

OCT 12 1988

Project M-32

Dr. Willis W. Bixby, Director
West Valley Project Office
U. S. Department of Energy
P. O. Box 191
West Valley, NY 14171

Dear Dr. Bixby:

Enclosed for your information is the recently published NRC rule on decommissioning requirements for nuclear facilities, along with the attendant press release. Your staff and contractors will find this useful in preparing a decontamination and decommissioning plan for the West Valley Demonstration Project.

Sincerely,

Original Signed By:

R. Davis Hurt
West Valley Project Manager
Fuel Cycle Safety Branch
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material
Safety and Safeguards

Enclosure:
NRC Rule for Decommissioning
Nuclear Facilities

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**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
Office of Governmental and Public Affairs
Washington, D.C. 20555

No. 88-91
Tel. 301/492-0240

FOR IMMEDIATE RELEASE
(Tuesday, June 28, 1988)

**NRC ISSUES RULES ON GENERAL REQUIREMENTS
FOR DECOMMISSIONING NUCLEAR FACILITIES**

The Nuclear Regulatory Commission is amending its regulations to include technical and financial criteria for decommissioning licensed nuclear facilities. The existing regulations cover decommissioning requirements only in a limited way.

The amended regulations deal with decommissioning planning needs, timing, funding mechanisms and environmental review requirements. The rules provide assurance that licensed nuclear facilities will be decommissioned in a safe and timely manner and that adequate funds will be available for decommissioning purposes.

The amendments apply to all NRC licensees except licensees for uranium mill and mill tailings, low-level radioactive waste burial facilities, and high-level radioactive waste repositories, which have been addressed in separate regulatory actions.

The amendments define decommissioning as removing from service and reducing residual radioactivity to a level that would permit release of the property for unrestricted use and termination of license.

Three acceptable decommissioning alternatives are contemplated but not specified in the rules. They are:

DECON: under this alternative, equipment, structures, and portions of the site contaminated with radioactivity would be removed or decontaminated to a level which would permit the property to be released for unrestricted use shortly after operations have been terminated. It would satisfy the objective of unrestricted release of the property in a much shorter time period than the other alternatives while protecting the health and safety of workers and members of the public.

SAFSTOR: under this alternative, the nuclear facility would be placed and maintained in such a condition that it could be safely stored and decontaminated to levels which would permit release for unrestricted use at a later date. It would be an acceptable alternative if radiation doses to workers involved in the decommissioning process would be reduced significantly or in cases where almost all of the radioactivity would decay within a few months or years. It could also become necessary in other cases such as a shortage of offsite radioactive waste disposal space.

ENTOMB: under this alternative, radioactive materials would be encased in a structurally long-lived material such as concrete and the structure would be maintained and surveyed until the radioactivity had decayed to a level permitting the unrestricted release of the property. This alternative could reduce radiation doses to workers as well as the volume of radioactive waste but would be expected to be of limited use because of practical considerations.

The amendment requires that decommissioning begin shortly after nuclear facility operations have been terminated and that the time to reach unrestricted use be minimized.

Planning for decommissioning is divided into two parts: preliminary and final.

Initial aspects of planning are financial planning and facilitation of decommissioning. Current license holders and applicants for new licenses have to submit either funding plans or certification of financial assurance in amounts which may be greater but not less than that specified in the rules. For power reactors, the amounts vary based on the type and size of the reactor; for materials facilities, the amounts depend on the quantity of licensed material possessed. Funding plans will have to include a cost estimate and identify a means of providing financial assurance for decommissioning. Generally, facilitation of decommissioning should be considered under the principle of keeping exposures to radiation as low as reasonably achievable; the rule requires specifically only that relevant records be kept to assure adequate information is available at the time of decommissioning.

Final planning involves the submission of decommissioning plans for review and approval in advance of initiation of any major decommissioning activity where a significant health and safety question could be involved. These final plans have to include as appropriate:

- (1) a description of decommissioning procedures to be used including plans for processing and disposing of the radioactive waste;
- (2) a description of methods used to ensure the safety of workers and members of the public;
- (3) a plan for a final radiation survey to ensure that the property is suitable for release for unrestricted use;
- (4) a cost estimate to ensure that adequate funds will be available before decommissioning activities are initiated; and
- (5) a description of quality assurance and safeguards provisions if appropriate for the specific license.

