was due to inflation. Saxton is only a 35 thermal

See  
Comment  
Letter  
No. 51

megawatt reactor and GPU's cost estimates assume the reactor vessel can be removed in one piece. To think that \$100,000,000 is a maximum figure for decommissioning plants 300 to 400 times the size of Saxton is unrealistic.

The proposed rule should be changed to require a decommissioning fund equal to the best estimate possible for the cost of decommissioning a particular site, and that estimate should be revised every five years so that an appropriate fund can be built up. Otherwise when the time comes to actually decommission a plant only a fraction of the funds required may be available.

The experience of GPU in approaching bankruptcy, with its main assets being inoperable nuclear plants, indicates why the set-aside funding for future decommissioning must be in external sinking funds which are legally separate from a utility's other assets. GPU has not been able to get a blank check from Pennsylvania ratepayers even in its emergency situation and therefore its cleanup at TMI-2 has been delayed. If the funds it had set aside for future decommissioning were part of its normal assets there would be no money available today for work at Saxton. We appreciate the fact that the Pennsylvania Public Utility Commission requires external reserves for decommissioning funds and the NRC should require the same method, along with insurance to provide funding in case of the early retirement of a plant such as happened at TMI-2.

The definition given for the term "decommissioning" is not complete in the proposed rule. Since the objective of decommissioning is to return a site to the same possibilities of use that the site possessed before a reactor was built on it, the definition should include language stating that the limit for residual radioactivity remaining should be the amount of natural background radiation at the site before construction of the plant. This is the only definition which can be acceptable by local residents whose children will be using the site in the future.

To summarize, the proposed rule is not complete since it does not provide specific criteria for making decisions about decommissioning and it leaves out several important topics. The rule should be redrafted and again submitted for public comment before it is accepted by the NRC.

Sincerely,

James H. Elder  
Chairman

See  
Comment  
Letter  
No. 51

DOCKET NUMBER  
PROPOSED RULE **PR-30, 40, 50 et al**  
**(50 FR 5600) (123)**

June 10, 1985



DOCKETED  
USNRC

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Attn: Docketing and Service Branch  
Washington, D. C. 20555

Serial No. 85-160

85 JUN 14 11:19 AM NO/JOH:acm

Docket Nos. 50-280

50-281

50-338

50-339

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Dear Mr. Secretary:

License Nos. DPR-32

DPR-37

NPF-4

NPF-7

VIRGINIA POWER  
COMMENTS ON DECOMMISSIONING  
CRITERIA FOR NUCLEAR FACILITIES  
NOTICE OF PROPOSED RULE MAKING (50FR5600)

Virginia Power is pleased to have the opportunity to comment on the proposed subject rulemaking. We can appreciate the Commission's efforts to address the various issues involved in the decommissioning process, however we feel that the proposed rule is not necessary and recommend that it be withdrawn.

G.1

The NRC issued a rule on September 12, 1984 (49FR35747) eliminating the review of financial qualifications of electric utilities in operating license reviews and hearings for nuclear power plants. This rule was based partly on the fact that electric utilities have the ability "to recover, to a sufficient degree, all or portions of the costs of construction and sufficient costs of safe operation through the ratemaking process. It is well established that public utility commissions (PUCs) are legally bound to set a utility's rates such that all reasonable costs of serving the public are recovered, assuming prudent management of the utility." This argument applies also to decommissioning activities carried on by electric utilities. Decommissioning costs are small compared to construction and operating costs, and the utilities are able to collect them through the ratemaking process without the proposed regulation. Indeed, the proposed NRC rule could have the effect of inducing those public utility commissions that have adopted favorable approaches to the recovery of decommissioning costs to revise those approaches to conform to a relatively less advantageous NRC policy.

D.8.1

D.8.3.1

The proposed rule also seems to be at odds with the Commission policy stated in the 1985 Policy and Planning Guidance (PPPG). The PPPG indicates the Commission's intent to have less prescriptive regulations, and to see that new requirements imposed on the regulated industry have a "positive contribution to the public health and safety," while "existing

G.1

Acknowledged by card JUN 18 1985 *pd*

regulatory requirements should be reviewed to see if some could be eliminated without compromising safety." The safety of decommissioning activities is already ensured by other regulations, and will not be enhanced or affected in any manner by the proposed new rule.

Therefore, we recommend that the proposed regulation be withdrawn on the basis that it is not necessary, it does not enhance public health and safety, and does not comply with current Commission policy towards simpler and less prescriptive regulations.

Nevertheless, if the Commission continues to favor issuance of the proposed rule, we recommend that it be revised to take into account the following comments:

- 1) The rule should clarify the means by which changes and updates in the decommissioning funding plans are to be made. It should explicitly state that the plans are not part of the licenses and that changes and updates will not constitute license amendments.
- 2) The rule should make clear that utilities should collect funds towards total decommissioning of the facilities, not just decontamination of the nuclear parts.
- 3) The figure of \$100,000,000 should be deleted because it can be misinterpreted as indicating a minimum or maximum cost of decommissioning. The cost of decommissioning is very plant specific, and there is no basis to believe that the \$100 million figure is representative for a number of plants.
- 4) The rule should be modified to require submission of the decommissioning funding plans two years after issuance of the necessary regulatory guides and other regulatory guidance, rather than two years after the effective date of the rule.
- 5) The proposed rule would require that the estimated cost of decommissioning, in 1984 dollars, be adjusted annually for inflation at a rate twice the change in the Consumers Price Index (CPI). We acknowledge that the CPI is intended to represent a measure of inflation by approximating the cost-of-living index, but that it would prove inadequate for an endeavor such as decommissioning. As such, we recommend that the utilities be allowed to make their best estimate of the increase of the decommissioning costs based on changes in the physical facilities and changes in the costs associated with the different activities associated with the

G.1

D.4.3

D.4.4

D.4.2.1

D.2.1(a)

D.4.1.1

D.2.1(a)

D.2.1(b)

decommissioning plan. These factors, when evaluated in conjunction with appropriate indicators of economic change, would provide more comprehensive criteria for price adjustments than simply using twice the CPI.

D.2.1(a)  
D.2.1(b)

- 6) The rule should state explicitly that it is not intended to supplant any state public utility commission rule or policy concerning the recovery of decommissioning costs or the maintenance of a decommissioning reserve that provides equal or greater assurances that the utilities subject to that commission's jurisdiction will be financially capable of meeting all of the financial requirements for decommissioning activities.
- 7) Recognize that decommissioning of nuclear facilities is different from other industrial plants because there are disposal costs that are not retrievable from the sale of scrap material. In this regard the collection of funds from the customers using electricity from a nuclear power plant to be decommissioned is valid.
- 8) The rulemaking should distinguish between the ability of diversified utilities and single asset (nuclear) utilities to provide financial assurance of their ability to decommission nuclear facilities.
- 9) The mention of generic studies such as the PNL study should be removed from the rule in keeping with the remarks in item 8. This study is outdated in respect to costs and could mislead the PUCs in rate-making processes if applied to individual cases.
- 10) The rulemaking should not require the approval of a decommissioning plan prior to the commencement of actual decommissioning work, if such work is within the limits of the license or violates no other rules. Some work could begin almost immediately after the termination of operation when the optimum work force is available.
- 11) There is a need to examine the criteria for decommissioning and its relationship to the criteria for site residual radioactivity limits. It would be more appropriate if these criteria were broadened to encompass alternate modes of decommissioning which could be established to fit the normal financial and tax structure of the utility industry. The rule should also distinguish the nonradioactive portion of a facility from the radioactive portion. In this regard it is almost certain that the majority of utilities

D.8.3.1

D.3.3.2

D.2.1(a)

C.1.5

B.1.2.1

will not relinquish present sites to the use of the general public but will continue to find functional use of the sites. Conflicts in the rulemaking could also occur where there is more than one unit and they do not have licenses that expire simultaneously.

B.1.2.1

B.4.2

12) It appears that the specificity of the recordkeeping requirements in the proposed rule is not necessary for regulation.

C.7.1

13) Spent fuel storage facilities and other storage facilities are licensed under Part 72 whereas power stations are licensed under Part 50. The rule should be specific as to what is addressed. Part 72 installations for fuel storage should require only superficial decommissioning, if any, after the fuel is gone.

B.1.2.2

If the proposed rule is adopted we would endorse, in particular, the following features:

D.3.2.1.1(b)

1) Inclusion in the proposed rule of internal reserves as an option where utilities can place their decommissioning funds. We urge that this option be maintained.

2) A distinction between the routine decommissioning of facilities at the end of their normal lifetime and a forced decommissioning following an accident.

G.11

3) The exclusion of decommission funding plans from the NEPA process. This should be emphasized in the final rule.

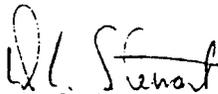
F.1

4) The recognition that both entombment (ENTOMB) and intermediate storage (SAFSTOR) are viable options before the commencement of decommissioning the radioactive portions of the facility.

B.5

In addition, Virginia Power supports the detailed comments submitted by the Utility Decommissioning Group (Bishop, Liberman, Cook, Purcell and Reynolds) and by the Atomic Industrial Forum Subcommittee on Decommissioning.

Very truly yours,

  
W. L. Stewart

cc: Mr. William J. L. Kennedy  
Chairman, AIF Committee on Environment  
Atomic Industrial Forum

Medicine  
Health Physics  
Industrial Hygiene  
Toxicology  
Medical Department/3M

DOCKET NUMBER  
PROPOSED RULE **PR-30, 40, 50 et al**  
**(50 FR 5700)** **(124)**

3M Center  
St. Paul, Minnesota 55144  
612/733 1110

**3M**

June 13, 1985

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

DOCKETED  
USNRC

Attention: Docketing and Service Branch

'85 JUN 18 AIO:51

Gentlemen:

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

The following comments are submitted in response to the proposed rule on Decommissioning Criteria for Nuclear Facilities as published in the Federal Register, Volume 50, No. 28, Monday, February 11, 1985. In particular the comments address Section D., Financial Assurance.

In the proposed rule three methods of financial assurance are suggested for Part 30 and Part 40 licensees; (1) prepayment, (2) surety method or insurance, and (3) an external sinking fund coupled with a surety method. We believe that for Part 30 and Part 40 licensees a fourth method, based on a financial test, would also be appropriate. This test could be similar to the one used by the Environmental Protection Agency (EPA) for financial assurance for closure and post-closure care as specified in Subpart H of 40 CFR Parts 264 and 265.

The financial test specified in the EPA regulations relates the estimated cost of closure and post-closure care to various assets or financial ratings of the facility owner or operator. Included in the test are such things as the tangible net worth of the organization, the amount of assets in the United States, the ratings of the most recent bond issuance, net working capital, and ratio of assets to liabilities. Two alternatives are offered in the regulations to satisfy the financial assurance requirements. (Refer to Federal Register Volume 47, No. 67, Wednesday, April 7, 1982, page 15034).

D.6.4.1.1

It appears that the financial test promulgated by the EPA for closure and post-closure care could be applied by the NRC for decommissioning of Part 30 and Part 40 licensees. 3M recommends its addition to the proposed rule.

Sincerely,



Robert G. Wissink  
Chairman, Isotope Committee

RGW:lmo

JUN 18 1985

Acknowledged by card. ....  
*pu*

J-483



HOUSE NUMBER  
PROPOSED RULE PR-3040, 50 et al.  
(50 FR 5600) (125)

State of Maine  
Senate Chamber

Augusta, Maine 04333

June 14, 1985

BUCKETED  
USNRC

'85 JUN 20 P2:51

Nunzio Palladino, Chairman  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

OFFICE OF PUBLIC  
AFFAIRS

Dear Chairman Palladino:

We are pleased that the Commission is proposing regulations on nuclear decommissioning. However, this does raise one broad concern: possible pre-emption of state laws on that subject.

6.1

The State of Maine enacted the Nuclear Decommissioning Financing Act (35 MRSA §§3351-3376) in 1982 in order to ensure that the necessary funds will be available when our nuclear powerplant is decommissioned. We strongly support minimum federal standards, but would object strongly to pre-emption of more stringent state laws.

D.8.3.1

Therefore we recommend that the regulations include a specific statement that "any state may adopt and enforce decommissioning financing requirements which are more stringent than requirements of federal law."

Enclosed for your information is a copy of the applicable portion of Maine's law. We also have supplied these to Paul Lohaus, State Coordinator for Region I.

Thank you for your attention.

Sincerely,

*Judy C. Kany*  
Sen. Judy C. Kany  
Chair, Low-level Radio-  
active Waste Siting  
Commission

cc: Paul Lohaus, Region I

2401

JUN 20 1985

Acknowledged by card... *pd*

Atomic Industrial Forum, Inc.  
7101 Wisconsin Avenue  
Bethesda, MD 20814-4805  
Telephone: 301-654-3250  
TWX 7108249602 ATOMIC FOR DC

DOCKET NUMBER **PR-30,40,50 et al**  
REGULATORY RULE **(50 FR 5600) 126**

DOCKETED  
USNPC

National  
Environmental  
Studies  
Project

June 20, 1985

'85 JUN 21 AIO:42

Mr. Samuel J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
1717 H Street  
Washington, D.C. 20555

OFFICE OF SECURITY  
DOCKETING & SERVICES  
BRANCH

Dear Mr. Chilk:

The Atomic Industrial Forum's Subcommittee on Decommissioning is pleased to submit comments on the proposed rule, "Decommissioning Criteria for Nuclear Facilities", published in the Federal Register on Monday, February 11, 1985. Our Subcommittee has been active in reviewing this issue since the Advance Notice of Proposed Rulemaking was issued in 1978, including most recently a presentation of its views to the Commission on September 20, 1984.

In general, the Subcommittee finds that the proposed rule offers many positive features that will be of assistance in the overall planning and implementation of acceptable decommissioning projects during the coming years; however, as discussed in earlier comments, it is believed that present NRC regulations in the technical area are adequate to protect public health and safety. A number of key issues of previous concern to the Subcommittee have been adequately addressed in the proposed rule. For example, the proposed policy on the use of the internal funding mechanism for utilities will make it possible for the most effective funding mechanism to be utilized while at the same time providing reasonable assurance of funds at the time of decommissioning. In addition, the NEPA process has been addressed by the Commission in a manner which will minimize regulatory requirements not germane to the prime issue of protection of public health and safety.

G.1

D.3.2.1.1(b)

F.1

Our principal comments on the proposed rule are both technical and financial in nature. In the Subcommittee's judgement, further improvement could be achieved if the rule could be focused on the need for site-specific, realistic decommissioning cost estimates rather than the specification of sums that may not be realistic for present-day typical nuclear power plants. Use of site-specific decommissioning studies would provide more accurate information for state regulatory bodies who would then not have to depend on generic studies for use in the rate-setting process. Also, the rule seems to discourage consideration of the entombment option for nuclear power plants at a point in time when foreclosure of possible decommissioning options is not technically justified. All options should be left open so that needed decommissioning research can proceed.

D.2.1(a)

B.5

Acknowledged by card JUN 21 1985

Mr. Samuel J. Chilk

-2-

June 20, 1985

The proposed rule includes in Section 50.54 provisions related to decommissioning funding as conditions of license. The Subcommittee views this issue as non-safety related and recommends removing funding aspects from this section of the rule which would assist in removing possible uncertainties associated with the operating license and avoid unnecessary procedural requirements.

D.4.4

The proposed rule does not include a provision for residual radioactivity limits which is being handled separately as an amendment to 10CFR Part 20. The NRC is encouraged to proceed with the development of this limit which is needed in the decommissioning planning process. If it would expedite the rulemaking process, the NRC may wish to consider separating the issue of a site residual radioactivity limit from other overall radiological limits that may be involved in decommissioning.

E.1.1

The Subcommittee would be pleased to discuss these comments with the staff.

Sincerely,



William J.L. Kennedy  
Chairman  
AIF Committee on Environment

WJK:hbb  
Attachment

COMMENTS ON PROPOSED NRC RULE,  
DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES,  
PREPARED BY AIF SUBCOMMITTEE ON DECOMMISSIONING

June 20, 1985

The AIF Subcommittee on Decommissioning has reviewed the proposed rule, Decommissioning Criteria for Nuclear Facilities, published in the Federal Register of Monday, February 11, 1985. The Subcommittee believes that the proposed rule contains many features which will contribute to the overall regulation of nuclear power plants. Over the period of time since the AIF commented on the original Advance Notice of Proposed Rulemaking in 1978, the NRC staff has incorporated many beneficial features into the development of this proposed rule.

G.1

The Subcommittee offers the following comments for consideration by the NRC in writing the final rule. These recommendations, in the judgement of the Subcommittee, would result in a more efficient regulatory process relating to decommissioning and provide adequate health and safety protection for the public. The proposed rule has approached the decommissioning funding issue in a realistic manner by correctly concluding that internal reserve is an appropriate method for funding decommissioning. In addition, the proposed rule makes it clear that no additional environmental review requirements will be imposed with the new decommissioning regulations and categorically excludes decommissioning funding plans from the NEPA process. The Subcommittee believes this to be an appropriate way of addressing the NEPA issue and favors its inclusion in the final rule.

D.3.2.1.1(b)

F.1

The Subcommittee has identified the following comments which, in its judgement, would improve the proposed rule:

1. The proposed rule requires that Part 50 licensees submit either a site-specific decommissioning funding plan or a certification that financial assurance for decommissioning be provided in an amount at least equal to \$100,000,000 (1984 dollars) adjusted annually for inflation. The NRC's objective for including this type of provision in the rule is to assure that adequate funds are available for decommissioning a nuclear facility at the end of its useful lifetime. The industry also shares this objective of assuring the availability of decommissioning funds when needed.

D.2.1(a)

The AIF Subcommittee believes that the preferred approach is to base the decommissioning cost estimate on a site-specific study, rather than to include a specified minimum or generic amount that the Commission has described as "sufficient" to cover decommissioning costs for "most"

power reactor licensees as described in the Supplemental Information (page 5606, Column 3) . One of the major problems facing a utility is the need to assure that electric rate regulators use decommissioning cost estimates that are both adequate and realistic for the plant in question in establishing the rates for collecting these funds. Experience has shown that rate regulators often rely heavily on NRC-sanctioned generic cost estimates. The availability of site-specific decommissioning cost estimates to state rate-regulatory bodies would provide them with more accurate information and avoid the necessity for their having to depend on generic studies in the rate process.

D.2.1(a)

In this connection, it is the Subcommittee's judgement that the \$100 million identified in the proposed rule is not representative of the decommissioning costs for most of today's nuclear power plants. Current experience with site-specific studies of large-scale nuclear power plants have shown the costs to be substantially higher. Therefore, the rule should encourage the use of site-specific studies in lieu of a generic certification amount.

D.1.1.1

If the Commission should find it necessary to specify actual fund amounts in the rule, the specified amount should be sufficiently high so that it is adequate to include realistic decommissioning costs. It is appropriate that specified amounts be higher than current site-specific cost estimates since the generic certification provision of the proposed rule is intended to reflect a conservative upper bound estimate. Adopting an inadequate amount in the rule may be misleading in rate proceedings and could be counter-productive to NRC's objective of financial assurance. In addition, the NRC should specify clearly in the rule what this certified amount is to include, such as contingencies, etc. so there will be no misunderstanding as to its intended scope. Also, the NRC should consider means for adjusting the specified amount based on plant size, design, and other site-specific factors.

D.2.1(b)

2. The Supplementary Information under the "Preliminary Planning" section (page 5604, Column 3) suggests that the Battelle Pacific Northwest Laboratory (PNL) decommissioning studies can be used for initial cost estimates with suitable adjustments for inflation and for site-specific factors. Past experience with the PNL studies, which yield insufficient cost estimates, have resulted in rate regulators using the lowest available cost estimates. Therefore, the Subcommittee urges that the sentence referring to this use of the studies be deleted since they are outdated in the cost area. The use of generic studies to project realistic decommissioning cost estimates has inherent problems and should generally be discouraged in favor of site-specific studies.

D.2.1(a)

3. A major objective should be to achieve consistent estimates among various plants that reflect realistic decommissioning costs. To this end, AIF's National Environmental Studies Project currently is supporting a study to develop decommissioning cost estimate guidelines. In order to assure the maximum degree of acceptance, this study is being conducted with the cooperation of NRC staff, National Association of Regulatory Utility Commissioners (NARUC) as well as representatives of the nuclear industry. This project will be completed during the summer of 1985. Because of the technical input from the various organizations having an interest in this subject, the NRC and others should find that the final report represents a suitable method for utilities to use in developing realistic site-specific cost estimates to meet NRC and State requirements. Use of these guidelines would support NRC's and the industry's objective of adequate decommissioning cost estimates for funding purposes and be beneficial in implementing the new decommissioning rule.
4. The proposed inflation rate also puts an unnecessary barrier in front of the utility similar to the \$100 million certification level. It effectively puts a ceiling on future decommissioning increases if these increases are greater than twice the Consumer Price Index (CPI). In the judgement of the Subcommittee, there has not been a strong relationship between the CPI and the increase in decommissioning cost estimates over the past few years. To the extent that revised estimates for decommissioning a plant are to be conducted every several years for purposes of rate justification, the actual inflation rate, whether upward or downward, will, in fact, be built in.
5. The Subcommittee recommends that the proposed regulations be written (section 50.54) to remove the funding aspects of decommissioning as conditions of license. Funding aspects have no direct impact on safety and removing these provisions as license conditions would alleviate possible uncertainties associated with the operating license, as well as avoid unnecessary procedural requirements.

In a related area, the proposed rule does not make provisions for the case of pending applications for operating licenses. Proposed 10CFR 50.33 (k)(1) provides that each application for an operating license submitted by an electric utility must contain information providing reasonable assurance that funds will be available to decommission the facility. Unlike proposed 10CFR 50.54 (cc)(1) and (2), 10CFR 50.33 (k)(1) contains no provision for delayed effectiveness. Consequently, unless the proposed rule is modified, applications for operating licenses still pending when the rule becomes effective will have to be amended. More important, the potential for the

D.2.1(a)

D2.1(a)  
D2.1(b)

D.4.4

D.4.1.2

introduction of new contentions - and therefore for delay - in operating license hearings would be substantial. It would appear that a solution to this potential problem would be to insert the following language (underscored) in 10CFR 50.33 (k)(1): "For an application for an operating license for a production or utilization facility, filed on or after (insert the effective date of the final rule)....."