A number of alternative methods for assuring that funds for decommissioning--either prematurely or at the end of operations--will be available are set forth in the rules. They include:

- (1) Prepayment--under this alternative, funds would be set aside, prior to commencement of operations, in an account segregated from other licensee funds.
- (2) Surety, insurance, or other guarantee method--this alternative includes methods to guarantee, including parent company guarantees, that decommissioning costs will be paid should the licensee default.
- (3) External sinking fund--under this alternative, funds would be set aside periodically over the life of the facility in an account segregated from other licensee funds. This segregated account would be coupled with a surety guaranteeing funds for decommissioning in the event of licensee default unless the licensee is an electric utility.
- (4) Statement of intent by Federal, State or Local government licensees, as appropriate, that funds for decommissioning will be obtained when necessary.

The new requirements will reduce the specific requirements for environmental reviews related to decommissioning by:

- (1) Providing that the decommissioning of reactors and certain materials facilities will no longer require environmental impact statements unless specifically determined by the Commission; environmental assessments will be prepared, however.
- (2) Providing that information concerning environmental impacts will be submitted by licensees as a supplement to previously developed environmental reports.

The requirements for decommissioning, written as amendments to Parts 30, 40, 50, 51, 70 and 72 of the NRC's regulations, will be effective on July 27, 1988.

1988-89 marketing order expenditures for Marketing Order Nos. 921, 922, and 924.

For Washington peaches, expenditures of \$18,378 and an assessment rate of \$2.25 per ton of peaches under M.O. 921 were recommended. In comparison, 1987-88 budgeted expenditures were \$25,136 and the assessment rate was \$2.00 per ton. On May 27, 1988, the Washington Peach Marketing Committee met and revised their assessment rate to \$1.20 per ton of peaches and revised the crop estimate. Assessment income for 1988-89 is estimated at \$14,040 based on the revised crop estimate of 11,700 tons of peaches. Committee reserves and other funds will be available to cover the anticipated \$4,338 deficit for 1988-89.

For Washington apricots, expenditures of \$6,170 and an assessment rate of \$2.25 per ton of apricots under M.O. 922 were recommended by the SFEMC. In comparison, 1987-88 budgeted expenditures were \$5,802 and the assessment rate was \$1.25 per ton. On May 27, 1988, the Washington Apricot Marketing Committee met and revised their assessment rate to \$2.00 per ton of apricots. Assessment income for 1988-89 is estimated at \$7,000 based on a crop estimate of 3,500 tons of apricots.

For Washington-Oregon prunes, expenditures of \$17,342 and an assessment rate of \$2.25 per ton of prunes under M.O. 924 were recommended by the SFEMC. In comparison, 1987-88 budgeted expenditures were \$23,462 and the assessment rate was \$3.00 per ton. On May 27, 1988, the Washington-Oregon Fresh Prune Marketing Committee met and revised their assessment rate to \$1.00 per ton of fresh prunes and revised the crop estimate. Assessment income for 1988-89 is estimated at \$9,300 based on the revised crop estimate of 9,300 tons of fresh prunes. Committee reserves and other funds will be available to cover the anticipated \$8,042 deficit for 1988-89.

While this final action will impose some additional costs on handlers, the costs are in the form of uniform assessments on all handlers. Some of the additional costs may be passed on to producers. However, these costs will be significantly offset by the benefits derived from the operation of the marketing orders. Therefore, the Administrator of the AMS has determined that this action will not have a significant economic impact on a substantial number of small entities.

This action adds new §§ 921.227, 922.227, and 924.228 and is based on committee recommendations and other

information. A proposed rule was published in the May 13, 1988, issue of the *Federal Register* (53 FR 17056). Comments on the proposed rule were invited from interested persons until May 23, 1988. Comments were received from the Washington Peach Marketing Committee, the Washington Apricot Marketing Committee, and the Washington-Oregon Fresh Prune Marketing Committee, in which they requested the establishment of revised assessment rates and/or crop estimates.

After consideration of the information and recommendations submitted by the committees, the comments received, and other available information, it is found that this final rule will tend to effectuate the declared policy of the Act.

These budgets and assessment rates should be expedited because the committees need to have sufficient funds to pay their expenses, which are incurred on a continuous basis. In addition, handlers are aware of this action, which was recommended by the committees at public meetings. Therefore, the Secretary also finds that good cause exists for not postponing the effective date of this action until 30 days after publication in the *Federal Register* (5 U.S.C. 553).