D.4.1.2

6. The Supplementary Information preceding the proposed rule implies that entombment may be precluded as a viable decommissioning mode (page 5603, Column 3); the proposed rule itself does not make reference to this aspect. Because of the potential advantages through reduced occupational radiation exposures, reduced waste volumes generated, and the time available for making final decisions on decommissioning, the Subcommittee believes that no potential options for the future should be foreclosed, either through a rule or by implication at this time. Therefore, the Subcommittee urges that the wording in the Supplementary Information clearly indicate that entombment may, in fact, be a possible option for decommissioning in the future under certain circumstances. It is inappropriate at this time to specifically preclude any decommissioning alternative in a rulemaking, since decommissioning is a developing technology. Such a restriction would discourage research into alternative methods which could reduce costs and/or radiation exposure associated with decommissioning.

B.5

With reference to ENTOMB, cost considerations should be the province of the license holder. A statement on the efficiency of a decommissioning option based on an evaluation of cost at this time should not be included in the Supplementary Information.

The basis for the 100 year period during which radionuclides would decay to levels permissible for unrestricted use for the ENTOMB option, does not appear to be completely consistent with other NRC regulations. In 10CFR61 and the associated background information published in the Federal Register notice of final rulemaking (Vol. 47, No. 248, Monday, December 27, 1982, pp 57446-57482), credit is taken for stability of waste form (either solidification or disposal in high integrity containers) for periods of over 300 years. ENTOMB options could be at least as effective in providing waste form stability as the disposal of stable waste forms in shallow land burial facilities.

B.4.3

B.5

Without making specific reference to individual isotopes, it would be more appropriate to have a generic requirement that isotopes be characterized as to plant-specific measurements or records. Based on this information, decommissioning mode and timing could be selected.

B.3.1.1

7. There is a need for NRC to develop suitable residual radioactivity limits as an important step in determining overall decommissioning policy. The staff has such limits under development at the present time. We understand that there is some ongoing discussion involving the ACRS relative to the technical merits of a single limit that would apply to many facets of decommissioning, including the site limit and recycled materials. Because of the importance of having site limits for use in planning, the Subcommittee suggests that the residual radioactivity issue be phased so that site limits could be developed apart from other related aspects of this topic since they have an important relationship to the costs of decommissioning.
8. Paragraph 50.82 (2)(e) of the proposed rule and the Supplementary Information (page 5605, Column 2) state that Commission approval is required prior to the initiation of any decommissioning activity by the licensee. There are numerous procedures that can and should be accomplished after cessation of plant operation, including the dismantlement of certain systems. This provision would effectively prohibit activities that are presently permitted by the technical specifications under Section 50.59. The Subcommittee recommends that the wording of paragraph 50.82 (2)(e) be modified to permit certain operations that would eventually be included in an overall decommissioning plan.
9. The definition of "decommission" contained in the proposed rule is somewhat restrictive compared with the usage normally applied to decommissioning; i.e. the process for getting to the end point which is termination of the license. The Subcommittee recommends that the definition be carefully worded so that it is clear that it is the process being addressed by the term "decommission". The actual end point of termination of license with unrestricted use of the property could be termed "decontamination and termination of license". Also the definition should clarify that decommissioning for purposes of the rule does not apply to non-radioactive portions of the facility.
10. The specificity of recordkeeping requirements for just decommissioning does not appear necessary for regulatory purposes. Recordkeeping is a normal process in the construction and operation of nuclear power plants. Standard recordkeeping procedures should include those records important to decommissioning.
11. The Supplementary Information should be revised to grant publicly owned power reactors, not subject to regulation by a state utility commission, the same treatment as other publicly owned facilities. Section 40.36(d)(4) of the proposed rule provides that in the case of federal, state

E.1.1

C.1.5

B.1.1.2

B.1.2.1

C.7.1

D.3.2.3

or local licensees, assurance of funds can be satisfied through a certification that the appropriate government entity is guarantor of decommissioning funds. This should also be added to Part 50.

D.3.2.3

12. (a) The proposed rule applies also to facilities licensed under Part 72. The Commission intends to license the Department of Energy's Monitored Retrievable Storage facility under that Part. The considerations which primarily motivate the proposed rule, particularly cost and funding concerns, clearly do not apply to a federal agency. Decommissioning of the Monitored Retrievable Storage facility will, on the other hand, be guided by considerations quite unrelated to other licensed facilities. For those reasons we recommend that the funding aspect of the proposed rule specifically be waived for NRC-licensed federal facilities. Compliance with future Commission regulations with respect to residual radiation levels may be made a condition of the MRS license.

D.7

(b) Due to the probable overlap of some Part 50 and Part 72 installations at the same site and the probable differences in license expiration dates, attention should be paid to this potentially conflicting situation in the rule. One license may expire at a site while another is still active, and the desirable decommissioning approach may be to await completion of all site "operations." In these cases, definition of when the final decommissioning plans must be submitted based on "permanent cessation of operations" may need to be modified.

B.4.2

C.1.2.2

(c) NRC has previously stated with regard to 10CFR Part 72 that (1) Part 72 storage facilities and Part 50 plants are very different in nature, (2) storage of spent fuel is a low risk operation, and (3) the conditions that could lead to release and dispersal of significant quantities of radioactive materials are not present at a storage facility as at an operating nuclear plant. However, the preamble to the proposed rule seems to lose this distinction and should be revised accordingly to reflect the potentially different requirements for decommissioning between Part 50 and Part 72 installations. Part 72 is not a facility license and may not require a significant decommissioning effort due to the nature of some storage options. It is intended to be a one-step licensing process, and, therefore, should not be assumed to be similar to Part 50 in terms of decommissioning.

G.3.2

- (d) Since Part 72 is defined as a one-step licensing process, detailed explanation of how this proposed two-phase decommissioning review is to be incorporated procedurally into Part 72 needs to be added. Licensing confusion may otherwise develop.

G.3.2



Northern States Power Company

414 Nicollet Mall  
Minneapolis, Minnesota 55401  
Telephone (612) 330-5774

Harry W. Spell  
Senior Vice President  
Finance

July 3, 1985

ADVISORY NUMBER  
PROPOSED RULE PR 34.41 50 et al  
(50 FR 5600) (127)

DOCKETED  
USNPC

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

'85 JUL -8 A1:08

Re: Decommissioning Criteria for Nuclear Facilities

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Northern States Power Company (NSP) submits these comments in response to the Nuclear Regulatory Commission's proposed regulations regarding the decommissioning criteria for nuclear facilities published in the Federal Register on February 11, 1985.

NSP is an operating public utility engaged in the generation, transmission and distribution of electricity in Minnesota, North Dakota, South Dakota, Wisconsin and Michigan and the distribution of gas in Minnesota, North Dakota, Wisconsin and Michigan. NSP owns and operates three nuclear generating units. The Company's earliest facility is a 536 megawatt unit at Monticello, Minnesota, which was placed in service on June 30, 1971. The Company's remaining facilities include a 503 and 500 megawatt unit at Red Wing, Minnesota. These units were placed in service on December 16, 1973, and December 24, 1974, respectively.

The Company's first comment relates to the use of the \$100 million inflation adjusted figure as a proxy for estimated decommissioning costs. This amount may be appropriate for an interim time period between the date when financial assistance is required and the first date when a site specific decommissioning cost estimate could be produced. To protect both utilities and their ratepayers, financial assurance for decommissioning should be based upon the best site specific engineering estimates of the expected decommissioning costs. Accordingly, it is the Company's recommendation that the Commission require that financial assurance for decommissioning be based upon periodic engineering estimates of site specific decommissioning costs. A reasonable time interval for periodic updates of such an engineering study would be every five years.

D.2.1(a)  
D.2.1(b)

D.4.3

The Company's second comment relates to the alternatives available for financial assurance. NSP uses an internal reserve sinking fund to recover future decommissioning costs.

D.3.2.1.1(b)

Acknowledged by card JUL - 8 1985

Secretary of the Commission  
July 3, 1985  
Page Two

NSP believes this method is both cost effective and provides reasonable assurance of the availability of funds for decommissioning at the termination of the plant's operation. The Commission is to be commended for continuing to include this method as an acceptable alternative for electric utilities.

D.3.2.1.1(b)

Questions regarding these comments may be addressed to Lee Carlson at (612) 330-5567.

Respectfully submitted,



HARRY W. SPELL  
Senior Vice President  
Finance

HWS/DMS/ccj

JULIES NUMBER  
PROPOSED RULE PR-30, 40, 50 et al (128)  
(50 FR 5600)

**AMERICAN ELECTRIC POWER Service Corporation**



1 Riverside Plaza (614) 223-1000  
P.O. Box 16631  
Columbus, Ohio 43216-6631

A. JOSEPH ODWO  
SENIOR VICE PRESIDENT AND GENERAL COUNSEL  
  
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VICE PRESIDENT, SECRETARY AND DEPUTY GENERAL COUNSEL  
  
JOHN F. LORENZO JR.  
VICE PRESIDENT AND ASSOCIATE GENERAL COUNSEL  
  
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ASSISTANT VICE PRESIDENT GOVERNMENTAL AFFAIRS  
  
JOHN B. SHINNOCK  
WILLIAM C. HARVEY  
JEFFREY P. WHITE  
ASSISTANT GENERAL COUNSEL  
  
WILLIAM DAVIS KELLY  
TAX COUNSEL  
  
DANIEL W. O'BRYAN  
ASSISTANT TAX COUNSEL

Writer's Direct Dial No.

614/223-1622

July 5, 1985

ROBERT W. HARMON  
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ANTHONY E. MILLER  
KATHRYN L. NEUMAN  
KEVIN D. MACK  
JEFFREY D. CROSS  
BRADFORD R. SIGNET  
ATTORNEYS

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
Attention: Docketing and Service Branch

Re: Decommissioning Criteria for Nuclear Facilities,  
50 Fed. Reg. 5600, February 11, 1985

Gentlemen:

Indiana & Michigan Electric Company (IMECo) wishes to amend the comments submitted on May 13 on its behalf in this rulemaking. IMECo understands that the period for filing comments has been extended to July 12, 1985. This amendment amplifies our discussion of funding methods, and we ask that you substitute this letter for the May 13 submission.

IMECo owns and operates the Donald C. Cook Nuclear Plant, which has two nuclear units with a combined rating of 2,130 megawatts. IMECo shares the Commission's concern about assuring that the decommissioning will be accomplished in a safe and timely manner and that adequate licensee funds will be available for this purpose. The following comments are made in the interest of strengthening and/or clarifying the proposed amendments:

1. Decommissioning Funds

- a. We have no basis for disagreeing with the \$100 million except that it would be helpful to add detail supporting the reasonableness of this as a

G.1

D.2.1(b)

Acknowledged by card JUL 13 1985  
pk

generic estimate of actual decommissioning costs. In lieu of generic standards, IMECO has presented testimony before certain regulatory commissions as to its preferred method of decommissioning and estimated cost. The Commission's rule should clearly state that if a licensee site-specific cost estimate for decommissioning is available, it should be used in lieu of the \$100 million figure. We also recommend clarifying whether the \$100 million is per unit or per plant (which may have more than one unit). If per unit, then some consideration should be given to requiring less than \$100 million per unit at a plant having more than one unit on the assumption that the units will be decommissioned in the same time frame, resulting in a more efficient, less costly program.

D.2.1(b)

- b. We are concerned with what we perceive to be a problem in timing. In order to obtain NRC approval of a funding plan, it is assumed that a utility must select the decommissioning method. Otherwise, it will not be possible to estimate costs for the plan. Yet, the Commission's guidance on critical issues such as timing and acceptable levels of residual radioactivity for release of property for unrestricted use will not be available until some later, unspecified date. Accordingly, the two-year period during which a plan is to be prepared may not be long enough. We urge the Commission to issue as soon as possible all of the technical criteria by which a decommissioning funding plan will be judged.

B.3.1.1  
D.2.1(c)  
E.1.1

D.4.1.1

D.2.1(c)

2. Funding Methods

We think that of the four methods proposed, the external sinking fund and internal reserve will receive the most attention. We favor the external fund because of the assurance of its continued availability for the purpose of decommissioning. Also, due to the absence of an established funding source during the decommissioning period the internal reserve can be risky from an assurance viewpoint particularly for an essentially single-asset company. Generally, it should be limited to those cases where the liability is small in relation to the company and the company has a strong financial position. However, we also agree with the Commission's statement (see second column, page 5609) that it is

D.3.2.1.1(a)

D.3.4

D.3.2.1.2

D.8.3.1

Secretary of the Commission  
July 5, 1985  
Page 3.

neither necessary nor desirable for the Commission to require a specific financing method for collecting decommissioning funds. Instead, the choice between the internal and external funding methods should be made by the state and federal ratemaking bodies.

D.8.3.1

3. Existing Licenses

a. The section on Existing Licenses at page 5608 highlights the need, as noted in our earlier comment, for the Commission to identify very soon the criteria for approving funding plans. Included in this section is an apparent criterion which says the period of time for building to the acceptable funding level is 5 years or one-third of the remaining license period, whichever is greater. This criterion, however, is not stated in the proposed amendment. Is it a condition of approval of a plan?

D.2.1(c)

b. The following questions should be answered:

D.4.6.1

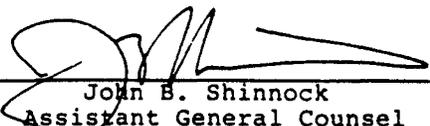
1. Does the "catch-up" requirement apply to electric utilities? The text (see line 19, third column, page 5608) implies that the presence of the Section 50.54(w) insurance for electric utilities eliminates the need for the catch-up.
2. What is an "adequate decommissioning fund"? The projected costs of decommissioning or the level that would have been attained if funds had been accumulated from the beginning of facility life?

We appreciate the opportunity to provide comments on the proposed amendments.

Respectfully submitted,

Indiana & Michigan Electric Company

By

  
John B. Shinnock  
Assistant General Counsel  
American Electric Power  
Service Corporation

JBS/lb



DOCKET NUMBER **PR-30,40,50 et al**  
PROPOSED RULE **(50 FR 5600)** **(129)**

**NEIL F. HARTIGAN**  
ATTORNEY GENERAL  
STATE OF ILLINOIS

DOCKETED  
55470

'85 JUL 12 AM 10

July 11, 1985

DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn: Docketing and Service Branch

Re: Decommissioning Criteria for Nuclear Facilities  
50 Fed. Reg. 5600 (1985).

Dear Secretary of the Commission:

Enclosed is one copy of the Comments of the People of the  
State of Illinois with attachments to be filed in the above cap-  
tioned rulemaking.

Sincerely,

John W. McCaffrey  
Chief, Public Utilities Division

JWMc:gp

Enclosures

Public Utilities Division  
100 West Randolph Street  
12th Floor  
Chicago, Illinois 60601  
(312) 917-5119

JUL 13 1985

Acknowledged by card.....

UNITED STATES NUCLEAR REGULATORY COMMISSION

PROPOSED RULE )  
 )  
DECOMMISSIONING CRITERIA )  
FOR )  
NUCLEAR FACILITIES )

'85 JUL 12 A11-10

DOCKET NO. 85-1000  
BRANCH

COMMENTS OF THE  
PEOPLE OF THE STATE OF ILLINOIS

The People of the State of Illinois by and through their Attorney, NEIL F. HARTIGAN, Illinois Attorney General, file these comments concerning the Nuclear Regulatory Commission's ("NRC's") proposed rule of Decommissioning Criteria for Nuclear Facilities, 50 Fed. Reg. 5600 (1985).

INTRODUCTION

The People of the State of Illinois ("People of Illinois") are limiting their comments on this proposed rule to the funding assurance requirements for nuclear power electric generating facility licensees and to the environmental review proposed for nuclear facility licensees. The reason for not commenting on other issues, such as the lack of standards for the final radiologic survey, is not because the People of Illinois find those issues unimportant. Rather, these comments focus on the financial funding and environmental review issues because of their pre-eminent importance in this particular rule-making. The NRC has identified the funding assurance issue and the establishment of a prescribed amount for the level of assurance as issues that have proved particularly difficult to resolve. 50 Fed. Reg. 5603 (1985). The People of Illinois agree that these issues are important and that a prompt resolution is in the public interest. These comments support the

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NRC's proposals with respect to funding assurance requirements with certain suggestions for modifications that will enhance the impact of the rules on funding assurance for decommissioning nuclear power electric generating facilities. With respect to the environmental review requirements, these comments urge the NRC to retain its present regulations and not reduce the level of environmental review at the time of decommissioning.

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#### RECOMMENDATIONS

With respect to funding assurance, the People of Illinois are making four recommendations, three of which suggest modification to the proposed rules. First, the People of Illinois endorse the requirement in the proposed Part 50.82(c) that any decommissioning plan which anticipates a period of temporary storage must be funded by a prepaid external fund. Second, the People of Illinois suggest that the external fund requirement be extended to any decommissioning plan that anticipates immediate disassembly that will take longer than one (1) year to complete. Third, the People of Illinois suggest a modification to the option, provided in the proposed Part 50.33(k)(1), of allowing a certificate of assurance of funds equivalent to \$100,000,000 in the 1984 dollars. That option should be allowed only if the applicant demonstrates that, from the best evidence available, the actual decommissioning expense will be less than \$100,000,000 in 1984 dollars. Finally, the People of Illinois suggest modifying the proposed part 50.33(k)(4)(iv). Specifically, the use of an internal fund should be allowed only after the applicant has failed to obtain the agreement of a government agency to act as trustee of an external fund and there is no external fund otherwise available which generates non-taxable income.

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D. 3.2.1.2

With respect to environmental review, the People of Illinois maintain that the National Environmental Policy Act ("NEPA") (42 U.S.C. sec. 4321 et seq.) and considerations of sound environmental policy require that site specific environmental impact statements be conducted at the time that detailed decommissioning plans and detailed funding plans are submitted by licensees. Consequently, the NRC should retain its present regulations with respect to environmental review at the time of a nuclear power plant decommissioning.

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#### COMMENTS

##### FUNDING ASSURANCE REQUIREMENTS

Much of the analytical approach utilized in developing these comments is taken from the Final Report on Funding Nuclear Power Plant Decommissioning prepared by Burns, et al., of the National Regulatory Research Institute for the United State Department of Energy ("NRRRI Report").<sup>1</sup> Since the analysis in the NRRRI Report is referenced throughout these comments, a copy has been attached for ease of reference.

The NRRRI Report is extremely helpful in establishing an analytical method for comparing alternative funding methods by equaling the risk inherent in each method. However, risk equalization is not sufficient to decide among competing funding alternatives. The NRC's regulation in this area must be designed to minimize intrusion into the traditional state jurisdiction of economic regulation of intrastate electric utility rates. This would allow the state and its utilities to choose among alternative decommissioning funding methods by considering the cost to ratepayers of any particular alternative, and the ability of the alternative to recover the cost from those

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ratepayers who are experiencing the benefits of the facility, as well as funding assurance criteria.

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Utilizing those criteria the Illinois Attorney General's Office has evaluated the proposed rule published in 50 Fed. Reg. 5600 (1985) and, on behalf of the People of Illinois, supports, in large part, the funding requirements set forth. In particular, the People of Illinois strongly endorse the requirement of an external fund for all decommissioning activity requiring temporary on-site storage. 10 C.F.R. 50.82(c) as proposed in 50 Fed. Reg. 5620 (1985). The People of Illinois also suggest in the following comments that modifications to three sections of the proposed rule would enhance the funding assurance by:

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1. extending the external funding requirement of proposed Part 50.82(c) to any decommissioning activity which will require more than one year to accomplish;
2. limiting the circumstances within which the certification of funding capped at \$100 million may be used to instances where it is shown that the expected cost will not exceed that amount; and
3. placing some qualifications on the use of the internal funding alternative set forth in the proposed Part 50.33(k)(4)(iv) that first would require a good faith effort to establish a least cost external fund.

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The People of the State of Illinois Endorse the Proposed 10 C.F.R. Part 50.82(c)

A key proposed amendment to 10 C.F.R. Part 50 is the NRC's proposed 10 C.F.R. Part 50.82(c), which requires that any applicant proposing a decommissioning plan which anticipates delays in completion "by including a period of storage or long-term surveillance" must provide a prepaid external fund or surety. 50 Fed.

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Reg. 5620 (1985). The People of Illinois strongly endorse the requirement of an external fund in such circumstances. There are two reasons for this endorsement: the facility is no longer capable of generating revenue, thus allowing the cost-causer to avoid the burden of decommissioning if funds are accumulated post operation; and the use of an external fund will ensure efficient, the highest return for a given market risk, portfolio management, which minimizes the cost of assuring the availability of the funds.

Before elaborating on the reasons for this endorsement a point of clarification is necessary. The proposed Part 50.82(c) allows the use of a "fund certification" maintained in accordance with the criteria proposed in Part 50.33(k). Discussions with the NRC staff have indicated that this refers solely to certification under the proposed Part 50.33(k)(3)(iv) which is restricted to government licensees. The People of Illinois' endorsement of the proposed Part 50.82(c) is subject to clarifying language that restricts the use of fund certification to government licensees.

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The primary reason compelling the People of Illinois' endorsement is the fact that the facility is no longer capable of generating revenue to fund a decommissioning plan. A proper approach to decommissioning funds will attempt to obtain the funds for decommissioning from those customers who benefit from the electricity generated by the facility. The further away in time after cessation of operation that funds are raised, the less likely that the proper individuals are funding the decommissioning. In instances where temporary storage in SAFSTOR could last 20-30 years (the proposed rule allows for 100 years) this becomes a severe problem.

Furthermore, if a prepaid external fund is not required, then there could be a conflict between the need for funds to replace the generating capacity being decommissioned and the need for decommissioning funds. In that latter instance, further delay of decommissioning could occur, not for safety related reasons, but simply to minimize cash flow problems associated with a construction program.

An additional reason of endorsing the proposed Part 50.82(C) is that an external fund will result in a diversified portfolio of investment. This diversified investment is efficient in that the greatest return is earned for a given market value of risk. That result is not likely if the funds are invested entirely in the applicant's assets, because the funds are exposed to the unsystematic risk of the applicant's returns. This characteristic of external funds, and their inherent superiority over internal funds, will be discussed in more detail in the last section of these comments.<sup>2</sup>

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Thus, the People of Illinois support the NRC's proposal that any decommissioning plan which anticipates temporary storage of the facility on-site must provide a prepaid external fund or its equivalent at the time that decommissioning commences. This endorsement is subject to clarification that only government licensees may make use of the certification option.