List of Subjects in 7 CFR Parts 921, 922, and 924

Apricots, Marketing agreements and orders, Oregon, Peaches, Prunes, Washington.

For the reasons set forth in the preamble, new §§ 921.227, 922.227, and 924.228 are added as follows:

Note.—These sections will not appear in the Code of Federal Regulations.

1. The authority citation for 7 CFR Parts 921, 922, and 924 continues to read as follows:

Authority: Secs. 1-19, 48 Stat. 31, as amended; 7 U.S.C. 601-674.

2. New §§ 921.227, 922.227, and 924.228 are added to read as follows:

PART 921—FRESH PEACHES GROWN IN DESIGNATED COUNTIES IN WASHINGTON

§ 921.227 Expenses and assessment rate

Expenses of \$18,378 by the Washington Fresh Peach Marketing Committee are authorized, and an assessment rate of \$1.20 per ton of assessable peaches is established for the fiscal year ending March 31, 1989. Unexpended funds may be carried over as a reserve.

PART 922—APRICOTS GROWN IN DESIGNATED COUNTIES IN WASHINGTON

§ 922.227 Expenses and assessment rate.

Expenses of \$6,970 by the Washington Apricot Marketing Committee are authorized, and an assessment rate of \$2.00 per ton is established for the fiscal year ending March 31, 1989.

Unexpended funds may be carried over as a reserve.

PART 924—FRESH PRUNES GROWN IN DESIGNATED COUNTIES IN WASHINGTON AND UMATILLA COUNTY, OREGON

§ 924.228 Expenses and assessment rate.

Expenses of \$17,342 by the Washington-Oregon Fresh Prune Marketing Committee are authorized, and an assessment rate of \$1.00 per ton of assessable prunes is established for the fiscal year ending March 31, 1989. Unexpended funds may be carried over as a reserve.

Dated: June 22, 1988.

William J. Doyle,

Associate Deputy Director, Fruit and Vegetable Division, Agricultural Marketing Service.

[FR Doc. 88-14373 Filed 6-24-88 & 8:45 am]

BILLING CODE 3410-02-M

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 30, 40, 50, 51, 70, and 72

General Requirements for Decommissioning Nuclear Facilities

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission is amending its regulations to set forth technical and financial criteria for decommissioning licensed nuclear facilities. The amended regulations address decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the amendments 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. The final rule also contains a response to a petition for rulemaking (PRM-50-32), concerning decommissioning financial assurance, initially filed by the Public Interest

Research Group (FIRC), et al. on July 5, 1977.

EFFECTIVE DATE: July 27, 1988.

FOR FURTHER INFORMATION CONTACT: K. Steyer, C. Feldman, or F. Cardile, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555; telephone (301) 492-3824.

SUPPLEMENTARY INFORMATION:

Introduction

The NRC is amending its regulations to provide specific requirements for the decommissioning of nuclear facilities. Specifically the regulations establish criteria in the following areas: Acceptable decommissioning alternatives; planning for decommissioning; assurance of the availability of funds for decommissioning; and environmental review requirements related to decommissioning.

Decommissioning as defined in the rule means to remove nuclear facilities safely from service and to reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license. Decommissioning activities are initiated when a licensee decides to terminate licensed activities. Decommissioning activities do not include the removal and disposal of spent fuel which is considered to be an operational activity or the removal and 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. If nuclear facilities are to be reused for nuclear purposes, applications for license renewal or amendment or for a new license are submitted according to the appropriate existing regulation. Reuse of a nuclear facility for other nuclear purposes is not considered decommissioning because the facility remains under license.

These amendments apply to the decommissioning of power reactors, nonpower reactors, fuel reprocessing plants, fuel fabrication plants, uranium hexafluoride production plants, independent spent fuel storage installations, and nonfuel-cycle nuclear facilities. The decommissioning of uranium mills and mill tailings, low-level waste burial facilities, and high-level waste repositories, has been treated in separate regulatory actions. These amendments apply to nuclear facilities that operate through their normal

lifetime, as well as to those that may be shut down prematurely.