The People of the State of Illinois Suggest That the NRC Extend the Proposed Requirement of Part 50.82(c) to Certain Immediate Decommissioning Plans.

Furthermore, the People of Illinois suggest that the external funding requirements proposed in Part 50.82(c) be extended to include any decommissioning plan that anticipates immediate disassembly of the facility if the decommissioning will take longer than one year to complete. The reasons for this suggestion are identical to those supporting the endorsement of the proposed Part 50.82(c). Primary, of

course, is the reality that the facility is incapable of generating additional revenues during decommissioning.

However, extending the Part 50.82(c) requirements to immediate decommissioning activity would have a desirable incentive effect on the funding method utilized during the operating life of the plant. Any facility owner faced with the absolute requirement of creating an external fund for any decommissioning which will take longer than one year to complete will chose the method of accumulating funds most likely to result in sufficient funds to meet that requirement. In addition, there is an incentive to chose a method which accumulates those funds over the life of the facility from the individuals enjoying the benefits of the facility.

The People of the State of Illinois Suggest That the Option of Part 50.33(k)(1), Which Caps Funding Requirements at \$100,000,000, Be Modified.

The proposed Part 50.33(k)(1) allows an electric utility, in lieu of a decommissioning funding plan, to provide "certification that financial assurance for decommissioning will be provided in an amount at least equal to \$100,000,000 (1984 dollar)." 50 Fed. Reg. 5618 (1985). While the cost estimates provided to the NRC indicate a mid-point estimate that is below \$100,000,000 for decommissioning a reference nuclear power plant, they also indicate that the high end of the cost range is in excess of that amount. The full range of possible costs, as reported in the NRRI Report is from \$47.2 million to \$145.8 million in 1982 dollars. NRRI Report at 36. The People of Illinois suggest that the certification option of Part 50.33(k)(1) should be allowed only upon a showing by the applicant that its expected cost will not exceed \$100,000,000 in 1984 dollars. It is only common sense that the NRC not

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allow the \$100,000,000 certification option as a method for avoiding the necessity of guaranteeing a greater amount.

D.2.1(b)

There remains significant uncertainty about the actual cost of decommissioning a nuclear reactor. Two factors continue to contribute to this uncertainty. They are, the ability of the facility owner to dismantle the facility without excessive occupational radiation exposure and the determination of the quantity of waste which will require deep geologic disposal. Both of these factors will become less uncertain as more experience is gained. However, for at least the next several years, the uncertainty is sufficient to prohibit assuming that the maximum cost is \$100,000,000 in 1984 dollars.

Decommissioning is a labor intensive activity and any change in the ability of laborers to dismantle the facility, particularly in the early years when the levels of 60-Cobalt are especially high, could result in significant cost increases. However, studies provided to the NRC indicate that probable effect of such increased labor cost is not excessive.<sup>3</sup>

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That is not true of possible cost increases due to radioactive waste disposal issues. The Addendum to NUREG/CR-0130<sup>4</sup> reports the results of a sensitivity study of the cost estimate for decommissioning a pressurized water reactor. The Addendum reports that if all the waste contaminated with long-lived radionuclides were disposed of in a deep geologic disposal site, as opposed to shallow land burial, the cost could increase by \$191 million in 1984 dollars.<sup>5</sup> This would clearly overwhelm the decommissioning cost and impose severe burdens of facility owners. Yet even that sensitivity result was obtained using the lowest available estimate of deep geologic disposal costs, \$7,100/m<sup>3</sup>. If the full range of possible deep

geologic disposal costs, \$7,100/m<sup>3</sup> to \$21,000/m<sup>3</sup>,<sup>6</sup> were used, then the \$191 million could be tripled.

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Since no large, 1,100 megawatt, unit has yet completed a full life cycle, there remains considerable uncertainty about the true cost of decommissioning. A conservative approach dictates the suggestion that the use of the fund certification cap be limited until such experience is gained.

For the reasons outlined in this subsection the People of Illinois suggest that the NRC not allow automatic use of the funding certification option in the proposed Part 50.33(k)(1) without a showing that the expected costs to the applicant will not exceed \$100 million.

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Finally, the People of the State of Illinois Suggest That the NRC Limit the Use of the Funding Option Under Part 50.33(c)(2)(iv).

The proposed amendment published as 10 C.F.R. Part 50.33(k)(2)(iv) allows for internal funding during the operating life of a nuclear facility. Because the discount rate most commonly used in establishing the present value of the future decommissioning costs results in the negative salvage funding method appearing artificially less costly than external methods, and because of the superior portfolio management aspects of external funds, the NRC should allow the use of internal funding for nuclear power plant decommissioning only in limited circumstances. The circumstances include when the facility owner is unable to obtain the agreement of a government entity to act as trustee of the external fund and there is no other external funding arrangement that can generate tax free income.

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If the funding alternatives are properly adjusted to equalize the relative risk of each fund the most important factor affecting the relative cost of each fund is the

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tax effect. An excellent discussion of both the proper method for equalizing the risk of the alternatives and of the tax effects of each alternative is provided in detail in the NRRI Report. The following discussion is a rough outline of the central points of the NRRI Report to facilitate the analysis in these comments.

First, the NRRI Report demonstrates that all the proposed funding alternatives can be equalized for relative differences in risk with the use of the proper discount factor. A two step process is outlined in which the future uncertain revenue of a funding method is converted to present value with the expected interest rate inherent to the particular funding alternative. This present value is next converted into a future certain value with a risk free discount rate (or a discount rate less than the risk free rate). NRRI Report at 80-87. By equating the future uncertain value and the future certain value of all the alternatives a risk free comparison can be conducted.

The most important consequence of making such risk equivalent comparison is that it demonstrates that there is no inherent difference between internal and external mechanisms as long as the tax treatment and assurance of funding are the same for both. Thus, a properly calculated internal fund is not necessarily less costly to implement as long as the amount collected is calculated with this risk free method. The problem is that, as a practical matter, no state regulatory agency is going to implement an internal funding method using such a discount rate. To do so significantly increases the amount of funds which must be collected each year on the basic premise that the future revenue earnings of the utility are random and uncertain. Traditionally such internal funding methods utilize the utilities allowed rate of return as the discount rate. This results in the internal funding method

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appearing to be significantly less costly than external funding methods. It is an illusion, and internal funding methods based on such a discount rate run a significant risk of generating insufficient funds by the time of decommissioning.

However, even if an internal funding method is properly implemented with a risk free discount rate, the tax effect on most external funding methods continues to make them more costly than the internal negative net salvage method. This is because the income to the external trust is taxed, and it would not be efficient to place all of the external funds in government bonds. The only type of external fund not confronted with this problem is one in which the government is the trustee. Thus, as a practical matter, the only real cost effective choices available to a facility licensee are an external fund with the government as trustee and an internal unsegregated fund such as negative net salvage. NRRI Report at 114.

One factor which may be sufficient to overcome the tax effect on income of an external fund is the reduced risk associated with the diverse portfolio of a properly run external fund. An internal fund will normally invest its funds entirely in the licensee's facilities. Such investment is subject to the unsystematic risk of the utility as well as market risk. A properly run external fund will invest in a diverse portfolio of securities thus eliminating any unsystematic risk and exposing itself only to market risk. This feature makes external funding methods inherently superior to internal funding methods. However, it is questionable whether this is sufficient to overcome the tax effect on an external fund's income.

If the trustee is the government, then a fund's income is tax free and the external fund is clearly superior to any internal fund. Thus, the People of Illinois suggest that the use of an internal funding method should only be allowed in those

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circumstance where the licensee has shown that it is unable to get a government agency to agree to act as trustee of an external fund. Or, in the event that Congress creates an exception where decommissioning funds can be placed in trusts whose income will not be taxed, then such an external fund must be utilized.

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#### ENVIRONMENTAL REVIEW REQUIREMENTS

It is fundamental that NEPA requires NRC to make "a case-by-case balancing judgment" of the particular economic and technical benefits of a planned action against its environmental costs: "[m]uch will depend on the particular magnitudes involved in particular cases. \*\*\* The point of the individualized balancing analysis is to ensure that, with possible alterations, the optimally beneficial action is finally taken." Calvert Cliffs' Coordinating Committee v. U.S. Atomic Energy Comm'n. 449 F.2d 1109, 1123 (D.C. Cir. 1971). (Emphasis added.)

Despite this well-established mandate of NEPA, the NRC proposes to eliminate the present requirement that an environmental impact statement ("EIS") be prepared at the time a license amendment is issued authorizing the decommissioning of a nuclear power reactor or other facility licensed under Parts 50 or 72 of the NRC's regulations. This proposal is based primarily upon the generic environmental impact statement ("GEIS") and its supporting technical data base. While a generic EIS may be sufficient when it contains all the analysis required by NEPA (U.S. v. 162.20 Acres of Land, 733 F.2d 377, 381 (5th Cir. 1984)), it is clear that where there are variations in the proposed actions, a site-specific EIS must be conducted. See Oregon Environmental Council v. Kunzman, 714 F.2d 901, 904-05 (9th Cir. 1983); Natural Resources Defense Council v. U.S. Nuclear Regulatory Comm'n., 606 F.2d 1261, 1271 (D.C. Cir. 1979).

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In Lower Alloways Creek Township v. Public Service Electric & Gas Co., 687

F.2d 732 (3rd Cir. 1982), the Court admonished the NRC regarding use of a generic

EIS:

As for GEIS, it is clear that the NRC cannot use that document as a proxy for the more individualized consideration of a particular expansion proposal that NEPA would appear to require \*\*\* . 687 F.2d at 748

The NRC's proposed reduction of the environmental review requirements runs afoul of that admonition. The NRC itself recognizes that the costs and environmental impacts of decommissioning are dependent upon the specific decommissioning procedures selected by the licensee. (50 Fed. Reg. 5609 (1985)) Yet the NRC proposes to rely upon the GEIS - which by definition is not site specific - and the EIS prepared at the operating license stage - which is conducted before a particular decommissioning plan has been selected.

In this light, the proposal to eliminate the requirement for an EIS in favor of an environmental assessment ("EA") is clearly improper under NEPA. As stated by the court in Lower Alloways Creek Township, supra at 741, the difference between an EIS and an EA is "considerable":

An Environmental [Assessment] is a "concise" and "brief" statement discussing whether an EIS is necessary and evaluating the environmental impacts and alternatives of a proposal. By contrast, an EIS is an elaborate document which, according to the Act, must be "detailed".

It is a detailed assessment that NEPA requires when there will be significant variations in the proposed actions as well as in the site-specific circumstances in which those actions will be conducted, as in the instant case. Consequently, the

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NRC's proposed elimination of a required EIS for decommissioning activities would be contrary to NEPA.

As a matter of policy, reduction of the environmental review requirements for decommissioning actions is inappropriate for several reasons. Firstly, decommissioning technology is largely unproven: decommissioning has not been conducted at a large-scale commercial reactor since no such facility has yet completed its life cycle. Secondly, under the proposed rules, decommissioning techniques will vary significantly from site to site. Moreover, each facility site is environmentally different; many sites are unique in their environmental and geophysical circumstances. Thus, it is inappropriate and, indeed, not feasible to fully and accurately assess the environmental impacts of varying decommissioning techniques in different environmental settings.

Furthermore, the financial condition of licensees will vary tremendously at the time of decommissioning and is difficult to predict at present, as the NRC concedes. (50 Fed. Reg. 5606 (1985)) In addition, the funding assurance plans will differ depending upon the licensee's choice and decisions of state ratemaking authorities. In these circumstances, it is especially important to conduct a particularized evaluation of each licensee's funding assurance plan as part of the EIS cost-benefit analysis. Consequently, the NRC's proposed elimination of funding assurance plan approval from the environmental review process is ill-advised.

In summary, a site-specific environmental impact statement that includes an evaluation of the licensee's funding assurance plan is required by NEPA. Therefore, a reduction of the environmental review requirements and complete elimination of

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the funding assurance plan assessment would be contrary to law and sound environmental policy.

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#### CONCLUSION

In conclusion, the People of the State of Illinois for all the reasons described above recommend the following:

1. that the proposed Part 50.82(c) is proper, subject to the clarification that the fund certification option is available only to government licensees;
2. that the proposed Part 50.82(c) be extended to immediate disassembly plans that will require more than one year to complete;
3. that the proposed Part 50.33(k)(1) be modified to exclude the use of fund certification for \$100,000,000 unless the applicant demonstrates that its actual cost will be less than that amount;
4. that the funding options available under the proposed Part 50.33(k)(4)(iv) be subject to the prior requirement that the applicant make a good faith effort to obtain either a government agency as trustee of an external fund or some equivalent which is capable of generating tax free income; and
5. that the environmental review for decommissioning actions, including the assessment of funding assurance plans, not be reduced.

Respectfully Submitted

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#### NOTES

<sup>1</sup>Robert E. Burns, J. Stephen Henderson, William Pollard, Timothy Pryor, and Yea-Mow Chen; Final Report on Funding Nuclear Power Plant Decommissioning; The National Regulatory Research Institute prepared for the U.S. Department of Energy, Grant No. DE-FG01-80RG10268 (1982); Hereinafter referred to as the NRRI Report.

<sup>2</sup>See also the NRRI Report chapter 6.

<sup>3</sup>R.I. Smith and L.M. Polentz; Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station, Pacific Northwest Laboratory Operated by Battelle Memorial Institute, prepared for the U.S. Nuclear Regulatory Commission, NUREG/CR-0130 Addendum (1979), p. 2-7.

<sup>4</sup>Id.

<sup>5</sup>Id., p. 7-5.

<sup>6</sup>Id., p. 7-4.



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REG NUMBER PR-30, 40, 50 et al (130)  
PROPOSED RULE (50 FR 5600)

AMES W. TAYLOR  
General Manager

July 12, 1985

(808) 788-4000

In reply, please  
refer to LAC-11017

United States Nuclear Regulatory Commission  
Office of the Secretary  
Washington, DC 20555

DOCKETED  
USNRC

Attention: Docketing and Service Branch

'85 JUL 12 P3:14

Gentlemen:

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

SUBJECT: Comments on the Proposed Decommissioning Rule;  
Docket No. 50-409

Dairyland Power Cooperative, Licensee for the La Crosse Boiling Water Reactor (LACBWR), a 50 MWe BWR, hereby states its opposition to the Commission's proposed rule for the establishment of reserve funds for reactor decommissioning.

D.8.1

The proposal to establish a fixed sum of \$100,000,000 per reactor for decommissioning purposes is inappropriate. This level of cost assumes that all reactors, both large and small, have the same decommissioning requirements. We believe that small nuclear reactor plants may be more easily decommissioned due to smaller disposal volumes, smaller surface decontamination requirements, and the handling of smaller and lighter weight components. Therefore, a small reactor plant, such as LACBWR, should be permitted to accumulate a lesser amount in anticipation of its decommissioning costs.

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Dairyland Power, therefore, specifically requests that the proposed rule be amended to allow small reactor plants (under 100 MW) to provide a decommissioning fund in the order of \$20,000,000 (1985 dollars) rather than the full \$100,000,000 fund.

Accumulation of a decommissioning fund at the \$100,000,000 level proposed imposes an undue financial burden on the operators of small nuclear reactor plants. Further, the application for an exemption with the attendant processing, legal, and consultant fees is a time consuming and expensive process in order to obtain relief from such an unfair rule.

Your consideration of this request prior to the promulgation of the rule is, in our opinion, in the public interest.

Sincerely,

JWT/ajm

JUL 12 1985

Acknowledged by card.....

J-517

ASSET NUMBER  
PROPOSED RULE PR-30,40,50 et al.  
(50 FR 5600) (131)

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July 12, 1985

WRITER'S DIRECT DIAL  
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Mr. Samuel J. Chilk  
Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

'85 JUL 12 P4:48

DOCKETING SECTION  
BRANCH

Re: Proposed Rule Regarding Decommissioning  
Criteria For Nuclear Facilities, 50 Fed.  
Reg. 5600 (February 11, 1985)

Dear Mr. Chilk:

On May 13, 1985 the Utility Decommissioning Group ("UDG") filed comments with the Commission regarding the proposed rule on decommissioning criteria. The purpose of these additional comments is to respond briefly to the comments filed by several other parties and to bring to the Commission's attention an additional site specific decommissioning cost study that was completed after UDG's May 13 comments had been filed with the Commission.<sup>1/</sup>

A. The Criticisms Of Various Commenters Do Not Undermine The Correctness Of The Commission's Approval Of Internal Funding

The Commission's February 11, 1985 proposed rule correctly concludes that internal funding is appropriate for multi-asset utilities and provides reasonable assurance of the availability of decommissioning funds. 50 Fed. Reg. at 5608, Cols. 1-2. Many comments filed support the Commission's conclusion, including state regulatory agencies and numerous investor- and government-

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<sup>1/</sup> As noted in UDG's May 13 comments, the Group consists of 13 power reactor licensees and the Edison Electric Institute. The thirteen licensees are: Arkansas Power & Light Company, Carolina Power & Light Company, Duke Power Company, Jersey Central Power & Light Company, Metropolitan Edison Company, Northeast Utilities, Pacific Gas and Electric Company, Pennsylvania Electric Company, South Carolina Electric & Gas Company, Southern California Edison Company, Texas Utilities Electric Company, Virginia Power Company, and Yankee Atomic Electric Company.

ACKNOWLEDGED BY CARD JUL 12 1985  
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[Signature]

Mr. Samuel J. Chilk  
July 12, 1985  
Page 2

owned utilities. These comments also reaffirm the position that the choice between alternative funding methods is for rate regulators to determine.

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On the other hand, comments filed by various organizations object to internal funding. These comments, however, offer nothing that has not already been fully considered by the Commission. For example, the report that Public Citizen/Environmental Action ("Public Citizen") filed as its comments on the Commission's proposed rule repeats the objections to internal funding that Public Citizen submitted in connection with the September 20, 1984 briefing to the Commission on the financial and technical aspects of decommissioning. Compare, e.g., the report Public Citizen submitted May 3, 1985 as its comments in this rulemaking, p. 6, with the written comments Public Citizen submitted at the September 20, 1984 Commission briefing, pp. 2-3. These views were, therefore, already considered by the Commission and its staff prior to issuance of the February 1985 proposed rule approving internal funding.

D.3.2.1.2

The basis of these objections is that "since no funds are physically set aside" under the internal funding method, it is not a "guaranteed" fund, and "when compared to" other methods provides lesser assurance.<sup>2/</sup> Contrary to these contentions, the issue here is not whether a particular method "guarantees" funding or provides the "highest" level of funding assurance. Instead, the relevant legal standard is whether the internal reserve provides a reasonable level of assurance. That is the standard that governs the Commission's health and safety determinations under the Atomic Energy Act. See UDG's May 13 comments, pp. 15-17.

D.3.2.1.1(b)

The opposing commenters, however, do not even address the reasonable assurance standard. Indeed, they offer nothing to undermine the conclusions of the Commission, its staff and consultant, Professor Siegel, reached after very careful, exhaustive consideration, that the internal reserve satisfies the reasonable assurance standard and, in Professor Siegel's words, "provides excellent assurance of the availability of funds." See 50 Fed. Reg. at 5608, cols. 1-2; NUREG-0584, Rev. 3, Assuring the Availability of Funds for Decommissioning Nuclear Facilities, p. 49; NUREG/CR-3899, Utility Financial Stability and the Availability of Funds for Decommissioning, p. 13. Cf., 50 Fed. Reg. at 5609, Col. 2 ("[T]he Commission does not believe it is necessary, or desirable, to require a specific financial method for collecting

<sup>2/</sup> See, e.g., comments of Public Citizen, p. 6; comments of Citizens Assn. For Sound Energy, p. 3; comments of Maine Nuclear Referendum, p. 2; comments of Redwood Alliance, p. 8.

Mr. Samuel J. Chilk  
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Page 3

decommissioning funds"). Moreover, the internal reserve provides fully adequate funding assurance even in the case of utilities experiencing severe financial difficulty, as both the Commission and Professor Siegel concluded. See 50 Fed. Reg. at 5608, Col. 2; NUREG/CR-3899, p. 10; see also UDG's May 13 comments, p. 18. In short, the Commission's approval of the internal reserve as an appropriate decommissioning funding method is entirely sound and correct.<sup>3/</sup>

D.3.2.1.1(b)

B. Analysis Of Comments Filed Underscores The Need To Eliminate The Battelle-Derived \$100 Million Certification Method And Emphasize Instead Reliance On Site Specific Cost Studies

UDG's May 13 comments explain that the proposed \$100 million certification method is not sufficient funding in most cases and that site specific studies for large-scale commercial power reactors substantially exceed \$100 million. See UDG's May 13 comments, pp. 6-10. UDG's comments also emphasize that the Battelle Studies, NUREG/CR-0130 and NUREG/CR-0672, which are the basis for the \$100 million amount, were intended to describe

D.2.1(a)

3/ Public Citizen also suggests that "utilities may use [the internal reserve] for new investment projects, with no need to insure that the money taken from customers will be available in the future for decommissioning." Comments of Public Citizen, p. 34. Similarly, Redwood Alliance suggests that decommissioning funds can be used to pay operating expenses. Comments of Redwood Alliance, p. 6. Such contentions have no basis. On the contrary, as explained during the Commission's September 20, 1984 public meeting on decommissioning, Tr. 43, 49-50, rate regulatory agencies assure that ratepayer-contributed funds earmarked for decommissioning will be used for that purpose, and ratepayers are fully protected. Public Citizen also suggests that through "holding-company maneuvers," a licensee could be "'spun off' in a financially weak condition," making decommissioning "very difficult financially." Comments of Public Citizen, p. 36. This claim is specious. It has no legal or factual support.

In addition, the Nuclear Information And Resource Service ("NIRS") suggests that the Commission require insurance to "back up" both internal reserves and external sinking funds in the event that a plant is shut down prematurely for economic reasons. Comments of NIRS, p. 14. There is no such insurance available, however, as NIRS recognizes on the previous page of its comments. Moreover, in approving the shutdown of a plant for economic reasons, the rate regulatory authority will provide not only for recovery of decommissioning costs, but also for recovery of the licensee's unamortized investment in the plant.

Mr. Samuel J. Chilk  
July 12, 1985  
Page 4

decommissioning costs in terms of an order of magnitude only and were not intended as a substitute for site specific cost studies. Id. In addition, UDG explained that although \$100 million usually understates decommissioning costs, the Commission's statement that \$100 million is sufficient to decommission most reactors, coupled with the Commission's concern for adequate decommissioning funding, will lead utility rate case intervenors to argue that \$100 million should be a presumptive cost ceiling in rate cases. Id., pp. 10-11.

UDG's concerns were justified. Comments filed by a group of wholesale power purchasers describe the \$100 million certification amount as "conservatively high" and state that \$100 million "would appear to significantly overstate decommissioning costs for many of the nuclear generating units owned and operated by utilities across the country." See comments of Public Systems, and the accompanying affidavit of Jacob Pous, pp. 3-4. These comments urge the use of the Battelle Studies and the "scaling factors" developed in those studies as a basis for determining different categories of decommissioning cost as a function of plant size. Comments of Public Systems, p. 14. The same comments suggest that "it is not clear that collections from today's ratepayers are necessary in the interest of public safety." Id., p. 32, n. 25.

D. 2.1(a)

Comments such as these portend the difficulty that utility licensees may encounter in seeking adequate levels of decommissioning funding. By describing the Battelle-derived \$100 million certification amount as sufficient for most power reactors, the Commission increases that difficulty and unnecessarily injects itself into matters of ratemaking. See UDG's May 13 comments, pp. 6-12. The critical facts here, as emphasized by the Battelle studies themselves and one of their principal authors, R.I. Smith, is that those studies represent "order of magnitude estimates" only and a "realistic estimate" of the decommissioning cost for a given reactor requires "a quite detailed analysis of the specific plant under consideration."<sup>4/</sup> It is for these reasons that UDG recommends that the Battelle-derived \$100 million certification method be deleted from the proposed rule, and the Commission instead rely on site specific cost studies.<sup>5/</sup>

4/ See UDG's May 13 comments, pp. 7-8, quoting NUREG/CR-0130 Vol. 1, p. 12-9 and letter from R.I. Smith to H.R. Prins, October 29, 1982 (emphasis added).

5/ Alternatively, if the Commission does not delete the certification method, it should increase the amount and clarify the purpose of certification, as explained in UDG's May 13 comments, pp. 11-12.

Mr. Samuel J. Chilk  
July 12, 1985  
Page 5

\* \* \*

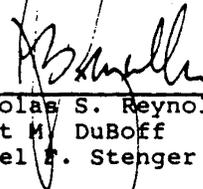
Finally, UDG wishes to update the list of recent site specific decommissioning cost studies described in UDG's May 13 comments (at p. 9). The updated list is as follows:

Capacity (MWe)	Reactor Type	Date of Study	Removal Cost:		
			Radioactive	Nonradio- active	Total
1090	BWR	5/85	\$142,435,000	\$41,025,000	\$183,460,000
940	BWR	3/85	117,618,000	43,507,000	161,125,000
610	BWR	3/85	111,946,000	30,763,000	142,709,000
1150	PWR	5/85	100,510,000	34,743,000	135,253,000
1205	BWR	5/85	138,303,000	49,461,000	187,764,000

D.1.1.1  
D.2.1(a)

An additional site specific study completed at the end of May has been added to this list (the 1205 MWe reactor), and the data for the first reactor listed was revised subsequent to submission of UDG's May 13 comments.<sup>6/</sup> Also, as noted in the previous UDG comments (at p. 9), this site specific cost data is shown prior to inclusion of a contingency allowance. Adding a contingency allowance will further increase the disparity between these site specific studies and the \$100 million certification amount in the proposed rule.

Respectfully submitted,



Nicholas S. Reynolds  
Scott M. DuBoff  
Daniel F. Stenger

Counsel to the Utility  
Decommissioning Group

<sup>6/</sup> Radioactive removal costs increased and non-radioactive removal costs decreased (also the capacity for this plant is 1090 MWe, not 1000 MWe).

BOOKS NUMBER  
PROPOSED RULE **PR-30,40, 50 et al**  
(50 FR 5600) **(132)**

P. O. BOX 1400, TAMPA, FLORIDA 33601

DOCKETED  
NRC

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OFFICE OF PUBLIC AFFAIRS  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20540

July 12, 1985

L-85-269

Mr. Samuel J. Chilk, Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Docketing and Service Branch

Dear Mr. Chilk:

Florida Power & Light Company would like to take this opportunity to submit its comments on the Proposed Rule - Decommission Criteria for Nuclear Facilities (50 Fed Reg. 5600-5625, 11 February 1985). The Company has reviewed the proposed rule and is submitting its comments in two sections: General Position and Specific Issues.

Very truly yours,

J. W. Williams, Jr.  
Group Vice President  
Nuclear Energy

JWW/DAB/eab

Attachment

Acknowledged by card..... **JUL 16 1985** *pd*

PEOPLE . SERVING PEOPLE

J-523

## GENERAL POSITION

The Nuclear Regulatory Commission (NRC) has primary responsibility for ensuring public health and safety with respect to the construction, operation, and decommissioning of nuclear power plants. Working within the guidelines established by the NRC, Florida Power & Light is justifiably proud of its accomplishments in providing safe, reliable, nuclear power. As such, Florida Power & Light does not question the legitimacy of the NRC's desire to assure that decommissioning will proceed in a safe, complete manner.

G.1

Our primary contention with the proposed NRC rulemaking exists only to the extent that the NRC prescribes specific decommissioning criteria, such as financing methods, funding levels and decommissioning methods, on the utility industry. The full responsibility for developing and implementing the details of decommissioning criteria should be between each utility and its regulatory authority of primary jurisdiction. The NRC should have the authority to review these criteria, but only directly intervene if it can be demonstrated that public health and safety will be adversely affected because a utility or its primary regulatory agency have failed to establish any decommissioning policy.

There are several reasons why it is appropriate for utilities and their principal regulatory commissions, rather than the NRC, be given the responsibility for implementing their own decommissioning criteria. First, with respect to financial assurances, state public service commissions (PSCs) and the Federal Energy Regulatory Commission (FERC) have traditionally been responsible for ensuring that utilities are financially capable of meeting all their costs and service obligations. In this context, decommissioning should be treated no differently than other utility obligations. Second, State PSCs and FERC have the jurisdictional responsibility for all rate making matters. Many regulatory agencies, including the NRC, impose quality of service obligations on utilities. However, the imposition of quality of service standards does not extend the authority to interfere in the process by which the costs for this service are recovered from customers. The final authorities on the price for utility services are State PSCs and FERC. Third, each utility and its principal regulatory agency are in the best position to determine the decommissioning criteria which will best suit their unique needs. Provided that the criteria selected will assure public health and safety, the costs and benefits of each decommissioning alternative as evaluated by each utility and regulatory agency will determine the optimal decommissioning criteria for the nation as a whole. The NRC should not interfere in this process beyond health and safety issues. Finally, it is likely that NRC intervention into decommissioning criteria will lead to regulatory conflicts with State PSCs and FERC. This would only act to delay adequate decommissioning planning, and jeopardize timely implementation.

D.8.1

D.8.3.1

G.1

In particular, financing methods and funding for decommissioning activities can best be developed between State PSCs and utilities. The ability of State PSCs to act in a manner that will allow utilities to collect sufficient funds has been reviewed by the NRC. The NRC, in the proposed rulemaking for eliminating financial qualification review for utilities applying for operating licenses (49 Fed. Reg. 13044-13040, 2 April 1984), stated in the Supplementary Information:

The Commission believes it reasonable to conclude that, as a general rule, the rate regulation process assures for regulated electric utilities (or those able to set their own rates) the ability to meet the costs of safe operation of a nuclear power facility. (p. 13045)

The fact that nearly all utilities with nuclear facilities have or will shortly initiate collection activities for decommissioning costs under their State PSCs authority testifies to the fact that the present state rate regulation process is capable of accumulating the necessary funds.

Florida Power & Light has already been required by its PSC to fund a reserve for decommissioning of its licensed units. That fund, which is an amount less than required in the proposed rule, is an internal reserve being funded by revenue collected through retail rates. The Florida PSC, through its rate setting function, is completely advised as to our financial condition and has statutory authority to require such reports respecting the financial viability of Florida Power & Light as it deems necessary. The jurisdiction examined by the PSC respecting retail rates is parallel for wholesale rates by the jurisdiction of the FERC.

While the NRC has developed a series of NUREG/CR reports on studies of the technology, safety, and costs of decommissioning various kinds of nuclear facilities, the information base for rulemaking is incomplete. Missing from this data base is the existing State PSCs and FERC regulatory framework for developing decommissioning funds and the kind and amount of existing (or planned) decommissioning funds. This information will reveal to the Commission that utilities have taken specific actions in assuring that adequate funding will be available.

As was stated earlier, our contention with the proposed rulemaking is the extent to which specific decommissioning criteria are being proposed for the utility industry. While utilities are developing and implementing decommissioning plans with State PSCs, there are other licensees for whom the NRC is the regulatory authority of primary jurisdiction or secondary jurisdiction through the State Agreement Program. As stated in the proposed rulemaking "Regulatory Analysis", the NRC must "determine which licensees need to provide financial assurance" (p. 8). The staff has stated that ". . . the historical record indicates that relatively small licensees (that do not require a radiological contingency plan) may default and may have the potential for a substantial contamination problem" (pp. 8-9). If the concern is the default or abandonment by small companies of their facilities, the proposed rule should be designed to address that problem. Unless the Commission can provide documentation on the likelihood of utilities not having funds available for decommissioning, the proposed rule should only address those

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types of licensees who have a high risk of defaulting or abandoning their facilities.

Another concern Florida Power and Light has with the proposed rule is that the Commission has incorrectly focused the purpose of this rulemaking. Rather than delineating the requirements for a licensee to terminate its license, the proposed rulemaking is concerned with the financing of decommissioning, which is only part of the process in terminating a license. The NRC is responsible for developing decontamination, standards, ensuring the proper handling and disposal of radioactive waste, and setting safety standards, but the proposed rulemaking does not address these issues. The proposed rule would not assist a licensee who would choose to begin actions to terminate its license within the next three years. This proposed rulemaking should be redirected toward clearly defining a licensee's responsibilities and setting specific safety standards for license termination.

G.1

## SPECIFIC ISSUES

### Generic Prescribed Funding Level of \$100 Million

The establishment of a prescribe funding level of \$100 million (1984 dollars) is counter-productive relative to the NRC's concern that utilities be financially capable of satisfying their decommissioning obligations. State PSCs and the FERC determine the costs utilities can charge to customers for decommissioning. Despite the fact that utilities may be able to justify that decommissioning cost will exceed \$100 million in the future, state regulators will likely use the NRC prescribed level as an upper limit. Similarly, an NRC sponsored inflation rate, which may or may not approximate the changes in decommissioning costs in the future, may also be treated by State PSCs in a similar manner. If shareholders are to be expected to pay for the difference between the customer funded level and actual costs, there is a risk that decommissioning may not proceed in a safe, timely manner. Therefore, any prescribed funding level and inflation rate may undermine the NRC objective of financial assurance. Florida Power & Light recommends that proposed Sections 50.33 and 50.54 (cc) be removed from the proposed rulemaking.

D.2.1(a)

### Funding Mechanisms

The NRC's discussion of the appropriate method of recovering for decommissioning costs stems from the concern that utilities provide sufficient financial assurance of the availability of funds at the time nuclear reactors are decommissioned. The NRC's concern with this matter is unwarranted for two reasons:

- The choice of the appropriate funding mechanism lies outside the NRC's jurisdictional responsibilities.
- Financial assurance is an inappropriate and incomplete basis for evaluating the various funding mechanisms.

D.8.1

D.8.3.1

Intervention into the method of funding for decommissioning costs is clearly outside the jurisdictional responsibility of the NRC. State PSCs and FERC are responsible for approving the timing and method of cost recovery for all utility costs. Decommissioning does not warrant unique treatment in this regard. Ratemaking entails more complexity than simply providing financial assurance. The NRC is correct in identifying that many funding mechanisms do exist. It would be entirely inappropriate and unprecedented for the NRC to impose a specific funding mechanism on a utility, its regulators, and customers. Individual utilities and states are in the best position to determine the funding options which best suit their needs. Also, imposing a specific funding mechanism would be contrary to the conclusion reached in NUREG/CR-3899, "Utility Financial Stability and the Availability of Funds for Decommissioning": ". . . from an economic and financial standpoint, any method of funding decommissioning, i.e., external reserves or internal reserves, is acceptable and provides excellent assurance of the availability of funds." (p.13)

D.3.1

The NRC's evaluation of funding mechanisms, with respect to the degree of financial assurance provided, is also inappropriate. Assuming that all funding mechanisms are designed to recover the appropriate dollar amount with accurate monitoring, decommissioning costs will be met. The risk that funds will be insufficient to safely decommission a nuclear unit if it experiences premature shutdown can be alleviated through insurance.

There are two possible scenarios, however, which may present risks with respect to adequate cost recovery. First, in the event that the NRC prematurely shuts down a safely operating nuclear plant due to an accident at a comparable plant owned by that utility or another utility, insurance coverage would not be sufficient to cover premature decommissioning costs for the utility that owns the safe plant. In this scenario, any shortfall between the funds actually recovered for decommissioning and actual costs will have to be covered by shareholders (barring emergency rate relief). The assumption that prepayment (immediate) funding would eliminate this risk would be incorrect. In light of the NRC proposal to establish a generic funding level of \$100 million, it is almost certain that prepayment will be insufficient to recover the actual costs of decommissioning. In effect then, the non-accidental shutdown problem is a risk associated with all the funding options. There would be no preferred option should this scenario occur. Second, in the event a utility goes bankrupt, adequate cost recovery may be jeopardized if the internal reserve method is used. However, the potential risk of utility bankruptcy is unlikely and should not be used by the NRC as a basis for selecting a particular funding option. The question of satisfying the financial requirements of decommissioning during periods of financial distress has been examined by the NRC ("Utility Financial Stability and the Availability of Funds for Decommissioning", NUREG/CR-30999) and it was found:

The market value of utilities, even those involved in the most extreme financial crises, is still far in excess of decommissioning costs. Therefore, even if the worst fears of investors are borne out, and the Public Utility Commissions do not allow substantial CWIP [Construction Work in Progress] to be included in the rate base, the value of the remaining assets, both tangible and intangible, are more than adequate to cover future projected decommissioning costs. (p. 13)

For example, at Florida Power & Light, the cash and accounts receivable balance as of year end December 1984 would cover approximately two times the expected decommissioning costs.

Florida Power & Light recommends that section 50.33 (k) be removed from the proposed rulemaking.

D.3.2.2.1

D.3.2.1.1(b)

D.8.1

### License Conditions

Proposed Section 50.54 would impose submission of decommissioning funding plans and retention of records as conditions of operating licenses. There are several reasons why operating licenses should not contain conditions for decommissioning activities.

- It permits a person to request a hearing any time a utility submits a modification to an approved financial assurance plan or requests an exemption under the notice and hearing procedures of 42 U.S.C.-82239. Hearings are not only costly and time consuming, but should be restricted to matters of nuclear safety.
- Allowing a hearing would provide a means for people who were not successful at the State PSC to reargue their case about the decommissioning funding plan with the NRC.
- Modifications to a license condition (e.g. deadline for environmental qualification) can cause difficulties both for the NRC and licensees.
- Section (dd) does not provide information regarding reporting requirements, updating requirements, type of records (i.e., Quality Assurance verified) or storage requirements.
- Decommissioning has little to do with nuclear plant operation. Criteria for decommissioning activities should be associated with termination of the operating license.

C.7.2  
D.4.4

Florida Power & Light recommends that Sections 50.54 (cc) and (dd) be eliminated from the proposed rulemaking.

### Submittal of Decommissioning Plan

Under proposed Section 50.82, a licensee must submit a proposed decommissioning plan within two years after ceasing operation, but no later than one year prior to license expiration. This section is unnecessarily restrictive and should be rewritten to allow utilities up to five years after ceasing operation to submit their decommissioning plan.

NRC has the responsibility under the Atomic Energy Act to ensure that all nuclear facilities are safely and completely decontaminated by the license holders and has the authority to require a decommissioning plan from its licensees. The submitted plan should be accurate, realistic, and feasible so that the NRC can effectively evaluate the proposed actions. Only after core unloading and other termination activities can the plant staff take measurements, inspect equipment and review records so that they may make decisions on decontamination strategies. It is at this time a licensee can develop a plan that will identify what techniques will be undertaken. Requiring a licensee to submit a decommissioning plan after cessation of operation does not negatively impact the public, since the site will

C.2.3

remain restricted, but favorably impacts the potential to decrease the exposure to employees and reduce decontamination costs since more data is available in developing an effective decommissioning plan.

C.2.3

Florida Power & Light recommends that Section 50.82 (a) be rewritten to allow a decommissioning plan to be submitted independently from an application for termination of license and each licensee be allowed up to five years after ceasing operation to submit their decommissioning plan.

C.4.2

#### Decommissioning Methods

Under proposed Section 50.82 (b), a method for decommissioning which delays completion will be considered acceptable "if sufficient benefit results". This standard of acceptability is vague and may be interpreted too narrowly. The supplementary information to the proposed rule implies that the decay of radioactivity is the sole consideration in determining if a delay is beneficial. While this is an important consideration, other situations may also be determined to be acceptable, such as:

B.3.1.1

- waiting for a "newer" plant at a two unit site to cease operation so that both units can be decontaminated at the same time
- delay in the development of high or low level burial site
- development of new decontamination techniques.

Florida Power & Light recommends that the proposed rule should be redrafted to allow for health, economic, and safety benefits to be co be considered acceptable reasons for delaying completion of decommissioning.

Florida Power & Light would like to express its appreciation in allowing us to comment on this proposed rule.

DOCKET NUMBER  
PROPOSED RULE **PR-30, 40, 50 et al (133)**  
(50 FR 5600)

DOCKETED  
USAFC



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Public Service  
Company of Colorado

2420 W. 26th Avenue, Suite 1000, Denver, Colorado 80211  
DOCKETING & SERVICE  
BRANCH

July 5, 1985  
Fort St. Vrain  
Unit No. 1  
P-85237

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn: Docketing and Service Branch

Docket No. 50-267

SUBJECT: Comments on Proposed Rule  
Setting Forth Decommissioning  
Criteria for Nuclear Facilities

Gentlemen:

Public Service Company of Colorado (PSC) has reviewed the proposed Decommissioning Criteria for Nuclear Facilities as published in the Federal Register (Vol. 50, No. 28, dated Monday, February 11, 1985) and offers several comments for consideration. The comments which are contained in the attachment to this letter address the financial assurance portion of the proposed rulemaking.

If there are any questions, please contact Mr. M.H. Holmes at (303) 571-8409.

Very truly yours,

*H.L. Brey*  
H.L. Brey, Manager  
Nuclear Licensing & Fuels Division

HLB/SLG:mb

Attachment

Acknowledged by card JUL 16 1985 *pd*

1. Section 50.33 (k)(2) - This proposed rule would require an electric utility to submit "either a proposed decommissioning funding plan or a certification that financial assurance for decommissioning will be provided in an amount at least equal to \$100,000,000 (1984 dollars) adjusted annually for inflation using an inflation rate twice that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics".

PSC has two concerns with this proposed rule. The first concern has to do with the use of the Consumer Price Index as the basic inflation indicator; the second concern has to do with the stipulation that annual adjustments for inflation use an inflation rate twice that indicated by the change in the Consumer Price Index. Each concern is discussed below:

The Consumer Price Index is one of several measures of the inflation rate reported by the government on a monthly or quarterly basis which are helpful in determining how much inflation is present in the economy. Other widely used measures of inflation are the Producer Price Index and the Gross National Product Implicit Price Deflator.

- a. Consumer Price Index (CPI) is a monthly measure of the market price of a "basket of goods" commonly purchased by a consumer. The CPI assumes that everyone spends the same percentage of their income in each of seven major categories (food, housing, transportation, medical, apparel, entertainment, and other). The priced goods are weighted to approximate the percentage a consumer might actually spend on them. The increase is assumed to be the inflation rate. The biggest flaw to this statistic is that it is inordinately influenced by new housing prices and the current level of mortgage rates. Since most households do not purchase or refinance their homes each month, the index exaggerates the amount of inflation.
- b. The Producer Price Index (PPI) is a measure of the price of raw materials for manufacturers of finished goods. Again, it is a weighted index and is heavily influenced by raw material prices to heavy industry. It has a tendency to reflect the inflation rate on a smaller and smaller percentage of the economy.

D.2.1(a)  
D.2.1(b)

- c. The Gross National Product Implicit Price Deflator (GNP Deflator) is a quarterly measure of inflation in the entire economy. The GNP Deflator measures the increase in cost only of goods actually produced. Because it is reported at the same time as monthly Gross National Product figures (quarterly), it is difficult to use as a short-term measure for planning purposes without keeping track of all the factors which make up the GNP on a monthly basis. One of the shortcomings of the GNP Deflator is that it only measures domestic economic activity and not imported items such as oil. Many authorities consider the GNP Deflator to be the most accurate measure of real inflation because, whereas the CPI is based on the budget of a typical urban family, the GNP Deflator is constructed from a market basket that includes every item that is included in the GNP--that is, every final good and service produced by the economy. Thus in addition to the prices of consumer goods, the GNP Deflator includes the prices of goods purchased by business, including government services. For purposes of adjusting the \$100,000,000 figure annually, the fact that the GNP Deflator is reported on a quarterly basis should pose no problem.

D. 2.1 (a)

D. 2.1 (b)

Because the GNP Deflator measures inflation over the entire domestic economy, it would seem to be the most appropriate inflation indicator for the proposed rules.

The section of the Federal Register entitled "Rationale for the Proposed Changes" states that the use of an inflation rate of twice that indicated by the CPI is based upon a comparison of net increases in decommissioning costs to the general inflation rate over the last several years. PSC believes that such comparisons, made during a period of unprecedented national inflation, produce distorted figures that are not necessarily indicative of long-term inflationary trends. There is no valid reason to expect decommissioning costs in future years to inflate at a rate that is higher than other economic goods and services as measured by the GNP Deflator. However, if decommissioning costs are found to differ significantly in the future from that approximated by the prescribed amount (adjusted for inflation by the GNP Deflator), then action can be taken to modify the regulation.