The purpose of these amendments is to assure that decommissionings will be carried out with minimal impact on public and occupational health and safety and the environment. The Commission's objective is that decommissioned facilities would ultimately be available for unrestricted use for any public or private purpose. The amendments provide a regulatory framework for more efficient and consistent licensing actions related to decommissioning. Although decommissioning is not an imminent health and safety problem, the nuclear industry is maturing, in that nuclear facilities have been operating for a number of years, and the number and complexity of facilities that will require decommissioning is expected to increase in the near future. Inadequate or untimely consideration of decommissioning, specifically in the areas of planning and financial assurance, could result in significant adverse health, safety and environmental impacts. These impacts could lead to increased occupational and public doses, increased amounts of radioactive waste to be disposed of, and an increase in the number of contaminated sites. The regulations make clear that the licensee is responsible for the funding and completion of decommissioning in a manner which protects public health and safety. Current regulations cover the requirements and criteria for decommissioning in a limited way and are not fully adequate to deal with licensee decommissioning requirements effectively. Many licensing activities concerning decommissioning have had to be determined on a case-by-case basis. This procedure results in inconsistency in dealing with licensees and in inefficient and unnecessary administrative effort. With the increased number of decommissionings expected, case-by-case procedures would make licensing difficult and increase NRC and licensee staff resources needed for these activities.

Background

On March 13, 1978, the Commission published an Advance Notice of Proposed Rulemaking in the *Federal Register* (43 FR 10370) stating that the Commission was reevaluating its decommissioning policy and considering amendments to its regulations to provide more specific requirements relating to the decommissioning of nuclear facilities. The plan for the reevaluation included the development of an information base, the preparation

of a generic environmental impact statement (GEIS), and based on these, the development of amendments to the regulations. The information base for preparation of the final rule is complete and consists primarily of a series of NUREG/CR reports on studies of the technology, safety, and costs of decommissioning various kinds of nuclear facilities. These reports were prepared by Battelle Pacific Northwest Laboratories (PNL).¹ In addition, preliminary staff positions on the major decommissioning issues have been presented in staff (NUREG) reports. On February 10, 1981, the Commission announced the availability of the draft GEIS for public comment (46 FR 11666). Section 15 of the draft GEIS contains certain policy recommendations. These recommendations, as modified by comments received on the draft GEIS and other sources, provided the basis for the proposed amendments to the Commission's regulations.

On February 11, 1985, the Commission published a Notice of Proposed Rulemaking on Decommissioning: Criteria for Nuclear Facilities (50 FR 5600). The proposed amendments covered a number of topics related to decommissioning that would be applicable to 10 CFR Parts 30, 40, 50, 70, and 72 applicants and licensees. The original comment period was due to expire May 13, 1985, but was extended to July 13, 1985 to accommodate requests from interested parties for an extended comment period in order to fully evaluate the issues raised and develop comments on the proposed rule. Public comments received on the proposed rule were docketed and may be examined at the Commission's Public Document Room located at 1717 H Street NW., Washington, DC.

Acceptable levels of residual radioactivity for release of property for unrestricted use were not proposed as part of this rulemaking. Commission staff is participating in an interagency working group, organized by the Environmental Protection Agency (EPA), developing Federal guidance on this subject. Proposed Federal guidelines are anticipated to be published by EPA and EPA has issued an advance notice of proposed rulemaking (51 FR 22264, June 18, 1986). In the interim, NRC is developing interim guidance with respect to residual contamination criteria.

¹ A bibliography of the PNL and NRC staff reports and other background documents is included at the end of the supplementary information. These documents are available for inspection and copying for a fee in the Commission's Public Document Room at 1717 H Street NW., Washington, DC 20555.

Overview of Comments on Proposed Rule

A total of 143 different organizations and individuals submitted comments on the proposed rule. The commenters represented a variety of interests. Comments were received from Federal government agencies, State agencies (including State public utility commissions), local governments, universities, individuals, electric utilities, material possessors, public groups, utility and industry groups, and financial, legal, and engineering firms. The commenters offered from one to over 50 comments each and presented a diversity of views. The topics addressed by the commenters addressed a wide range of issues and all parts of the rule.

The general response to the rule was varied. 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 indicated that the proposed amendments will provide a foundation from which acceptable decommissioning planning and implementation programs can be developed, and another indicated 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 and another 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 re-drafted and republished for comment. 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; and another pointed out that decommissioning methods are regulated by public utility commissions and that NRC should only step in to ensure safety.

The detailed rationale supporting these general comments is presented in the succeeding sections of this

Supplementary Information.