Based on the foregoing, PSC recommends that Section 50.33(k)(2) be revised as follows:

"...or a certification that financial assurance for decommissioning will be provided in an amount at least equal to \$100,000,000 (1984 dollars) adjusted annually for inflation in accordance with the following formula:

$$X = 100,000,000 + \frac{(100,000,000) (I_n - I)}{I}, \text{ where}$$

X = the adjusted decommissioning fund applicable to a calendar year after 1984

$I_n$  = U.S. Gross National Product Implicit Price Deflator at the end of the second quarter of the year immediately preceding the calendar year for which a calculation is being made.

I = U.S. Gross National Product Implicit Price Deflator at the end of the second quarter of 1984 (222.40)

D.2.1(b)

2. Section 50.33(k)(2)(i) - If a licensee submits a certification of financial assurance for decommissioning that utilizes the prepayment method, it is quite possible that as time elapses, the principal plus accumulated earnings in the segregated account will reach a level larger than is required to reflect the annual adjustment for inflation. This situation could arise because the proposed rule fails to recognize that the accumulated earnings will consist of an inflation adjustment component, a pure interest rate component and a premium-associated-with-risk component. It is recommended that the proposed rule for the prepayment method be revised to permit a licensee to withdraw the pure interest rate component and the premium-associated-with-risk component periodically from the trust, escrow account, etc.

D.3.3.4



**Wisconsin Electric** POWER COMPANY  
231 W. MICHIGAN, P.O. BOX 2046, MILWAUKEE, WI 53201

ACASE NUMBER PR-30,40,50 et al  
PROPOSED RULE (50 FR 5600) (134)

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July 12, 1985

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

VPNPD-85-217  
NRC-85-82

Mr. Samuel J. Chilk  
Secretary of the Commission  
U.S. NUCLEAR REGULATORY COMMISSION  
Washington, D.C. 20555

Attention: Docketing and Service Branch

Gentlemen:

COMMENTS ON PROPOSED RULE  
DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES

In the Federal Register, Vol. 50, No. 28, dated February 11, 1985, the U.S. Nuclear Regulatory Commission (NRC) published proposed amendments to its regulations that would set forth technical and financial criteria for decommissioning licensed facilities. The proposed amendments address decommissioning planning needs, timing, funding mechanisms, and environmental review requirements. Wisconsin Electric Power Company, owner and operator of the Point Beach Nuclear Plant, has reviewed the proposed amendments and offers the following comments.

We are pleased to note the recognition in the proposed amendment that an internal reserve is the most cost beneficial method of funding for decommissioning. We support this approach and believe that determination of the details of the exact accrual methodology is properly left to arrangement between the utility and the appropriate rate-regulating agency. As other industry commenters have pointed out, electric utilities are subject to a comprehensive regulatory process which provides reasonable assurance of adequate decommissioning funding. Certainly every funding method has at least some amount of associated risk; we believe that risk is minimized with the internal reserve option, yet has the advantage of maximizing benefit to the ratepayer. In fact, it has been wryly observed that the best investment for an external fund might be the utility itself! Any external fund, however, would not maximize benefit to the ratepayer. If we ascribe to the principle that beneficiaries should bear the costs, then we must also support the corollary that ratepayers are entitled to the benefits. Thus, an internal reserve is the logical method of choice.

D.3.2.1.1(b)

D.8.3.1

D.3.2.1.1(b)

Acknowledged by card ..... JUL 16 1985 *pd*

The straight line negative salvage method is the method currently used and preferred by Wisconsin Electric and many other utilities because it has a low cost to ratepayers while still providing adequate assurance that funds will be available when needed.

D.3.2.1.1(b)

We note a rather wide variety of opinion exists both within and without the industry regarding the cost of decommissioning. While the ease of using a generic figure is extremely attractive, we somewhat reluctantly conclude that the diversity of situations will not support such a simple approach. While we suspect that \$100 million per unit is too high, others have found such an amount too low for their circumstances. In the case of our own Point Beach Nuclear Plant, the extensive sharing of facilities between the two units and the likelihood of continued use of the site by our utility (which enhances the practicability of entombment) will tend to minimize decommissioning costs. A certain amount of this controversy is based on the desire to apply, at an excessive level of accuracy, the principle that beneficiaries should bear costs. However, attempting to account for virtually the last dollar of a project decades in the future is simply unreasonable in view of moving economies, developing technologies, and changing regulations. Furthermore, an attempt at overaccuracy fails to recognize that the body of beneficiaries will not change overnight at the time of decommissioning. Specifically, there is nothing inherently wrong in assuming that some correction for over or under accrual can appropriately be made in the first decade or so after cessation of operation. For these reasons, we recommend that site specific estimates be made without any generic amount established by regulation. Furthermore, we recommend that the regulation carefully avoid the explicit or implicit requirement of unwarranted accuracy. The level of detail required in specific studies should be left to arrangement between the utility and the rate-regulating agency. It is, after all, at this level that the collection of costs is approved and carried out. For the same or similar reasons, specific inflation indices and multipliers are inappropriate considerations for NRC regulation.

D.2.1(a)

In the Supplementary Information accompanying the proposal, new acronyms of SAFSTOR, DECON, and ENTOMB are proposed and defined but are not used in the proposed regulation. We consider the categories and their definitions appropriate, but we recommend that ordinary phraseology be used in lieu of acronyms and that these definitions be included in the regulation.

B.2.2

It appears likely at this time that the most cost effective method of decommissioning would entail a short period of either safe storage or entombment followed by further decontamination and/or removal. The regulation should clearly permit this approach without implication of need for immediate dismantlement. At the same time, changing technology, regulations, and political and environmental perceptions within the overall sphere of waste disposal suggest that the possibility of permanent entombment should not be disregarded or precluded.

B.4.1

B.5

Mr. Samuel J. Chilk

-3- July 12, 1985

As a result of the current level of interest in both waste disposal and decommissioning, there is an urgent need for regulatory definition of de minimis levels of radioactivity. We urge NRC to work toward this goal and note that there is no need to undertake the difficult task of establishing a single limit to apply to all situations. It would be acceptable to develop one set of limits for ordinary landfills, another set for decommissioning with continued site ownership, and another set for decommissioning with total site restoration. The establishment of such levels will have considerable impact on the costs of decommissioning.

E.1.1

At section 50.54, we recommend that NRC provide additional clarification such that approved changes to funding plans, cost estimates, and records cannot be construed as license amendments. The issue is not safety-related and should not be subject to the license amendment process.

C.7.2

D.4.4

In Section 50.82, an internal reserve would be converted to an external fund after cessation of operation. This would be an unnecessarily cumbersome requirement. A utility-licensee deemed sufficiently sound to manage an internal reserve during operation logically can and should continue to manage the reserve after cessation of operation. The timing and manner of payment of these funds is properly left to arrangement between the utility and the appropriate rate-regulating agency. We therefore recommend that the requirement for later establishment of an external fund be eliminated.

D.3.4

Thank you for this opportunity to comment. If you have any questions on our views, please feel free to contact us.

Very truly yours,



Vice President-Nuclear Power

C. W. Fay

EJL/jg

Copy to Public Service Commission  
of Wisconsin



PROPOSED RULE PR-30, 40, 50 et al.

DEPARTMENT OF THE ARMY (50 FR 5600)  
OFFICE OF THE ASSISTANT SECRETARY  
WASHINGTON, DC 20310

135

SECRET  
USNFC

12 JUL 1985

'85 JUL 18 A10:13

OFFICE OF THE ASSISTANT SECRETARY  
DOCKETING & SERVICE  
BRANCH

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
ATTN: Docketing and Service Branch  
Washington, D. C. 20555

Dear Sir:

This letter provides Department of the Army comments on the Nuclear Regulatory Commission's (NRC) proposed rule on Decommissioning Criteria for Nuclear Facilities, Title 10 CFR Parts 30, 40, 50, 51, 70 and 72, published in the Federal Register on February 11, 1985.

Proposed requirements for Federal agencies appear inconsistent with Federal statute. Proposed 10 CFR 30.35(e)(4), 40.36(d)(4), 50.33(k)(3)(iv), 70.25(e)(4), and 72.18(c)(4), as they apply to the Federal government, require a certification that the appropriate government entity will be guarantor of decommission funds. Since this certification would be required by applicants for licenses far in advance of decommissioning, it would in all likelihood subject the United States to an indefinite and uncertain liability, in contravention of the Anti-Deficiency Act, 31 USC 1341(a), and the Adequacy of Appropriations Act, 41 USC 11. Furthermore, no provision in either the Atomic Energy Act of 1954 or the Energy Reorganization Act of 1974 provides the NRC with express statutory authority to impose such a requirement on Federal agencies.

D.7

To avoid the problem of Federal agency obligation authority, the NRC should spearhead statutory relief or, establish a federal agency funding strategy. This NRC initiative might take one of two forms:

- o Funds for decommissioning could be included as part of the project appropriation request and then obligated and disbursed to an interest earning trust fund. Decommissioning funds could be disbursed from the fund as required even after the original appropriation had expired. This approach would require congressional approval.

JUL 19 1985  
Acknowledged by card.....

o Under the second approach, the NRC could sponsor an Executive Order similar to the Environmental Protection Agency sponsored Executive Order 12088. The NRC sponsored order could require all Federal agencies to ensure that sufficient funds are requested for the prevention, control and restoration of radioactive contaminated property caused by Federal agencies. The order should require each agency head to ensure that these funds are used exclusively for the prevention, control, and abatement of Federal agency radioactive contamination.

D.7

Each proposal requires the use of appropriated funds and recognizes the Army's responsibilities to provide for decommissioning. Accordingly, either proposal should satisfy the intent of the NRC proposed rule.

Restoration cost estimates (10 CFR 30.35) appear to be low. Army cost of cleaning up a small wooden maintenance building that burned while containing 9 curies of Pm-147 was \$300,000 in 1974. Based on that fire, clean-up involving radioactive material could cost between \$500,000 to several million dollars. Extensive contamination such as occurred at the US Atomic Energy Commission contractor plant at Weldon Spring, Missouri is estimated in excess of \$200,000,000. A laboratory complex with millicurie, unsealed, radioactive material operations could cost about \$700,000 to restore. If done by contract, \$100,000 minimum base cost would probably be needed to cover insurance, legal set aside, initial surveys and planning, with decontamination and disposal costs over and above that first \$100,000. The cost of restoring four igloos, which were contaminated at Seneca Army Depot by U.S. Atomic Energy Commission ore storage, will cost the Army \$300,000 as compared to \$1,000,000 if done by contract.

D. 6.3.1

We appreciate the opportunity to comment on this Proposed Rule and hope you incorporate these comments into the Final Rule.

Sincerely,

*Lewis D. Walker*

Lewis D. Walker  
Deputy for Environment, Safety  
and Occupational Health,  
OASA (I&L)



Minnesota  
Environmental Quality Board

100 Capitol Square Building  
550 Cedar Street  
St. Paul, Minnesota 55101  
Phone \_\_\_\_\_

PROJECT NUMBER  
PROPOSED RULE *PR-30, 40, 50 et al*  
*(50 FR 5600)*

*136*

SECRET  
ENRC

'85 AUG -1 A11:47

OFF  
600 T. 015 & 3E4  
BRANCH

July 30, 1985

Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Ref: Comment on NRC proposed rules for decommissioning nuclear  
Facilities. 50 FR 5600

Dear Secretary:

The enclosed are the remainder of Minnesota's comments on the above  
referenced rules. Comments by the Department of Public Service and  
the Department of Health have been sent to you previously. Enclosed  
are comments by the Pollution Control Agency.

Sincerely,

John P. Hynes  
Power Plant Siting Staff

AN EQUAL OPPORTUNITY EMPLOYER  
I KNOW

AUG - 1 1985

DEPARTMENT Pollution Control Agency

*Office Memorandum*TO: John Hynes  
State Planning Agency

DATE: June 14, 1985

FROM: *Deborah R. Pile*  
Deborah R. Pile, Director  
Office of Planning and Review

PHONE: 6-7799

SUBJECT: Proposed NRC Decommissioning Criteria for Nuclear Facilities

My staff has completed its review of the subject proposed rules and the draft comments from the Nuclear Information and Resource Service (NIRS). Generally, we find that we can concur with the NIRS draft comments. We also add the following observations:

1. The proposed reduction of environmental review requirements relating to decommissioning is unacceptable. The NRC proposes to replace the presently required environmental impact statement (EIS) with an environmental assessment. While an EIS has generally been prepared at the time of licensing of plants, licensing EIS's rarely contain more than a cursory discussion of decommissioning, and in any case would be outdated by the time the licensed facility is due for decommissioning. The draft generic EIS and any final generic EIS are not sufficient to address the site specific environmental impacts associated with the decommissioning of any specific facility. An EIS must be prepared for each facility at the time that decommissioning is anticipated.

F.1

2. The NRC proposes to address the development of appropriate residual radioactivity levels in other rulemaking. These rules apparently are expected to change very little from existing guidelines. We note that if the maximum residual radioactivity levels are reduced, the cost of decommissioning would be expected to increase accordingly. It would, therefore, appear appropriate to link the development of decommissioning criteria with the determination of residual radioactivity limits.

E.2

3. It is also emphasized that the determination of residual radioactivity limits must be accomplished in a timely fashion. The development of decommissioning plans and environmental review documents will necessarily be dependent upon availability of residual radioactivity limits, which will influence the selection of decommissioning strategies, environmental impacts, and financial expenses.

RICHARD H. BRYAN  
Governor

STATE OF NEVADA

ROBERT R. LOUX  
Director

BUCKET NUMBER  
PROPOSED RULE **PR-30,445 et al**  
**(50 FR 5600)** **(137)**



85 AUG 30 12:22

**NUCLEAR WASTE PROJECT OFFICE**

OFFICE OF THE GOVERNOR  
Capitol Complex  
Carson City, Nevada 89710  
(702) 885-3744

EXPRESS MAIL

May 10, 1985

Samuel J. Chilk, Secretary  
Nuclear Regulatory Commission  
Matomic Building  
1717 H Street, N.W.  
Washington, D.C. 20555

Dear Secretary Chilk:

Enclosed please find comments of the State of Nevada regarding the Nuclear Regulatory Commission's proposed rule on Decommissioning Criteria for Nuclear Facilities, 50 FR 5600.

Should you have any questions, do not hesitate to contact me.

Sincerely,

Robert R. Loux  
Director

RRL/gjb

Enclosure

Acknowledged by card SEP 3 1985 *fl*

COMMENTS ON NRC'S PROPOSED RULE ON DECOMMISSIONING  
CRITERIA FOR NUCLEAR FACILITIES, 50 FR 5600

The proposed amendments to 10 CFR parts 30, 40, 50, 51, 70 and 72 regarding the decommissioning criteria for nuclear facilities presupposes that any and all materials in facilities subject to those parts will have removed any spent fuel or other material constituting high-level radioactive waste from those facilities by the time that operation of the facility is terminated and decommissioning is therefore appropriate. Any environmental impact statement prepared at the time of licensing at a particular facility, particularly those licensed under part 50, would have analyzed the environmental impacts of decommissioning on that presupposition.

The passage of the Nuclear Waste Policy Act, providing that title to all high-level radioactive waste existing at power reactors would transfer to the United States on a date certain seemed to have confirmed the presupposition upon which decommissioning impacts were originally analyzed and on which NRC's proposed rule is based. Hopefully, the assumption that a federal repository or other facilities will be available in time to allow removal of all high-level radioactive waste from licensed facilities by their date of natural decommissioning will become reality. However, the Department of Energy has been unsuccessful at meeting the early statutory deadlines of the Nuclear Waste Policy Act. It is conceivable that the federal government will not have a nuclear waste repository or other facilities capable of taking actual possession of the radioactive waste in place when title transfers pursuant to contracts entered as a consequence of the Nuclear Waste Policy Act.

F.3

The Commission's assumptions underlying the proposed rule are reasonable and fair. The basic construct for dealing with the decommissioning problem, requirement for authorized termination of an operating license, is a sensible one in which to raise the appropriate decommissioning issues. However, the rule should be clear that a licensee should not be entitled to an authorized termination of an operating license until all materials which constitute high-level radioactive waste have been physically removed from the licensee's premises. In other words, a licensee should not be able to compel the federal government's physical acceptance of its spent fuel or high-level radioactive waste if the government does not yet have the facilities available to house it just because the licensee wants to terminate its license and decommission its facility.

The Commission has appropriately identified that decommissioning involves the major question of reduction of radioactive waste volumes. We presume that the waste volume discussed would all be low-level radioactive waste, (see pages 5603, 5605, 5610). The Commission should also consider, however, the high-level radioactive waste issues raised by decommissioning if the facilities contemplated by the Nuclear Waste Policy Act are either not yet in operation or have insufficient capacity to accommodate the high-level radioactive waste produced by the facilities about to be decommissioned.

Notwithstanding the Commission's logical discussion at page 5610 that environmental impact statements prepared in connection of the issuance of the construction permit and operating license for a facility have already considered the environmental impacts occurring at decommissioning, no NRC decision which permits termination of license and decommissioning prior to the existence of a high-level nuclear waste repository other federal facility capable of accepting physical possession of a facilities high-level nuclear waste should be taken without

G.1

B.3.1

B.4.2

H.1.1.1

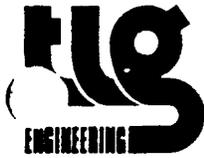
F.3

some environmental analysis of the altered circumstances which could not have been considered at the time the original environmental statement was prepared.

F.3

Nevada agrees with the Commission's apparent understanding that the concept of decommissioning does not apply to repositories licensed under 10 CFR 60 in the same way as it does to other facilities. No amendment is proposed to part 60 by this proposal. However, we would caution the Commission that § 112(b)(iii) of the Nuclear Waste Policy Act contemplates that 10 CFR 60 will eventually include "technical requirements and criteria that [NRC] will apply . . . in approving or disapproving - (iii) applications for authorization for closure and decommissioning of such repositories." The general approach taken by the NRC in developing standards and procedures within part 60, namely looking to other parts for general provisions applicable to that part, should not be used in contemplating which approach to use for the deinstitutionalization of monitoring and surveillance of part 60 facilities.

G.7



DOCKET NUMBER  
PROPOSED RULE PR-30-40, 50 et al (139)  
(50 FR 5600)

DOCKETED  
September 2, 1985 USNRC  
N11-25-GC-06

85 SEP 10 10:09

Mr. Samuel J. Chilk  
Secretary of the Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Attention: Docketing and Service Branch

Subject: Comments on the Decommissioning Criteria for Nuclear  
Facilities: Proposed Rule - Federal Register Volume  
50, No.28 (February 11, 1985)

Gentlemen:

I have reviewed the Proposed Rules in detail and offer the following comments:

**Financial Assurance and Preliminary Planning: Pgs 5602 & 5604**  
I do not agree with the Commission's proposed endorsement of a funding level at \$100 million (in 1984). For large power reactors (greater than approximately 200 MWe), site-specific estimates prepared by TLG Engineering, Inc. and other independent consultants indicate decommissioning costs (removal of radioactivity) are in the range of \$101 to \$142 million in 1985 without contingency, or \$126 to \$178 million with 25% contingency. Demolition of the remaining non-radioactive structures and systems add another \$30 to \$50 million, or \$38 to \$63 million with 25% contingency. The overall cost range is \$164 to \$241 million in 1985 dollars. State public utility commissions predictably have adopted the \$100 million estimate as the upper limit of allowable costs for decommissioning.

D.1.1.1

In the Niagara Mohawk Power Corporation case before the New York State Public Service Commission (Case 29070 1985), TLG Engineering, Inc. prepared a detailed component and structure cost estimate on a site-specific basis at a cost of \$229 million for complete removal, with 25% contingency in 1985 dollars. Dr. Harvey Prins of the PSC staff recommended only \$100 million be allowed for the decommissioning of the 1080 MWe NMP-2 reactor. Therefore the NRC's endorsement of the \$100 million estimate is counter-productive to providing adequate funds for safe decommissioning. I recommend the certification amount be deleted from the Final Rule.

D.2.1(a)

**Financial Assurance: Pg 5602**  
The proposed adjustment factor of two times the Consumer Price Index (CPI) is inappropriate for updating decommissioning costs. Factors that affect decommissioning cost are escalating at rates far exceeding the CPI. I recommend the commission provide guidance to group the costs into the categories of labor, equipment and materials, shipping and burial. Appropriate plant indices may then be applied to each

D.2.1(b)

SEP 11 1985  
Acknowledged by card. *pd*

U.S. FEDERAL GOVERNMENT



cost element using Handy-Whitman for labor and materials, published shipping tariffs, and published burial rates.

D.2.1(b)

**Financial Assurance: Pg 5602**

I disagree that generic studies and specifically the PNL studies should be used to estimate decommissioning costs. Generic studies fail to account for site-specific differences at particular plants, and attempts to adjust for such differences are inadequate and irreconcilable with site-specific studies. Generic studies do not account for the following factors.

1. Site labor costs - management and crew
2. Shipping distances and routing difficulties
3. Regional compact burial costs
4. Facilities available (rail siding, barge docks or truck roadway restrictions)
5. Site factors - seismicity, hydrology, site restoration requirements
6. Site structures - cooling towers, ocean cooling, tsunami walls, stacks
7. Plant specific factors - PWR: Number and type of steam generators - containment design - free standing or steel-lined concrete, steel reinforced or pretensioned
8. Plant specific factors - BWR - Mark I, II or III reactor designs - degree of contamination in secondary systems
9. A/E design differences
10. Plant modifications and backfits
11. Errors in generic vessel and internals radioactive inventory - curies and weights
12. Allowable exposures to workers
13. Two-shift vs one-shift operations
14. Utility and Decommissioning Operations Contractor (DOC) staffing levels
15. Removal of non-radioactive components and structures to gain access to radioactive components and structures
16. Sorting and segregation of radioactive wastes
17. Waste volume reduction equipment available on-site.

D.2.1(a)

These and other more detailed differences are usually not accounted for adequately in generic studies. Therefore, generic studies should not be used for cost estimating.

I trust these comments are constructive. If you have any questions, please call me.