Modifications have been made to the rule as a result of some of these more specific comments. Based on its consideration of the comments, the Commission continues to believe 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.

Major issues contained in the public comments and resulting changes in the rule are discussed below. The detailed responses to individual comments are documented in NUREG-1221 entitled "Summary, Analysis and Response to Public Comments on Proposed Rule Amendments on Decommissioning Criteria for Nuclear Facilities" (Ref. 26). Copies of NUREG-1221 may be purchased through the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082. Copies may also be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Va 22161. A copy is available for inspection or copying for a fee in the NRC Public Document Room, 1717 H Street NW., Washington, DC 20555. The discussion of comments in this Supplementary Information is structured according to the general subjects treated by the rule and discussed in the Supplementary Information to the Proposed Rule. These subjects include, in order of discussion, decommissioning alternatives and timing, planning, financial assurance, residual radioactivity limits, environmental review requirements, and other general comments.

Summary and Discussion of Comments on Proposed Rule

A. Decommissioning Alternatives and Timing

Comments received on the subject of decommissioning alternatives covered several areas. These included clarification of the definition of decommissioning, criteria used for the choice of the alternative in particular cases, and general questions as to acceptability of the decommissioning alternatives.

1. Definition of decommissioning. Two commenters indicated that requiring unrestricted use as part of the definition of decommissioning is too restrictive. Reasons given for this comment include the fact that it would inhibit future use of the site and 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.

In 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 § 50.2 (and related sections in the other parts) decommissioning is defined as resulting in release of the property for unrestricted use and termination of the license. 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 A.2 through A.4 of this Supplementary Information, 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.

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 the proposed § 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." Two commenters indicated that the rule should clarify that it does not apply to the nonradioactive portion of the facility.

In response to this comment, the definition of decommissioning in § 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 § 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. Criteria used for choice of alternative. A number of commenters indicated that the rule does not contain sufficient criteria that a facility 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 statement of considerations while other commenters indicated that it is.

In 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 B.2.

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 nonpower 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 nonpower reactors. However, the proposed rule has been modified to provide additional detail on the factors affecting acceptability of decommissioning alternatives for nonpower 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 B.2 for acceptability in terms of completing decommissioning and protecting public health and safety.

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. 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.

In responding to this comment it should be noted that NRC has had Battelle Pacific Northwest Laboratory (PNL) prepare detailed analyses of the technology, safety, and costs of decommissioning. These reports were prepared for a number of nuclear facilities and are listed in the Reference section. 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 on which assessment of 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.

3. DECON and SAFSTOR
Decommissioning Alternatives. DECON and SAFSTOR are defined in the Supplementary Information to the proposed rule as follows: DECON is the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations; SAFSTOR is the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use.

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. Two commenters expressed the opinion that the rule seems to favor use of DECON for reactors.

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 offsite. The Generic Environmental Impact Statement on Decommissioning Nuclear Facilities (NUREG-0816) (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 § 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 A.2, 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.

With regard to SAFSTOR, six 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.

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 A.2, modified § 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.

4. The ENTOMB Alternative. ENTOMB was defined in the Supplementary Information to the proposed rule as the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the

entombed structure is appropriately maintained and continued surveillance is carried out until the radioactivity decays to a level permitting unrestricted release of the property.

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. 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.

It is the Commission's belief that the ENTOMB alternative for decommissioning should not be 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. 2, 3) 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, 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 Supplementary Information 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.

B. Planning for Decommissioning

Comments received on the subject of decommissioning planning covered several areas. These included the licensing scheme for the decommissioning process; the criteria for conducting and evaluating decommissioning plans and activities and license termination, occupational exposure, safeguards, and quality assurance during decommissioning;

recordkeeping and facilitation; and the effect of the rule on shutdown reactors.

1. Licensing scheme for decommissioning. 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, procedural criteria for the termination process, and the restrictions and requirements that apply to a "possession-only license." One commenter indicated that there might be loopholes which would be exploited by the industry resulting in adverse impacts to the public and the environment and another commenter indicated that explicit procedural criteria would remove a needless burden on applicants and result in a more cost and time effective licensing process.

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 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 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.

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.