Sincerely,

*Thomas S. LaGuardia*  
Thomas S. LaGuardia, PE  
President

TSL:lp

**NIAGARA  
MOHAWK**

JULY NUMBER  
PROPOSED RULE PR-30, 40, 50 et al  
(50 FR 5600) (139)

NIAGARA MOHAWK POWER CORPORATION / 300 ERIE BOULEVARD WEST SYRACUSE N.Y. 13202 / TELEPHONE (315) 474-1511

October 2, 1985

10:50 AM '85

600-1-139

Honorable Samuel J. Chilk  
Secretary  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Att: Docketing and Service Branch

Re: Proposed Amendments to 10CFR, Parts 30, 40, 50, 51, 70 and 72,  
Decommissioning Criteria for Nuclear Facilities

Dear Mr. Chilk:

On February 11, 1985, the Nuclear Regulatory Commission published for public comment a series of proposed amendments to its regulations concerning the decommissioning of nuclear facilities. 50 Fed. Reg. 5600. The notice requested that interested parties submit comments by May 13, 1985. On May 30, 1985, the Commission extended the comment period to July 12, 1985. 50 Fed. Reg. 23025.

On June 20, 1985, the Atomic Industrial Forum's Subcommittee on Decommissioning submitted comments on the proposed rule. The proposed rule requires inter alia that Part 50 licensees provide to the Commission either a site-specific decommissioning funding plan or a certification that financial assurance for decommissioning has been provided in an amount at least equal to \$100,000,000 (1984 dollars). The AIF, in their comments, indicated that it was their judgment that the \$100,000,000 specified in the proposed rule was not representative of the decommissioning cost for most of today's nuclear power plants. The AIF noted that utility regulators have often relied heavily on NRC-sanctioned generic cost estimates and, accordingly, the inclusion of an inappropriately low generic cost could be misleading and counterproductive to the NRC's objective of adequate financial assurance for decommissioning.

While we recognize that the official comment period has expired, we are writing to underscore the comments submitted by the AIF because of our own experience regarding decommissioning funding in a recent rate case proceeding before the New York State Public Service Commission.

D.2.1(a)

~~Approved by~~ OCT 11 1985 *ph*

J-548

Niagara Mohawk Power Corporation's experience in this rate proceeding has been consistent with the AIF's prediction of utility regulator behavior. The New York Public Service Commission's Staff has recommended to the Public Service Commission that the site-specific cost estimate prepared by Niagara Mohawk Power Corporation for Nine Mile Point Unit 2 decommissioning costs be disregarded, and that the Commission use, instead of the site-specific cost estimate, the figure of \$100,000,000 as contained in the proposed rule. As a result, Niagara Mohawk faces a potential reduction in funds available for decommissioning.

D.2.1(a)

Based on our experience with the New York State Public Service Commission, we strongly urge the Nuclear Regulatory Commission to favorably consider the comments of the Atomic Industrial Forum. If the Commission feels that it is necessary to specify a precise fund amount in the proposed rule, we urge that the fund amount be established at an appropriately high level to provide a conservative level of funding for decommissioning. Such a figure will encourage utilities to conduct site-specific studies for their units, and will assure that the NRC's objective of providing financial assurance that nuclear facilities are properly decommissioned will be achieved.

D.2.1(b)

While the official comment period has expired, we urge your consideration of our brief comments relating to this matter which occurred subsequent to the close of the comment period but which provides insight into the impact the proposed regulations will have on utility regulators.

G.8

Very truly yours,



Adam Shaffer  
Assistant Controller

AS/GDW/gma



DOCKET NUMBER PR-30,40,50 et al  
PROPOSED RULE (58 FR 5600) (140)

Department of Energy

LABOR & INDUSTRIES BUILDING, ROOM 102, SALEM, OREGON 97310-0831 PHONE 378-4040

DOCKETED USAFAC  
OCT 8 1985  
FREE 1-800-221-8035  
P12:18

October 3, 1985

OFFICE OF RECORDS  
DOCKET SERVICE

Secretary of Commission  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

ATTN: Docketing and Service Branch

Dear Sir:

We reviewed your proposed rule on nuclear facility decommissioning. It was received at an opportune time in that the State of Oregon had already commenced a public review of issues surrounding the eventual decommissioning of the Trojan Nuclear Power Plant. Unfortunately, the review schedule did not permit us to submit comments to you before the comment period expiration date. We contacted Keith Steyer of NRC, telling him we still intended to submit comments. He said they would be considered but any action taken in response to them depended upon the status of the rule finalization process.

G.8

We recognize that many comments were received in response to the proposed decommissioning rule. If we have identified an issue that has not been previously identified, we request that it be considered for current or future rule revision.

The assistance NRC has given us during our review is greatly appreciated. We also appreciate the opportunity to participate in your rule making process. Please let us know if we can be of further assistance.

Sincerely,

*M. W. Alsworth*

M. W. Alsworth  
Manager of Reactor Safety  
Siting and Regulation Division

MWA:ja  
266-Letter(d1,f1)

Attachment

ACKNOWLEDGED BY WORD OCT 08 1985 PR

The Oregon Department of Energy is an Equal Opportunity Employer

Comments On Proposed  
NRC Decommissioning Rules

The following are comments resulting from the review of the NRC proposed decommissioning rule:

Periodic Reviews -

The proposed rule states the requirement of developing a decommissioning plan within two years of rule adoption. The decommissioning funding level and method will be established and justified in the plan. Once the plan is approved, there is no requirement for reviewing it until 5 years prior to expiration of the plant operating license. The following concerns have been identified with this part of the rule.

1. The cost of decommissioning a plant may rise faster than the inflation rate due to such factors as increased regulatory requirements, higher radioactive waste disposal costs due to closure of waste disposal sites, and reduction of personal exposure limits.
2. The decommissioning funding level was determined by using data gathered as laboratories and small experimental reactors were decommissioned. This data may not accurately reflect the costs involved in full scale commercial nuclear plant decommissioning.
3. The method of determining the funding level (ie. a base amount adjusted by multiplying it by a factor equal to twice the inflation rate) is inappropriate. This level may far exceed the increased cost of decommissioning.
4. In the case of Trojan, decommissioning work will not commence for more than 25 years. It is impossible to determine and reflect the effects of future regulations, politics, and economic conditions in costs and planning.

D.4.3

D.1.1.1

D.2.1(a)

A better way to handle planning is to include a periodic 5 year review of the plan. As experience is gained in the actual decommissioning of full sized commercial nuclear plants, the plan could be changed accordingly. These changes would have to be reviewed and approved by the NRC. The public and utility company would benefit with this arrangement because:

1. The stock holder would be protected against having to pick up additional decommissioning costs should the estimate turn out to be low and the rate-setting authority refuse an increase in utility rates to compensate.
2. The rate payer would be protected against large rate increases in the last five years should the estimate turn out to be low.
3. The persons who used the power generated by the plant would be the ones who actually paid the costs of decommissioning the plant.
4. The company would be able to gradually compensate for changes in planning rather than make drastic changes in the last five years.

D.2.1(a)

D.4.3

D.8.3.1

Utility Financial Stability -

The proposed rule allows a utility company to decide, with NRC approval, the method it will use to accumulate decommissioning funding. The supplement accompanying the proposed rule stated some small utilities may not use the internal reserve method because their only asset is the plant they will decommission. Once the plant is shut down they will have no assets to issue bonds against.

D.3.2.1.1(b)

The proposed rule states that companies with larger asset bases may use the internal reserve method of accumulating decommissioning funding. They have several levels of financial security which makes this a safe funding method. Should the company experience financial difficulties they could pay for decommissioning costs by either:

1. Issuing bonds on other company assets.
2. Diverting stock holder dividends, or
3. Raise electrical rates.

However, should the utility company be forced into bankruptcy it may experience difficulty issuing bonds. Since the ratepayer will have already paid for decommissioning once, the rate-setting authority would be very reluctant to grant a rate increase to pay for it again. Furthermore, if in a bankrupt condition, the company would likely have no stockholder dividends to draw upon. It would be dependent solely upon the sale of its assets to raise decommissioning funding.

D.3.2.1.1(b)

Should a company adopt the internal reserve funding method, it should include an analysis of its financial health in the periodic decommissioning plan reviews. The ability to fund decommissioning should be substantiated to the NRC. If it is found that funding is in jeopardy or not being accumulated at an acceptable rate, the company should pursue the acquisition of bonding or switch to the external funding method.

Those companies using the external funding method should also substantiate to NRC that the fund is growing at an acceptable rate. In addition, proper controls should be placed on the fund to ensure it is not used for any other purpose.

Accident Cleanup Costs -

Should an accident occur at a commercial nuclear plant the cleanup costs may be intertwined with the decommissioning costs. This is especially true if the plant is never restarted. However the proposed NRC rule does not address this complication.

A good example of this is the Three Mile Island accident. Plant cleanup costs are estimated to exceed \$1 billion. The company was insured to about \$300 million. The shortfall in insurance may hinder the company from paying for decommissioning since the plant, in all likelihood, will not be allowed to restart. This experience should be evaluated to determine what insurance levels are needed for protection against reactor accidents.

D.1.3

SPENT FUEL DISPOSITION -

The State of Oregon is concerned about the eventual disposition of spent fuel at Trojan. The 1985 Oregon legislature requested the Oregon Department of Energy and Portland General Electric (PGE) to work with the NRC and USDOE to achieve the following:

1. The goal that all spent fuel is removed from the Trojan facility before the expiration of the plant operating license.
2. Ensure that PGE is held responsible for proper temporary storage of spent fuel as long as it is at the Trojan site.

G.23

We recognize that NRC regulation 10 CFR 50.54(bb) places the responsibility for proper storage and maintenance of spent fuel on the operator as long as the spent fuel is at the plant. These requirements should be referenced in the proposed decommissioning rule.

USDOE's plans for receiving spent fuel does not accommodate its expeditious removal at the end of plant operation. This may cause a considerable delay in the start of plant decommissioning. NRC should encourage USDOE to make every effort to have spent fuel removed as soon as possible after final plant shutdown. This is essential if the plant is to be decommissioned in a timely manner.

G.24

MWA/ma  
83-Sitmisc  
9/12/85

PROPOSED RULE PK-30,40,50 etal (191)  
(50 FR 5600)

STATE OF NEW YORK DEPARTMENT OF PUBLIC SERVICE

THREE EMPIRE STATE PLAZA, ALBANY 12223

PUBLIC SERVICE COMMISSION

PAUL L. GIOIA  
Chairman  
  
EDWARD P. LARKIN  
CARMEL CARRINGTON MARR  
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ANNE F. MEAD  
ROSEMARY S. POOLER  
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85 OCT 17 AM 11:42

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

DAVID E. BLABEY  
Counsel  
  
JOHN J. KELLIHER  
Secretary

October 11, 1985

Mr. Samuel J. Chilk  
Secretary of the Commission  
US Nuclear Regulatory Commission  
Washington, DC 20555

Attention: Docketing and Service Branch

Subject: Comments on the Decommissioning Criteria for Nuclear  
Facilities: Proposed Rule - Federal Register Volume 50,  
No. 28 (February 11, 1985)

Gentlemen:

These comments on the subject proposed rule are submitted in my capacity as an expert staff witness for the New York State Public Service Commission; the comments are my own and do not necessarily reflect the opinions or policies of the Commission.

Through the discovery process, I obtained a copy of a letter from Thomas S. LaGuardia dated September 2, 1985 (attached). Although the comment period for the Proposed Rule has expired, I am enclosing the hearing record dealing with decommissioning in the case referred to by Mr. LaGuardia for your consideration.

The New York State Public Service Commission will not rule on this matter for many month, and many briefs will proceed the ruling.

Sincerely,

HARVEY R. PRINS  
Nuclear Power Generation Planner  
System Planning Section  
Power Division

HRP:jlh  
Enc.  
cc: F. Haag  
W. Shaffer

OCT 17 1985  
Acknowledged by card.....

1 previously marked for identification, were received in  
2 evidence.)

3 JUDGE MATIAS: Who's the next witness,  
4 Miss Curtin?

5 MR. VAN RYN: Mr. Prins, I believe.

6 JUDGE MATIAS: Mr. Prins, would you raise  
7 your right hand?

8  
9 H A R V E Y R. P R I N S, having been called as a  
10 witness, being first duly sworn by the Administrative  
11 Law Judge, was examined and testified as follows:

12 JUDGE MATIAS: State your full name and  
13 address, please, Mr. Prins.

14 THE WITNESS: My name is Harvey Raymond  
15 Prins. My address is Three Empire State Plaza, Albany,  
16 New York.

17 JUDGE MATIAS: Mr. Van Ryn, is this your  
18 witness?

19 MR. VAN RYN: Yes.

20 JUDGE MATIAS: All right.

21 DIRECT EXAMINATION

22 BY MR. VAN RYN:

23 Q Dr. Prins, I show you a document entitled "Prepared  
Testimony of Harvey R. Prins" consisting of nine pages

1 and ask if it was prepared by you or under your  
2 direction?

3 A Yes, it was.

4 Q Do you have any corrections to make to this document?

5 A No, I do not.

6 Q Do you adopt this document as your prefiled testimony  
7 in this proceeding?

8 A Yes, I do.

9 MR. VAN RYN: Your Honor, I ask that  
10 Mr. Prins' testimony be copied into the record as if  
11 given orally.

12 JUDGE MATIAS: Objections?

13 (No response)

14 JUDGE MATIAS: Hearing none, Mr. Reporter,  
15 take in as though given orally the prepared testimony  
16 of Harvey R. Prins.

17 (Whereupon the following is the prefiled  
18 testimony of Witness Harvey R. Prins in the above-  
19 entitled matter, consisting of nine pages:)

20

21

22

23

1       BEFORE THE  
2       STATE OF NEW YORK  
3       PUBLIC SERVICE COMMISSION

2324

4

5                   In the Matter of  
6                   Cases 29069 & 29070

7       Proceeding on the motion of the Commission as to the rates,  
8       charges, rules and regulations of Niagara Mohawk Power  
9       Corporation for electric and street lighting services.

10

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11                   Prepared Testimony of  
12                   Harvey R. Prins  
13                   Nuclear Power Generation Planner IV  
14                   System Planning Section  
15                   Power Division  
16                   Department of Public Service  
17                   Three Empire State Plaza  
18                   Albany, New York 12223

- 16       Q. Please state your name and business address.
- 17       A. My name is Harvey R. Prins and my business address is  
18       New York State Department of Public Service, Three  
19       Empire State Plaza, Albany, New York 12223.
- 20       Q. What is your position with the Department of Public  
21       Service?
- 22       A. I am a Nuclear Generation Planner in the System  
23       Planning Section of the Power Division.

24

1 Q. Please summarize your responsibilities in that  
2 position.

3 A. At the Department of Public Service, my  
4 responsibilities are in the areas where radiological  
5 factors could have an impact on nuclear power plant  
6 operation. These areas include:

- 7 (a) outage due to radiation levels;  
8 (b) low-level waste disposal;  
9 (c) spent fuel storage and disposal;  
10 (d) emergency planning; and  
11 (e) decommissioning of nuclear facilities.

12 I also represent the Department at interagency  
13 meetings.

14 Q. What is your educational background?

15 A. I received a Bachelor of Science degree in Civil  
16 Engineering from Newark College of Engineering. I  
17 received a Master of Science and Doctor of Engineering  
18 degree in Environmental Engineering from Rensselaer  
19 Polytechnic Institute. My education at RPI includes  
20 20 graduate credits in Nuclear Engineering.

21 Q. What are your professional qualifications?

22 A. I am a Professional Engineer in the State of New York.  
23 I am also certified in Health Physics by the American  
24 Board of Health Physics.

25 Q. Briefly summarize your professional experience.

1       A. I have three years' experience in teaching  
2       Radiological Health at Lowell Technologies Institute  
3       and the University of Michigan.

4               For nine years, I was a Nuclear Engineer with  
5       the New York Department of Environmental Conservation.  
6       My duties there were: (1) to keep informed of the  
7       developments in the nuclear industry and evaluate  
8       their impact on the environment; (2) regulate  
9       discharges of radioactive materials into the  
10      environment; (3) formulate and implement radiological  
11      surveillance programs to monitor discharges and  
12      environmental levels of radioactivity; (4) perform  
13      surveillance of the West Valley burial site and  
14      recommend corrective action in the site operation  
15      where necessary.

16              For the past five years, I have been with the  
17      Department of Public Service.

18      Q. Have you testified in other rate cases before this  
19      Commission?

20      A. Yes, I testified in Case 28211, Consolidated Edison  
21      Company; in Case 28225, Niagara Mohawk Power  
22      Corporation; and in Cases 28313-6, Rochester Gas and  
23      Electric Corporation. I also submitted testimony in  
24      Case 28553 and Case 29029, Long Island Lighting  
25      Company.

- 1 Q. What is the purpose of your testimony?
- 2 A. The purpose of my testimony is (1) to review the basic  
3 studies setting forth technology safety and costs for  
4 boiling water nuclear power reactor decommissioning;  
5 (2) to review the studies performed for Nine Mile  
6 Point Two decommissioning cost and (3) to present a  
7 current cost estimate for Nine Mile Point Two.
- 8 Q. What are the basic studies on the decommissioning  
9 costs associated with boiling water nuclear power  
10 reactors?
- 11 A. In the United States, there are two basic generic  
12 studies. The first was sponsored by the Atomic  
13 Industrial Forum and done by Nuclear Energy Services  
14 (the AIF-1 study). The authors are William J. Manion  
15 and Thomas S. LaGuardia. The study was published in  
16 November 1976 and included an analysis of a 1,160 MWe  
17 boiling water reactor (AIF/NESP-009). The cost for  
18 the immediate dismantlement mode of decommissioning  
19 (the method previously approved by the Commission) was  
20 \$31.2 million in 1975 dollars.
- 21 The second study was sponsored by the Nuclear  
22 Regulatory Commission and done by Battelle Pacific  
23 Northwest Laboratory (the Battelle Study I). The  
24 authors are H.D. Oak, G.M. Holter, W.E. Kennedy, Jr.  
25 and G.J. Konzels (NUREG/CR-0672). The study was

1 published in June 1980. The analysis was for a 1,155  
2 MWe boiling water reactor, the Battelle reference  
3 plant. The cost for the immediate dismantling mode of  
4 decommissioning was \$43.6 million in 1978 dollars.  
5 Both of these studies were comprehensive, widely  
6 distributed and received extensive peer review from  
7 the interested scientific and engineering community.

8 Q. Were these studies ever updated?

9 A. Yes, a study sponsored by the Atomic Industrial Forum  
10 and done by Stone and Webster Engineering Corporation  
11 was published in May 1981 (AIF/NESP-021) (AIF-2  
12 study). This study updated the cost of  
13 decommissioning to 1980 dollars for both the AIF and  
14 Battelle studies. For the AIF reference plant, the  
15 cost was \$44.79 million and for the Battelle reference  
16 plant, \$56.27 million.

17 These studies are reasonably consistent with each  
18 other and the differences between them have been  
19 explained.

20 Q. What is the most recent study?

21 A. A study sponsored by the Electric Power Research  
22 Institute, and done by Battelle Pacific Northwest  
23 Laboratories, was published in May 1985. The title  
24 is, "Updated Cost for Decommissioning Nuclear Power  
25 Facilities" (EPRI NP-4012) (Battelle-2 study). The

1 authors are R.I. Smith, G.J. Konzels, E.S. Murphy and  
2 E.K. Elder. This group includes some of the authors  
3 who performed the original Battelle 1 study. They  
4 took into account comments received on the original,  
5 the rise in cost and changes in the regulatory  
6 environment that have occurred since 1978. Their cost  
7 estimates for the immediate dismantlement mode of  
8 decommissioning in 1984 dollars was \$97.2 million if  
9 done with utility staffing, or \$119.7 million if done  
10 with contractor staffing. These costs include a 25%  
11 contingency factor.

12 Q. What use should be made of these generic studies?

13 A. Any decommissioning study should be consistent with  
14 the findings of these generic studies or the  
15 differences should be explained in detail.

16 Q. What decommissioning cost estimates have been made for  
17 Nine Mile Two?

18 A. In the hearing before the State of New York Public  
19 Service Commission (Case 28059), in December 1981,  
20 concerning the continued construction of Nine Mile  
21 Two, company witness Thomas LaGuardia presented  
22 testimony. He estimated the cost for decommissioning  
23 Nine Mile Two at \$86.2 million in 1978 dollars. This  
24 amount includes a 25% contingency. His estimate was  
25 based on a study done for Fermi Two (the Fermi study),

D.1.1.1  
D.2.1(c)

1 a 1,100 MWe boiling water reactor, with adjustments  
2 made for Nine Mile Two-specific features.

3 In the current rate case, the company has  
4 submitted a study done by the NUS Corporation in  
5 September 1982 (Exhibit 106A and 106B) (the NUS  
6 study). This study is based on a detailed study of  
7 Diablo Canyon 1 and 2, Westinghouse Pressurized Water  
8 Reactors (PWR). There were adjustments made using  
9 data from the Battelle study and data from Nine Mile  
10 Two. The cost is estimated to be \$154 million in 1982  
11 dollars. This figure includes a 25% contingency  
12 allowance.

13 Q. Does the method used in the NUS study produce a  
14 reasonable estimate for Nine Mile Two decommissioning  
15 cost?

16 A. No, using a PWR data base to obtain an estimate for a  
17 Boiling Water Reactor (BWR) is an inappropriate  
18 method. The Niagara Mohawk staff apparently agrees  
19 with this conclusion (SM475). The reference plant for  
20 the Battelle studies closely resembles Nine Mile Two;  
21 therefore, using a PWR data base when the very  
22 detailed study of Battelle was available, produces  
23 unnecessary inaccuracies. The reason Niagara Mohawk had  
24 the NUS study performed is also unexplained,  
25 especially since the study they presented in

D.1.1.1  
D.2.1(c)

1 Case 28059 was based on the Fermi II plant which more  
2 closely resembles Nine Mile Two.

3 Q. In view of the above history, what amount would you  
4 recommend for the decommissioning cost of Nine Mile  
5 Two?

6 A. I would recommend \$100 million in 1984 dollars. This  
7 is the amount stated in the Nuclear Regulatory  
8 Commission's proposed rules on "Decommissioning  
9 Criteria for Nuclear Facilities" (Feb. 11, 1985,  
10 Federal Register, Vol. 50, page 5602).

11 The NRC's proposed rules have been developed in  
12 response to a petition for rulemaking (PRM-50-22)  
13 concerning decommissioning financial assurance,  
14 initially filed by the Public Interest Research Group  
15 on July 5, 1977. The topic of decommissioning has  
16 received much study by the NRC and other interested  
17 parties. The NRC sponsored the Battelle studies as a  
18 basis for its rulemaking.

19 The Electric Power Research Institute states  
20 that the estimates developed in the Battelle-2 Study  
21 are consistent with the \$100 million level on which  
22 NRC based its ruling.

23 The \$100 million derived in the very timely  
24 study, done by a competent group and endorsed by EPRI  
25 includes a 25% contingency factor. This contingency

D.1.1.1

D.2.1(c)

1 factor should be sufficient to cover any differences  
2 between the reference plant and Nine Mile Two.

D.1.1.1  
D.2.1(c)

3 Q. Does this conclude your testimony?

4 A. Yes.

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1 JUDGE MATIAS: Further direct?

2 MR. VAN RYN: The witness is available  
3 for cross-examination.

4 JUDGE MATIAS: All right. Mr. Dax?

5 MR. DAX: Thank you, your Honor.

6 CROSS-EXAMINATION

7 BY MR. DAX:

8 Q Dr. Prins, have you ever participated in decommissioning  
9 a nuclear power plant?

10 A No, I have not.

11 Q Have you conducted a study of the engineering and  
12 funding requirements involved in decommissioning a  
13 nuclear power plant?

14 A No, I have not.

15 Q Have you ever performed or supervised construction work  
16 in a nuclear power plant?

17 A No, I have not. ..

18 Q You recommended that an estimate of \$100 million in  
19 1984 dollars be used for the decommissioning of Nine  
20 Mile 2 for purposes of rate year revenue requirements;  
21 is that correct?

22 A That is correct.

23 Q And your reference is the proposed rules that are  
currently pending before the NRC; is that correct?

- 1 A That is correct.
- 2 Q And the rules, as I understand them -- and tell me if  
3 your understanding differs -- provide at this point --  
4 and they are proposed rules -- for giving the utilities  
5 the option of certifying that they have sufficient  
6 internal financing to assure decommissioning at the end  
7 of the life of the nuclear facility based on either a  
8 site-specific study or using a cost estimate of the  
9 \$100 million in 1984 dollars? Is that a correct under-  
10 standing of the rules?
- 11 A I believe that's the way it was published in the Federal  
12 Register.
- 13 The discussion behind that was that the  
14 utility could either assure that they have the \$100  
15 million or justify another figure, and the other figure  
16 -- since the NRC is concerned that the utility has  
17 adequate funds, that they have surplus funds, the NRC  
18 would not be concerned.
- 19 Q Right. And the NRC -- this other option would be based  
20 on the adequacy of the funds, that would be judged by  
21 the NRC based upon the site-specific study that would  
22 have to be presented by the utility; is that correct?
- 23 A In my understanding, there were quite a few hearings  
before that, before the rule was published. But in some

D.2.1(b)  
D.2.1(c)

1 of the staff meetings that the NRC staff was briefing  
2 the commissioners on, they said to either assure  
3 \$100 million or justify another figure.

4 Now, when they had that option, it was  
5 implied that the utility wanted to justify a lesser  
6 figure, they would need a site-specific study.

7 Q And you're saying that the NRC wouldn't be concerned if  
8 they were trying to justify a figure larger than \$100  
9 million? Is that what you're telling me?

10 A That would be my interpretation of the process that went  
11 through in the rule-making proceeding.

12 Q But the rules as published in the register don't make  
13 that explicit, do they?

14 A They don't make that explicit, no.

15 Q Now, are you sponsoring the \$100 million as your estimate  
16 of what it will cost to decommission Nine Mile 2 at the  
17 end of its life?

18 A Yes, I am.

19 Q That is your estimate? You're not simply recommending  
20 that the NRC's proposed prescription of \$100 million be  
21 adopted? You're actually saying that that's a good  
22 estimate for Nine Mile 2?

23 A No. The \$100 million that the NRC has proposed is  
consistent with the Battelle studies and the EPRI review

D.2.1(b)

D.2.1(c)

1 of the Battelle studies, and the Battelle study was  
2 based on the WPS II plant, Washington power plant number  
3 two, which is essentially identical to Nine Mile 2, so  
4 that on that basis I would propose that \$100 million.

5 Q And have you conducted a study or any kind of  
6 verification of the validity of that \$100 million  
7 estimate for Nine Mile 2 or is your conclusion based  
8 upon your knowledge of what it was -- what the NRC's  
9 figure was based on that you just described to me?

10 A No. I did a study to compare the two plants and the  
11 nuclear steam supply parts of the plant are essentially  
12 identical.

13 Now, there is a difference in the design  
14 earthquake for Nine Mile 2, I think --

15 (Pause)

16 A OK. The seismic design for Nine Mile Point 2 was 0.15G  
17 and the seismic design for the Washington II plant is  
18 0.26G. That would indicate that the Washington II  
19 plant would be more ruggedly designed.

20 (Continued on following page.)  
21  
22  
23

D.2.1(b)  
D.2.1(c)

1 Q Now, did you publish this study that you performed?

2 A No, I did not.

3 Q And you did not present this in an exhibit or in any way  
4 as part of your testimony?

5 A No, I did not.

6 Q Has it been subjected to peer review?

7 A Well, the Washington 2 design basis earthquake is in the  
8 FSAR, and that did receive extensive review.

9 Q No, did your study receive peer review? You said that  
10 you conducted a study by which you compared Nine Mile 2  
11 to WPS 2, and I am asking whether that study --

12 A Well, that was one aspect of my review or study, yes.

13 Q And was that study exposed to peer review?

14 A No, but the facts are subject to extensive review. The  
15 design basis earthquake is a very large part of the  
16 review for constructing the plant.

17 Q But your interpretation of those facts is what I am  
18 asking about. Your interpretation of those facts has  
19 not been subject to peer review.

20 A Well, I have talked to a Staff geologist on it, and also  
21 on comparison of labor rates between the Pacific Northwest  
22 and the North Atlantic, I looked at the Handy Whitman  
23 index for nuclear power plants and it is higher in the  
Northwest than it is in the Northeast.

D.2.1(b)  
D.2.1(c)

1 Q But, again, whatever you did, whatever the list of things  
2 that you looked at, you did not put it together in a  
3 published package and subject it to review by anybody  
4 in the industry?

5 A No, but the outline of it is contained in my testimony.

6 Q Now, in 1981 this Commission reviewed an estimate for  
7 decommissioning Nine Mile 2 of 86.2 million in 1978  
8 dollars. I believe that was in Case 28059, or perhaps  
9 some earlier review of Nine Mile 2.

10 A This was Nine Mile 2 --

11 Q Yes.

12 A -- or Nine Mile 1.

13 Q Nine Mile 2. Is that a correct statement, to your  
14 knowledge?

15 A Could you repeat the question?

16 Q I am asking you just to confirm whether an estimate of  
17 86.2 million in 1978 dollars for decommissioning Nine  
18 Mile 2 was presented to this Commission on behalf of the  
19 cotenants?

20 A Yes. It is on page 6 of my testimony.

21 Q Now, do you know whether this was incorporated by the  
22 Commission into its assumptions regarding the Commission  
23 and the costs of continued construction of Nine Mile?

A I am not sure how it was incorporated, but it was an item

1 of concern, the decommissioning, but what the Commission  
2 did to balance it to determine whether to continue  
3 construction or not, I could not tell you.

4 Q Is that something you could check on in some way?

5 A The record in that area is very extensive. Unless you  
6 can give me a cite --

7 Q If we were to provide you with the citation to the  
8 record and the Commission decision in that case, would  
9 you for purposes of our conversation right now accept  
10 that the Commission used that figure in its calculations  
11 of the economics and the cost of continued construction  
12 of the Nine Mile 2?

13 A I know that Staff did use the figure of decommissioning  
14 cost in that case, whether to continue construction or  
15 not.

16 Q The Staff of the Public Service Commission --

17 A Right.

18 Q -- did use the 86.2?

19 A No, they used a higher number.

20 Q Used a higher number.

21 A Right.

22 Q Now, was that higher number also stated in 1978 dollars,  
23 or was it in some --

A Offhand I would not know. I would have to check that.

1 Q Now, if the \$100 million that you are recommending is in  
2 '84 dollars and the contenants' estimate of 86.2 was in  
3 '78 dollars, and Staff used some higher number, is it  
4 possible that what you are really talking about is a  
5 decrease in the estimate from prior estimates for the  
6 decommissioning of Nine Mile 2?

7 A You are saying what Staff had used in their case?

8 Q You have told me that Staff used a higher figure than  
9 86.2. The missing ingredient that we do not know is  
10 what year dollars that was stated in, but it is possible  
11 that if we knew that fact, if we knew what year dollars  
12 those were in, and we knew the number-- and we do know  
13 that the 86.2 was based on '78 dollars -- that when we  
14 compare either of those to the \$100 million in '84  
15 dollars, what we are really talking about is a decrease  
16 in the estimate in real terms?

17 A The total would go down if you put it in '85 dollars;  
18 that is true.

19 Q Now, you have shown some familiarity with the NRC rules,  
20 and I would like you to state whether or not it is true  
21 that the NRC views the \$100 million as not accounting and  
22 not including the cost of demolishing the nonradioactive  
23 structures of a nuclear facility?

A That is not clear exactly. In the Battelle study, they

D.2.1(b)  
D.2.1(c)

1 say administrative buildings and warehouses and some other  
2 structures are beyond the jurisdiction of the NRC since  
3 they do not contain radioactivity contamination;  
4 however, the other structures would be removed to below  
5 grade and restored.

6 Q I notice that you have what looked like a copy of the  
7 relevant copy of the *Federal Register*.

8 A Yes, I do.

9 Q Do you have *Federal Register* Volume 50, No. 28, dated  
10 Monday, February 11, 1985, page 5600 and following?

11 A Yes.

12 Q Would you turn to 5606 and look in the right-hand column?  
13 About one-third of the way down there is a sentence that  
14 begins: This amount does not account for cost of  
15 shipment of spent fuel. . .then it goes on to say: or  
16 the cost of demolition of nonradioactive structures which  
17 is not required for NRC license termination.

18 A That is correct.

19 Q Now, do you have reason to dispute that?

20 A No, I do not.

21 Q Do you also see there that the NRC assumes --

22 A Excuse me. I lost the page again.

23 Q OK. It really does not matter. Maybe you do not need a  
page reference here: that the \$100 million is stated in

D.2.1(b)

1 '84 dollars, but the NRC assumes escalation at twice the  
2 CPI rate of inflation?

3 A That is what they are proposing, yes.

4 Q Now, have you presented a calculation based on rate year  
5 dollars of what that would translate into?

6 A No, I have not.

7 Q But it would be higher than 100 million?

8 A Yes, sir.

9 Q Have you examined any of the comments that have been  
10 filed on the proposed rules?

11 A No, I have not. I have talked to the one who is mentioned  
12 here in the *Federal Register* on the phone. They said they  
13 had received about 136, something in that neighborhood,  
14 comments, and they would not know if the proposed rule  
15 would be changed or not. They could not tell at this  
16 time.

17 Q It would not surprise you if some of those comments took  
18 issue with the adequacy of the \$100 million, would it?

19 A No, it would not surprise me at all.

20 Q And it would not surprise you if some of those comments  
21 came from both utility owners of nuclear plants and  
22 opponents of nuclear plans, opponents of the nuclear  
23 industry?

A No, it would not be surprising.

1 Q Are you familiar with a group called Public Citizen  
2 Environmental Action?

3 A Is that Ralph Nader's group?

4 Q I believe it is a subsidiary of some sort. I do not want  
5 to misstate the facts, but I think that is the case.

6 A I have heard of them.

7 Q Do you know whether or not they have criticized the  
8 \$100 million estimate as being inadequate?

9 MR. VAN RYN: Your Honor, I object. If  
10 Mr. Dax has some hypothetical questions, I wish he would  
11 state them in that manner. It is obvious the witness is  
12 not directly familiar with this matter.

13 MR. DAX: Fine. I withdraw the question.

14 BY MR. DAX:

15 Q Now, you indicated that you were familiar with the  
16 studies which underlie the \$100 million estimate. You  
17 referred to the Battelle study of the WPS 2 plant.

18 A Yes, I did.

19 Q And it is your understanding that that is the basis for  
20 the \$100 million.

21 A That is correct.

22 Q And is that known as NUREG-CR-0130?

23 A That is NUREG-CR-0672.

Q 0672?

D.1.1.1  
D.2.1(c)

1 A Yes.

2 Q That is the BWR study?

3 A That is correct.

4 Q OK. Then the one I quoted would be the PWR study?

5 A I would not know. I would have to check that.

6 (Continued on following page.)

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D.1.1.1

D.2.1(c)

- 1 Q Did you ever receive correspondence from one of the  
2 authors of that study concerning aspects of the  
3 study?
- 4 A Yes. I had correspondence from Mr. Smith concerning  
5 the curve -- the correlation coefficient, when you're  
6 using scaling down to -- from the reference plant to a  
7 lower powered reactor.
- 8 Q That was in the context of a Rochester case --
- 9 A Yes.
- 10 Q -- looking at the Ginna plant?
- 11 A That is correct.
- 12 Q I'd like to show you a document. This is a four-page  
13 document on the letterhead of Battelle Pacific Northwest  
14 Laboratories dated October 29, 1982 directed to  
15 Mr. Harvey R. Prins.
- 16 It's signed on the second page by Richard  
17 I. Smith and it has a two-page attachment to it.
- 18 Is this the letter that you have referred  
19 to?
- 20 A Yes, that is correct.
- 21 MR. DAX: Your Honor, I'd like to  
22 have this marked for identification.
- 23 JUDGE MATIAS: All right. Hand a copy  
to the reporter.

1 Mr. Reporter, this will be 175 for  
2 identification.

3 (The aforementioned document was marked  
4 as Exhibit No. 175 for identification.)

5 BY MR. DAX:

6 Q Now, let me just refer you to the second page of the  
7 letter. It appears therein that Mr. Smith offered what  
8 he terms a warning with respect to the use of the  
9 Battelle study, and in there he states that the analyses  
10 were intended to provide order of magnitude estimates  
11 good to within a factor of two, certainly, but not  
12 intended to be used without further site-specific  
13 analysis.

14 Is that a correct reading of the letter?

15 A If I recall, we were talking about the Ginna plant  
16 which would be scaled down from the PWR study. It was an  
17 addendum to the PWR study and we were discussing on the  
18 phone with Mr. Smith whether or not the scaling factor  
19 they had developed for the addendum to the PWR study  
20 would be applicable to Ginna.

21 Now, the scaling factor is what was under  
22 consideration at that time and he said that it should  
23 be valid within a factor of two. That was the scaling  
factor.

D.1.1.1  
D.2.1(c)

1 Q Now, that's with respect to the PWR study?

2 A The PWR study, right. The Ginna plant is a PWR some-  
3 where in the neighborhood of 600 megawatts --

4 Q Now --

5 A -- and the NUREG study was for 1,000 megawatts, so in  
6 the addendum to the PWR study, they had developed  
7 scaling -- scaling factors to get from the basic plant  
8 down to a smaller sized plant and that was the concern  
9 of using that scaling factor, to get an estimate for  
10 Ginna.

11 Q But his cautionary remarks go to the entire study in the  
12 addendum, do they not? He says that they are good  
13 within an order of magnitude of a factor of two.

14 A I believe he was just applying that to the scaling  
15 factor, not to the whole study.

16 Q That's how you interpreted this?

17 A That's how I interpreted that, because that was the item  
18 under discussion.

19 Q Did you ever call him up or have any further  
20 correspondence to discuss whether your understanding of  
21 that was as you so stated?

22 A No, I did not pursue that particular aspect of it.

23 Q So in your view, the scaling factors, then, were to  
be viewed as accurate within a factor of two? That's

D.1.1.1  
D.2.1(c)

1 what you're saying?

2 A Yes. In the addendum to the FWK study, which I don't  
3 have the number offhand, but it may be the one you  
4 referred to earlier, they had evaluated three smaller  
5 plants and drew a curve to -- I think it was three or  
6 four, I'm not sure.

7 But they had evaluated three or four  
8 smaller plants to draw a curve in order to extrapolate  
9 downwards from the base study and one of the plants they  
10 had chosen for a data point to that curve was the Ginna  
11 plant and he was saying in this letter, when I was  
12 talking to him on the phone, that the study for Ginna was  
13 not as thorough as the other ones and therefore it  
14 would be within a factor of two, definitely.

15 Q And you don't believe that that same caution would --  
16 just in your knowledge of how these studies are  
17 performed, you don't believe that that same cautionary  
18 limitation would be applicable to any other parts of the  
19 study?

20 A Well, the precaution is published in the study itself.  
21 It could not be applied blindly to any plant.

22 You would have to see if it was applicable,  
23 so there is a precaution in this study that is a little  
different than what's in the letter and the precaution

D.1.1.1  
D.2.1(c)

1 in the study says that if you just apply it to any plant,  
2 you're liable to come up with an error.

3 However, if you examine the parameters  
4 that are in there and see that they're applicable to  
5 the site you're considering, they definitely would be  
6 much closer than a factor of two.

7 Q It could be under those situations, if you find that  
8 the study plant was very similar to the target plant,  
9 that you --

10 A And you took into consideration the other factors like  
11 the weight scale and the seismic design and transportation  
12 difficulty, if you looked at all of them and saw no  
13 reason to discard the Battelle study, then the Battelle  
14 study results should be applicable.

15 Q So would you agree, then, as a general matter, that  
16 the better a plant -- excuse me. The better a study  
17 approximates the condition of a plant that's being  
18 examined for purposes of estimating costs, the better  
19 will be that study for using it as the basis for the  
20 estimate?

21 MR. VAN RYN: Your Honor, I'd just like  
22 to be clear that that's a hypothetical question.

23 MR. DAX: No, it's not a hypothetical  
question. It's a question of procedure.

D.1.1.1

D.2.1(c)

1 BY MR. DAX:

2 Q Is it true that as a matter of procedure, in your  
3 opinion, that the closer the study plant approximates  
4 the plant in question, the better and more reliable  
5 will be the study results when applied to the plant in  
6 question?

7 MR. VAN RYN: I'll accept that.

8 THE WITNESS: Yes, that's true.

9 BY MR. DAX:

10 Q Now, you've criticized along these lines the NUS study  
11 which formed the basis for the decommissioning cost  
12 estimate that the Company is currently applying prior  
13 to the TLG update which has now been precluded  
14 from this case?

15 A Right.

16 Q And you say that one problem with NUS study was that the  
17 reference plant was a PWR plant and correctly point out  
18 that Nine Mile 2 is a BWR plant; is that correct?

19 A That is correct.

20 Q And you also refer to the study presented by  
21 Mr. LaGuardia in Case 28059 in December of 1981, and you  
22 say that that was based on a plant more akin to Nine  
23 Mile 2.

A That is correct.

1 Q So as between the NUS study and that study, you would  
2 say that the 19 -- December 1981 study would be the  
3 preferable one as between those two?

4 A If it was just between those two, that would be correct.

5 Q And would you then agree as a general matter that the  
6 more effort that's taken to refine our knowledge of the  
7 specifics of a plant, the more we focus on plant  
8 characteristics that are unique to that plant,  
9 characteristics of the whole economy, wage rates, things  
10 like that, the better the reliability of the study  
11 in question?

12 A Are you comparing one study to another?

13 Q No. Again, I'm going back --

14 A Yes, the more effort you put into the study, the better  
15 it should be.

16 Q The more site-specific it is, the better it should be?

17 MR. VAN RYN: Your Honor, I object. The  
18 site-specific issues have already been dealt with --

19 MR. DAX: I don't understand how this --

20 MR. VAN RYN: -- unless he makes it quite  
21 clear that this is a hypothetical question.

22 JUDGE MATIAS: I don't think --

23 MR. DAX: I don't think it's a  
hypothetical question. I'm just talking about general

1 policy, engineering.

2 JUDGE MATIAS: Of course, I think the  
3 question was answered some time ago, but I will permit  
4 an answer in case I'm wrong on that score.

5 THE WITNESS: Well, if the studies are  
6 of equal quality, then a site-specific study would be  
7 preferable to a generic study if it were of equal quality.

8 BY MR. DAX:

9 Q Fine. Now I want you to turn to Mr. LaGuardia's study,  
10 and I know that his -- I mean his testimony.

11 I know his testimony has been precluded.  
12 I'm only using it for reference to a quotation  
13 that's in it. Do you have his --

14 MR. VAN RYN: Your Honor, if he would  
15 like to read a quotation from another document, that  
16 would be fine. I don't want the testimony referred to.  
17 If you would like to read a quotation --

18 JUDGE MATIAS: It can be referred to.

19 MR. DAX: I can mark it as an exhibit  
20 if I want to.

21 (Pause)

22 JUDGE MATIAS: I have it right here.

23 MR. DAX: All right.

(Document proffered by Judge Matias to

D.2.1(a)

1 Mr. Dax.)

2 THE WITNESS: I believe I don't have it.

3 BY MR. DAX:

4 Q Well, I'll show you this. I have a copy in my file, too.  
5 I just wanted to have a copy for you.

6 What I'm referring to is a quotation from  
7 an American Association of Cost Engineers, a  
8 definition of the word or the concept "contingency" and  
9 there is an indented paragraph appearing on that page  
10 of the precluded testimony which sets out that definition.

11 Have you previously seen that definition  
12 in the course of reviewing this testimony or at any  
13 other time?

14 A I've seen it.

15 Q OK. Just so that I can get this in the record, since  
16 the testimony will not be -- let me read it.

17 It says "Contingency is a cost element  
18 of an estimate to cover a statistical probability of  
19 the occurrence of unforeseeable elements of cost within  
20 the defined project scope due to a combination of  
21 uncertainties, untangibles and unforeseen/highly unlikely  
22 occurrences of future events based on management's  
23 decision to assume risks (for the occurrence of those  
events)." Do you have any comment on that?

1 Do you agree with that definition or do  
2 you disagree with that definition?

3 A No.

4 Q You agree with it?

5 A I agree with that, that that's what it says.  
6 However, I agree that's an acceptable standard for a  
7 contingency factor.

8 Q Well, do you have a different definition in mind if you  
9 were to define the term "contingency"?

10 A No, I do not.

11 Q On pages 8 and 9 of your testimony, you state that  
12 the 25 percent contingency that was included in the  
13 Battelle study which formed the basis for the NRC's  
14 \$100 million estimate should cover all differences  
15 between the referenced plant and Nine Mile 2. Is that  
16 your testimony?