2. Criteria for decommissioning activities and license termination. 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 "satisfying 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 commenters indicated that without more specific criteria for acceptability of decommissioning plans, the Commission would exercise little authority over licensee actions during decommissioning and one commenter indicated that the licensees could conduct decommissioning with "virtually complete independence." Two commenters indicated that the rule

"assumed" that utilities would follow basic safety criteria.

In response, it should be noted that 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; a description of the planned final radiation survey; quality assurance and safeguards provisions, 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 provides guidance on ensuring that occupational exposures are ALARA and Regulatory Guide 1.143 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. 25).

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.

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.

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 1.26 under consideration.

3. Occupational exposure during decommissioning. 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 felt 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 suggested specific requirements such as training of workers prior to work in highly radioactive areas.

In 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.

4. Safeguards during decommissioning. A commenter pointed out that the applicability of safeguards requirements to decommissioning is unclear. In response, as noted above in Section B.2, 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.

5. Quality assurance during decommissioning. 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 comments indicated the need for a separate or independent QA/QC staff. Two commenters suggested some specific procedures which should be subject to QA and two others refer to problems with decontamination activities at Saxton because of lack of QA.

The Commission agrees that quality assurance is important for decommissioning. The intent to include QA in decommissioning plans was mentioned in the statement of considerations of 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 provisions as they comply with 10 CFR Part 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 decommissioning plans.

6. Recordkeeping and facilitation. Commenter opinions concerning the recordkeeping requirements proposed was mixed. Several 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. 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.

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, if drawings are referenced, not requiring that each relevant document be indexed individually.

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 discussed how design facilitation and improvements in the technology of decommissioning (such as robots and remote devices) can reduce the costs, time, and exposures of decommissioning. Other commenters recommended that specific requirements for facilitation of decommissioning in design and operating procedures be included in the regulations.

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 technique 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 Commission has done some preliminary studies to identify possible beneficial features and techniques (NUREG/CR-3587, Reference 25).

7. Shutdown reactors. 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 and two commenters suggested an exemption procedure in the regulations would be better than a blanket exemption.

In response to this comment, it should be noted that 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 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. Financial Assurance

Comments received on the issue of assuring the availability of funds for

decommissioning included questions regarding costs of decommissioning, use of certification of a specified amount and funding plans for reactors, acceptable funding methods, submittal of funding plans, specific comments on funding for material licensees, funding for Federal licensees, and general questions concerning need for funding requirements and relationship of the rule to the functions of other regulatory agencies.

1. Cost of decommissioning. 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. A variety of alternative estimates and reasons for questioning the estimates were given. A summary of these are as follows:

(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 commenter 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 cost of decommissioning a reactor will likely equal the cost of construction of the plant.

The following is a discussion of the response to these concerns.

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, 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 considerations, 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 power reactor 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 experience. 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 situations 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 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 include: 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 construction costs at nuclear plants and 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 1982 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) 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 Battle-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 decommissioning rule amendments, which will require maintenance of funds by methods which keep pace with inflation and periodic adjustment of funds to account for effects of inflation, will provide assurance that funds are available to pay for decommissioning when needed.

2. Use of certification of a specified amount and funding plans for reactors. 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 (in 1984 dollars). The proposed rule also indicated that this value is to be adjusted annually 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 for the following general reasons:

(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) The inflation factor contained in the proposed rule was considered to be inaccurate because there was no basis to expect the decommissioning cost to increase at twice the CPI in the future, and the factor could be subject to misuse as noted above in (c).

(b) Some commenters indicated that if certification is retained that it should be revised and clarified. The following suggestions were made as to what should be done if certification is kept:

(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 to the \$120 to \$170 million range so that it is sufficiently high to include realistic decommissioning costs.

(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 include 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) 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, Handy-Whitman indexes for labor and materials and separate data sources for waste disposal.

(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 cost estimates in power reactor funding plans and that lack of criteria could result in confusion.

In responding to these comments it should be noted that, 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 development 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 is also intended to minimize NRC involvement in the rate regulatory process, which is an area outside of NRC 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 adjusting 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 non-reactor 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 ratepayers, 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 as follows:

(1) 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.

(2) As indicated in § 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 C.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.

(3) 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. This adjustment for plant size is based on PNL's generic evaluation of the effect of plant size on decommissioning cost and overall review 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-0872.

(4) 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 non-radioactive structures and materials beyond that necessary to terminate the NRC license. Costs of disposal of nonradioactive hazardous wastes not necessary for NRC license termination are not included in the prescribed amounts.

(5) 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-0872 and on NUREG-1307 (Ref. 27).

3. Acceptable funding methods. The proposed rule listed 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. The following were comments received on this issue:

(a) Those that disagreed with inclusion of internal reserve did so for the following principal reasons:

(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 ascertained 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. 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's analysis 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) The commenters who agreed with the inclusion of internal reserve as an acceptable funding method did so for the following principal reasons:

(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 it is unlikely that electric generation service would not be provided and, even in the case of insolvency, there will be a successor to the insolvent utility who would retain the obligation to decommission.

(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, commenters noted that there are financial risks associated with external reserve.

In developing the Proposed Rule, the Commission considered the question of the use of internal reserve in several documents. These include NUREG-0584, Revs. 1-3, "Assuring the Availability of Funds for Decommissioning Nuclear Facilities," (Ref. 14), NUREG/CR-1481, "Financing Strategies for Nuclear Power Plant Decommissioning," (Ref. 15) and NUREG/CR-3899, "Utility Financial Stability and the Availability of Funds for Decommissioning" (Ref. 18). 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" (Ref. 20). These reports and meetings considered several factors regarding availability of funds for public utilities in the United States. One factor is that utilities are 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 the utilities to charge reasonable rates subject to reasonable regulation and rules. In addition, the Commission has taken action recently 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, (Ref. 18) prepared by an NRC consultant, Dr. J. Singel 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 stated 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. 18) which reviewed six utilities which have been subject to severe financial distress. Based on the analysis, NUREG/CR-3899, Supp. 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 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 economic 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 action 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. 1270, 1230-32 (D.K. 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, Supp. 1 regarding bankruptcy at PSNH as well as the changing economic and financial conditions discussed in NUREG/CR-3899, Supp. 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 the internal reserve as a possible method of providing funds for decommissioning.

In reaching its conclusion not to permit use of internal reserve for

decommissioning, the Commission believes it 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 2 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 § 40.75(e) (1) and (3).

In a related comment, 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 40.54(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 non-accident 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.

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 non-accident related decommissioning was found in an earlier study performed for the NRC, NUREG/CR-2370 (Ref. 16), 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.

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. In response to

this comment, it is noted that 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 C.5 below, use of parent company guarantees backed up by financial tests will be permitted for private organizations operating research and test reactors.

Four commenters indicated agreement with proposed § 50.82(c)(1) which 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, while four commenters disagreed with the proposal indicating that utilities should not be required to shift to external funding. In response, as noted in the response to a previous comment, 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.

4. **Funding plans.** 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.

In response, the Commission agrees with the importance of updating the funding plan over the operating life of the plant. This was 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 update his cost estimate "at or about 5 years prior to the projected end of operations." 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 cost estimate and funding levels.

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. The Commission has considered these comments in 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.

5. **Funding requirements for material licensees.** 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 Am-241 in unsealed form requiring a decommissioning cost of \$500,000 is 10 millicuries. Three other commenters felt that the prescribed amounts appeared to be too low and cited specific examples 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. In addition, one of the commenters pointed out that use of contractors to perform the work could increase costs.

In response to the commenters who felt the estimates were too high, it is the opinion of the Commission, based on the 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 cleanup of accidental releases of radioactive material were noted as being under consideration in a separate rulemaking (see Advanced Notice of Proposed

Rulemaking published June 7, 1985, 50 FR 23960).

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., §§ 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.

PNL has provided updated decommissioning cost estimates to NRC for use in the Final Generic Environmental Impact Statement. 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 material 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.

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 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 appropriate agencies having responsibility over these wastes.

Several comments were received on the proposed rule sections which list 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, 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. One commenter indicated that letters of credit provided a cost-effective method for his operations.

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 at 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 permit licensees to 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 the other financial methods listed in the rule to satisfy the requirements of this section.

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.

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

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. In response to this comment, 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 or funding 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. If a licensee operates multiple independent facilities and/or sites under a single license, a consolidated

decommissioning 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.

Two commenters expressed concern regarding the licensee's responsibility for decommissioning. One commenter indicated that it was not clear in the proposed rule whether financial assurance requirements apply to each licensee, each licensee, or each facility and recommended that the licensee be specified as the responsible unit. The other commenter expressed the concern that there exists the potential for reducing companies' liability for decontamination activities should the NRC approved funding plan be inadequate.