17 A Yes, that is my testimony.

18 (Continued on following page.)  
19  
20  
21  
22  
23

JOCKET NUMBER

PROPOSED RULE

PR-30,40,50 detail. 142  
(50 FR 5600)

700 N. Alabama St. Apt 1011  
Indianapolis, IN 46204-1323

October 27, 1985

Mr. Samuel J. Chilk, Secretary  
Attn: Docketing and Service Branch  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Chilk:

Pursuant to the notice of the proposed rule on the Decommissioning Criteria for Nuclear Facilities, 10 CFR §30, §40, §50, §51, §70, §72, 50 FR 5,600 (1985), I am respectfully submitting the following comments.

It appears both from the discussion of the proposed rule ("Mechanisms for Requiring Financial Assurance", 50 FR 5,606 (1985)), and the content of the proposed rule (10 CFR §50.33(k)(1), 50 FR 5,618 (1985)), that the U.S. NRC is implicitly adopting a cost estimate of \$100,000,000 (1984 dollars) for the decommissioning of commercial nuclear power reactor facilities, and an annual rate of escalation for this cost estimate that is double the rate of escalation of the Consumer Price Index (CPI) of the U.S. Department of Labor, Bureau of Labor Statistics. The adoption of the \$100,000,000 figure as the least cost of decommissioning for commercial nuclear power reactor facilities, and of the associated escalation rate at double the escalation rate of the CPI, presents the following problems that can impede the most cost efficient implementation of the proposed rule:

1. The adopted least cost of decommissioning for commercial nuclear power reactor facilities in 10 CFR §50.33(k)(1) does not differentiate between the following factors that significantly affect nuclear decommissioning cost estimates:
  - (a) The type(s) of the nuclear power reactor(s) present in the facility, e.g., pressurized water reactor(s) (PWR's) v. boiling water reactor(s) (BWR's);
  - (b) The adopted method(s) of decommissioning for the reactor(s) present in the facility, e.g., immediate dismantlement (DECON) v. safe storage (SAFSTOR) v. entombment (ENTOMB); and
  - (c) The number of the nuclear reactor units present in the facility, e.g., a single reactor facility v. a multiple reactor facility.
2. Electric utilities that operate or will operate commercial nuclear power reactor facilities will be inclined to adopt the 10 CFR §50.33(k)(1) decommissioning cost estimate and its associated escalation rate or a higher cost estimate and a higher escalation rate. Such an inclination will be motivated by the following factors:
  - (a) The intention to attain the maximum level of financial assurance for the availability of decommissioning funds; and

D.2.1(a)

D.8.3.1

Acknowledged by card NOV - 1 1985 *pd*

J-589

- (b) The intention to attain the maximum amount of flexibility in respect to the U.S. NRC licensing requirements regarding financial assurance of nuclear decommissioning funding (proposed 10 CFR §50.33(k), 50 FR 5,618 (1985), "Mechanisms for Requiring Financial Assurance", 50 FR 5,606 (1985), "Criteria for Funding Methods", 50 FR 5,607, 5,608 (1985)).

D.8.3.1

Such intentions will result in undue financial burdens for nuclear utility ratepayers and in possible conflicts with utility-specific and facility-specific decommissioning cost estimate, escalation and funding mechanism ratemaking determinations that have been or will be made by various state public utilities commissions.

3. The adopted least cost of decommissioning and the relevant cost escalation rate stated in 10 CFR §50.33(k)(1), as well as their proposed periodic review process, fail to account for the following factors:

- (a) Advances in nuclear decommissioning technology, e.g., robotics;
- (b) Increased specialization of the labor force involved in nuclear decommissioning activities;
- (c) The effect of successive nuclear reactor decommissionings on certain decommissioning cost categories; and
- (d) The inclusion of sizeable contingency factors in existing decommissioning cost estimates of generic or facility-specific nature.

D.2.1(a)

As it has already been demonstrated in the U.S. NRC sponsored studies of the Pacific Northwest Laboratory, there are substantial decommissioning cost differences between PWR and BWR nuclear power facilities even if the same decommissioning method was to be used, e.g., the DECON cost estimate of a single unit BWR was found to be approximately 31% higher than the DECON estimate of a single unit PWR (Draft Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, U.S. NRC, NUREG-0586, January 1981, Table O.O-2, p. O-45). Similarly, the decommissioning cost estimates under the DECON, SAFSTOR and ENTOMB methods for the same type of a nuclear power reactor facility do differ by substantial amounts. The cost of decommissioning nuclear power reactor facilities is affected by the number of the nuclear reactor units present in the facility, e.g., the cost of decommissioning each unit will decline after the first unit has been decommissioned (Norm G. Wittenbrock, et. al., Technology, Safety, and Costs of Decommissioning Light Water Reactors at a Multiple Reactor Station, NUREG/CR-1755, Pacific Northwest Laboratory, January 1982).

The maximum level of assurance for the availability of funds for the completion of nuclear decommissioning activities can be achieved only at considerable cost. Nuclear decommissioning costs have long been recognized by public utility regulators as a legitimate expense for electric utility operators of nuclear power facilities. Consequently, nuclear decommissioning costs are recovered from the ratepayers of public utilities with nuclear power facilities as a "revenue requirement". This revenue requirement is usually determined on the basis of a facility-specific decommissioning cost estimate (engineering cost derivation or generic study cost estimate with appropriate adjustments), the adopted decommissioning cost escalation rate, and by the funding mechanism that is approved by the utility regulators for

D.8.3.1

the future financing of decommissioning activities (In Re Decommissioning Costs of Nuclear Powered Generators, Florida Public Service Commission, Docket No. 810100-EU, Order No. 12356, August 12, 1983, 55 PUR4th 1 (1983), In Re Indiana and Michigan Electric Company, Indiana Public Service Commission, Cause No. 36760-S1, March 23, 1983, 52 PUR4th 340 (1983), In Re Nuclear Facility Decommissioning Costs, California Public Utilities Commission, Decision No. 83-04-013, OIT 86, April 6, 1983, 52 PUR4th 340 (1983), In Re Pennsylvania Public Utility Commission et. al. v. Metropolitan Edison Company, Docket No. R-822249 et. al., October 14, 1983, 56 PUR4th 230 (1983)).

If a least cost of decommissioning of \$100 million and a cost escalation rate at double the inflation rate are adopted in the proposed rulemaking, then various electric utilities will seek to obtain rate increases that will:

1. Supersede any previous ratemaking decisions that were made on the state and federal levels establishing decommissioning cost estimates that were below the proposed \$100 million benchmark, and cost escalation rates that were below the proposed escalation rate at double the inflation rate; and
2. Maximize the level of assurance for the availability of nuclear decommissioning funds without regard to cost, i.e., the revenue requirement that will be recovered from the utility ratepayers.

The proposed rulemaking does not sufficiently address the area of interaction between the level of assurance for the availability of decommissioning funds that is or will potentially be required by the U.S. NRC, and the associated cost in terms of revenue requirements, e.g., the effects of the Tax Reform Act of 1984 on nuclear decommissioning funding options have not received any discussion (see Federal Tax Guide Reports, Commerce Clearing House, Vol. 67, No. 42, July 20, 1984, ¶1146, p. 315). Similarly, the role of state and federal public utility regulatory bodies in determining nuclear decommissioning revenue requirements, and their interaction with nuclear utilities and the U.S. NRC, have received little discussion.

A review of state utility regulatory commission decisions (see previous Public Utilities Reports citations), and a review of the technical literature (including the report by Stone and Webster Engineering Corporation, Analysis of Nuclear Power Reactor Decommissioning Costs, Atomic Industrial Forum, AIF/NESP-021, May 1981), suggest that the escalation rates for decommissioning costs are below the escalation rate of double the inflation rate that is suggested in the proposed rulemaking. In updating (or escalating) decommissioning cost estimates we have to deal with the weighted cost escalation rates for the various decommissioning cost categories. Thus, although the radioactive material and waste disposal costs for a single unit Westinghouse PWR escalated at rates above the escalation rates of conventional cost indices (CPI, GNP deflator, various Handy-Whitman indices) for the 1978-1981 period, these costs constituted approximately 27.6% of the total decommissioning cost estimate (NUREG/CR-0130 Addendum, including non-radioactive structure demolition, excluding nuclear fuel shipment), which escalated at a rate approximate to those of conventional cost indices (Battelle Pacific Northwest Laboratories, "Decommissioning Cost Updating Factors: 1978 to 1981 Cost Base", NUREG/CR-0130 Addendum, internal communication dated March 29, 1982). Considering the fact that the 1981-1984 period has been one of subsiding inflation, the adoption of a \$100 million decommissioning cost estimate and of an escalation rate at double the inflation rate is not supported by the available studies.

D.2.1(a)

D.8.3.1

D.2.1(a)

The adoption of a decommissioning cost escalation rate at double the inflation rate will also tend to increase the revenue requirement for decommissioning funds, since, under any funding option, the ratepayers will not accrue any significant savings from earnings on their contributions to a decommissioning fund, e.g., if we were to assume a \$100 million decommissioning cost, an annual escalation rate of 16% (2\*8%), and a tax-exempt annual earnings rate of 9% for an external sinking fund, the annual revenue requirement for financing a decommissioning fund over the 30-year life of a nuclear power reactor facility would approximately be \$63 million; if the long-term annual cost escalation rate was to be set at 8% with all the other variables remaining the same, the annual revenue requirement for decommissioning would be \$7.4 million. The annual revenue requirement for decommissioning cost funding will be considerably larger for utility ratepayers that did not commence financing decommissioning costs for nuclear power reactors from the start of their commercial operations.

D.2.1(a)

The technology of nuclear power plant decommissioning is advancing in step with developments in the fields of robotics and of artificial intelligence. Remotely controlled robots dedicated to the task of chemical decontamination in highly radioactive areas have been utilized in the Three Mile Island Unit 2 cleanup (Gregg M. Taylor, "Remote handling systems help TMI-2 cleanup efforts", Nuclear News, December 1984, p. 52; see also Electric Power Research Institute, "Robots Join the Nuclear Workforce", EPRI Journal, Vol. 9, No. 9, November 1984, p. 6). Similarly, sophisticated radiation source detection and mapping equipment has also been used extensively in the Three Mile Island Unit 2 cleanup effort. Further development of robots with light, sound, and touch sensors that would function within the interiors of the reactor vessel could speed the process of decontaminating and cutting the most radioactive components during the decommissioning process ("Using robots for remote inspection and maintenance", Nuclear Engineering International, January 1985, p. 21).

C.8

The increased use of robotics will result in a reduction of manpower exposure to radiation during the phases of decontamination, dismantlement, and removal of the reactor building components. Consequent reductions in the manpower "turnaround rate" due to the decline in man-rem radiation exposure levels will result in increased worker efficiency and lower labor costs (according to U.S. NRC estimates the value of a man-rem of personnel radiation for electric utilities ranges from \$1,000 to \$5,000; Electric Power Research Institute, supra). In addition, robots involved in the decommissioning of one facility can be decontaminated and used again. Furthermore, standardization of design and manufacturing for decommissioning equipment will lead to lower per unit equipment costs. Thus, technological improvement does hold the potential of decreasing decommissioning costs or at least substantially retarding their escalation rate.

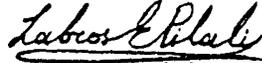
Labor specialization in nuclear decommissioning activities is another area where economies of scale will be realized. The efficiency of the nuclear decommissioning workers will increase after a series of nuclear reactor decommissionings, with resulting savings in time and cost. The increased specialization of the work force in the various decommissioning tasks, and the involvement of specialized firms in areas such as decontamination, cutting, waste disposal, and demolition, will have positive rather than negative effects for decommissioning costs and their escalation.

The costs of planning and mobilizing for the decommissioning of a nuclear reactor facility will certainly be positively influenced from the previous planning and operational experience of similar reactor decommissionings; e.g., assuming a 30-year life for pressurized water reactors, the decommissioning

of Westinghouse Electric Corporation PWR's in the 2010-19 time period will benefit from the planning and operational experience of at least 15 similar Westinghouse PWR's that will be in some stage of decommissioning in the 2000-09 time frame. Incorporation of design features during the construction of nuclear reactor facilities that will facilitate decommissioning can also have positive implications for the duration of decommissioning activities and their costs (Nuclear Energy Agency, Organization for Economic Cooperation and Development, Decommissioning Requirements in the Design of Nuclear Facilities, proceedings of the NEA specialist meeting, Paris, France, March 17-19, 1980).

I have attempted to demonstrate that the decommissioning cost estimate of \$100,000,000 (1984 dollars) for commercial nuclear power reactor facilities, and its escalation rate at double the inflation rate, are not supported by the available evidence, and do not take into account any cost savings that are brought about by technological progress and accumulating operational experience. To ignore the effects of economies of scale when developing decommissioning cost estimates for specific nuclear reactor facilities is to inflate decommissioning costs unreasonably. I do recommend to the Commission that the provisions of financial assurance under 10 CFR §50.33(k)(1) be modified without any reference to any specific decommissioning cost estimates and escalation rates.

Respectfully submitted,



Labros E. Pilalis  
M.P.A.

D.2.1(a)

INDEX NUMBER  
PROPOSED RULE PR-30,40,50 et al.

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DEC 20 10 41 10

December 20, 1985

WRITERS DIRECT DIAL  
(202)

Mr. Samuel J. Chilk  
Secretary  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Re: Proposed Rule Regarding Decommissioning  
Criteria For Nuclear Facilities,  
50 Fed. Reg. 5600 (February 11, 1985)

Dear Mr. Chilk:

The Utility Decommissioning Group ("UDG")<sup>1</sup> hereby submits the following additional comments relating to the Commission's proposed rule on Decommissioning Criteria for Nuclear Facilities, 50 Fed. Reg. 5600 (February 11, 1985). The purpose of these additional comments is (1) to bring to the Commission's attention new information relevant to UDG's previous comments on the level of decommissioning costs, and (2) to address an issue raised by the State of Illinois in its comments, filed July 12, 1985, relating to the proper funding method to be used by an electric utility licensee where a plant has ceased operation and a period of storage or long-term surveillance will be provided prior to the completion of decommissioning activities. In its comments, Illinois made certain assertions, including representations as to the Staff position on this issue, which, in some respects, are at odds with UDG's understanding of the proposed rule. We have been advised by the Staff that additional comments on this issue would be welcome.

1/ UDG consists of fourteen power reactor licensees. In addition to the thirteen licensees identified in previous comments, Florida Power & Light Company is now a member of the Group. UDG submitted comments on the proposed rule on May 13, 1985, the original deadline for comments. After the deadline was subsequently extended to July 12, 1985, UDG filed further comments on that date, providing more recent decommissioning cost data and responding to certain comments filed by other parties.

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acknowledged by card..... *pd*

I. LEVEL OF DECOMMISSIONING FUNDING

In our previous comments, UDG emphasized that the Commission should not specify any particular level of funding as generally adequate to cover decommissioning costs. In particular, UDG criticized the statement in the preamble to the proposed regulations that the specified \$100 million figure for power reactors represents "sufficient funds to cover decommissioning costs for most" plants. 50 Fed. Reg. 5606, Col. 3. One reason for UDG's objection was that such specified amounts may be misused in ratemaking proceedings as establishing a ceiling on the level of decommissioning costs. Such a result would be counter to the Commission's desire for financial assurance.

In at least one pending rate case, the amount specified in the proposed rule has already been misused in this fashion by intervenors. We append to these comments the relevant portions of the motion to intervene and protest by certain municipal customers of Connecticut Light & Power Company, in which they argue (at page 28) that the Company's rate request should be rejected on the ground that, inter alia, the decommissioning allowance would "exceed the \$100 million per unit allowance suggested by the Nuclear Regulatory Commission's pending rulemaking . . . ." UDG again urges the Commission to make clear that the level of decommissioning funding is to be based on plant-specific cost estimates and that no generic cost estimate should be considered adequate for a particular plant.

D.2.1(a)

Recent preliminary cost studies (dated October 1985) for three multi-unit sites again show the inadequacy of the \$100 million figure. These studies are in addition to cost studies described in UDG's previous comments (because the studies have not yet been filed with the ratemaking authorities, the identity of the plants is not given):

<u>Location</u>	<u>Reactor Type</u>	<u>Capacity</u>	<u>Number of Units</u>	<u>Approximate Estimated Decommissioning Costs (1985 Dollars)</u>
Southeast	PWR	860 MW	3	\$400 million (for site)
Southeast	PWR	1180 MW	2	\$300 million (for site)
Southeast	PWR	1145 MW	2	\$350 million (for site)

II. FUNDING METHOD DURING PERIOD  
OF STORAGE OR SURVEILLANCE

A. Background and Summary

Under the Commission's proposed regulations, multi-asset utilities would be permitted to use an internal funding method for providing the costs of decommissioning. Proposed 10 C.F.R. §50.33(k)(4)(iv). However, in that part of the proposed regulations relating to license termination, proposed 10 C.F.R. §50.82(c), the Commission would provide as follows (emphasis added):

(c) Decommissioning plans which propose an alternative that delays completion of decommissioning by including a period of storage or long-term surveillance must provide that -

(1) Funds needed to complete decommissioning be placed into an account segregated from licensee assets and outside the licensee's administrative control during the storage or surveillance period, or a surety method or fund certification be maintained in accordance with the criteria of §50.33(k) . . . .

D.3.4

UDG had interpreted this provision to mean that where a multi-asset utility commences SAFSTOR and continues as an on-going multi-asset utility during the SAFSTOR period, the utility may continue to use an internal funding mechanism, provided it maintains with the Commission a certification such as that contemplated by proposed Section 50.33(k)(1) that adequate financing is being provided. See UDG Comments, filed May 13, 1985, at 19-20.

In its comments the State of Illinois argues that an electric utility licensee should be required to assign all monies collected for decommissioning over the operating life of the plant to an external account once the plant ceases to operate if a period of storage or long-term surveillance will be used as part of the decommissioning plan. Illinois Comments at 4-6. Illinois also urges the Commission to require such external funding whenever the decommissioning activities will take longer than one year to complete. *Id.* at 6. In connection with this position, Illinois states that the use of a "fund certification" under proposed Section 50.82(c)(1) is meant to be restricted to

licensees that provide certification under proposed 3(k)(3)(iv) that they will serve as guarantor of internal funding funds. With such a restriction, investor-owned utilities would be required to convert to an external funding period whenever a storage or surveillance period will be required and could not continue to use internal funding with a restriction under proposed 10 C.F.R. §50.33(k). Nothing in the proposed regulations or the statement of Illinois is cited as support for such a restriction. Illinois claims that "[d]iscussions with the NRC staff" indicated that the use of a fund certification under Section 3033 would be limited to government licensees.

Illinois' position goes too far. There is no rational basis requiring a conversion from internal funding to external funding by a multi-asset utility whenever a storage or surveillance will be provided. Instead, the Commission should provide for periodic review of financial statements on a case-by-case basis before and during the storage period to determine whether continued use of internal funding is

B. Discussion

There Is No Rational Basis For Requiring Conversion From Internal Funding to External Funding By Multi-Asset Utilities Whenever A Storage Period Will Be Provided

Illinois puts forth essentially three reasons for requiring conversion to external funding in the event internal funding will be delayed by even a short period of storage or surveillance. First, Illinois argues that if a portion of the operating costs has to be collected after the plant ceases operation, a ratepayer equity problem arises in that the ratepayer who would be required to pay this portion of the operating costs may not have benefited from the power generated at the plant. Illinois Comments at 5. Second, Illinois states that "if a prepaid external fund is not required, there could be a conflict between the need for funds to maintain generating capacity being decommissioned and the need to decommission funds." Illinois Comments at 6. Third, Illinois argues generally that internal funding is riskier and more costly than external funding.

Illinois' first point -- the ratepayer equity argument -- is non sequitur. The question of ratepayer equity is a separate concern and has nothing to do with financial

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other units or purchase power from other utilities. Therefore, the shutting down of a generating facility does not in and of itself have any adverse impact on a utility's overall revenues and rate of return. In short, the utility remains an equally secure institution after one of its generating facilities is taken out of service and decommissioned.

Finally, it is simply irrational to require utilities to make an immediate conversion from internal to external funding at the end of plant operation. By requiring utilities to convert a substantial amount of assets to liquid capital over a short period of time, such a provision could itself strain licensee resources and financial markets and adversely affect the financial position of the utility. Such a requirement could also bias utilities against alternatives such as SAFSTOR which may be the most environmentally safe option in terms of radiation exposure.

3. The Continued Use of Internal Funding Can Be Reviewed on a Case-By-Case Basis, and Conversion To External Funding Can Be Ordered When Necessary

As we have shown, there is no rational basis for requiring an immediate conversion to external funding whenever a storage period will be used. However, we recognize that there may be some concern with the continued use of an internal fund where decommissioning may be delayed for an indefinite period of time. The financial stability of any institution cannot be guaranteed indefinitely. Nevertheless, such uncertainties apply equally to external and internal accounts. The funds in external accounts must be invested somewhere, and it is likely the utilities will remain as secure an institution in the long term as other investment opportunities.

We recommend that the Commission address each case on an individual basis to determine whether a conversion to external funding is warranted. The Commission may require utilities that plan to use SAFSTOR in conjunction with internal funding to submit, as part of the decommissioning plan under proposed Section 50.82, appropriate documentation as to their financial posture. In addition, the Commission can establish a mechanism for periodic review of financial assurance during the storage period. Cf. Proposed Section 50.82(c)(2) (requiring means for adjusting cost estimates and funding levels during storage period). If it appears that internal funding no longer provides adequate assurance, the Commission may then require a conversion to external funding. The utility, however, should be permitted to make the conversion on a schedule consistent with its other

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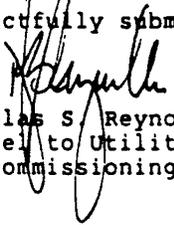
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financial obligations and market conditions. An immediate conversion during a period of high interest rates may result in excessive financing costs.

III. CONCLUSION

For the foregoing reasons, the proposed rule should be clarified (1) to indicate that where a multi-asset utility commences a program of decommissioning, such as SAFSTOR, that includes a period of storage or long-term surveillance, and the utility continues as an on-going multi-asset utility during this period, it is not required to convert to the use of an external funding mechanism; and (2) to establish a mechanism for case-by-case review to determine whether the use of an internal reserve will continue to provide reasonable funding assurance.

Respectfully submitted,

  
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Attachment

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