In response to these comments, it should be noted that amended 10 CFR Parts 30, 40, and 70 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. Funding and decommissioning plans submitted by a holder of multiple materials licenses may be consolidated. 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, § 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. 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 find the means for completing decommissioning.

6. Funding requirements for Federal licensees. One commenter, the Department of the Army, indicated 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. The 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.

The Commission, in responding to this comment, notes that it is based 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. 366, 369 (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 is 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 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 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 within the constraints of governmental budgetary policies.

7. General comments on financial assurance. 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. Several 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. In particular one 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 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.

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 of 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 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 licensee whose rate regulator does not allow the licensee to recover funds in its rates and set up a decommissioning fund.

In response to these comments it should be noted that 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 Resources Conservation & Development Commission*, 461 U.S. 190, 212-13, 217-19 (1983); see also *United Nuclear Corporation v. Common*, 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.

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. 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 consumers by developing reasonable rates for providing public utility services. Under the existing statutory scheme the NRC has the authority to require specific funding arrangements in order to protect public health and safety whereas the other agencies do not. 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.

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 qualification 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 a 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 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 safe and

timely manner. The methods allowed include a variety of methods currently available to licensees. As noted in the response to a comment in Section C.3, 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 C.3. As noted in Section C.2 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 in 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 similar concerns. In addition, the rule does not deal with costs of demolition of nonradioactive 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 outlined above, considering the distinct roles that the NRC and the ratemaking agencies have, NRC will not become involved in the rate regulation process as it related 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.

With regard to the specific concern regarding formation of holding companies, 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. 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, the Supplementary Information and the text of the rule make clear that the licensee must take responsibility for planning for decommissioning by providing a reasonable level of assurance that funds are available for decommissioning and, at the time of permanent termination of operations, by submitting 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 by preparing the property for release for unrestricted use and that this responsibility cannot be evaded.

D. Residual Radioactivity

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 minimis level. Several commenters made specific comments on the numeric value of the residual limit and how it should be chosen. Commenters also 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. Commenters also indicated that the value of residual radioactivity limits will impact cost for non-power reactors.

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. NRC is planning to implement this guidance as soon as possible. The selection of an acceptable level is outside the scope of this rulemaking. 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 1/21/82 providing "Radiation criteria for release of the dismantled Stanford Research Reactor to unrestricted access." The NRC is currently developing interim guidance with respect to residual contamination criteria. 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 thru 13) and Oak Ridge National Laboratory (Refs. 17 and 19) 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.

It is imperative that decommissioning regulations in 10 CFR Parts 20, 40, 50, 70, and 72 be issued at this time because it is important to establish financial assurance provisions, as well as other decommissioning planning provisions, as soon as possible so that funds will be available to carry out decommissioning in a manner which protects public health and safety. Based on the need for the decommissioning rule to supplement provisions currently existing with those contained in the rule amendments, the Commission believes that the rule can and should be issued now.

E. Environmental Review Requirements

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, while other commenters made specific comments supporting this aspect of the proposed rule. Of the commenters opposed, several thought that the proposed rule violated the National Environmental Policy Act, one commenter felt that there needed to be

more successful experience at 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, and 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.

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 analysis 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 the 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.

F. Other General Comments

A number of comments of a general nature, some of which were outside the scope of the regulation, were received. Detailed responses to individual comments are contained in NUREG-1221. General comments discussed below include questions regarding applicability of the regulations to different licensees and those regarding waste disposal.

1. *Applicability of regulation to different licensees.* 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 also that there was considerable experience in decommissioning research reactors and that there were no uncertainties. Another commenter stated that adequate but not excessive effort to obtain that the decommissioning of research reactors at universities is on a thin thread," and that the addition 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.

In response, it should be noted that the Commission has not drafted the rule amendments for power reactors and

then applied it 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 (Ref. 4). 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 is in line with the projected costs for a particular reactor. The remainder of the comment concerned about the thread of research reactors hanging on this thread, in fact, support 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 requirements to the extent possible.

2. Waste disposal considerations related to decommissioning. A number of commenters indicated that NRC must carefully study wastes resulting from decommissioning and provide proper classification of these wastes. Commenters stated that decommissioning standards should include clear definitions of high-level (including spent fuel), low-level, and "intermediate level" wastes and 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 four commenters that without availability of disposal capacity there could be problems with carrying out decommissioning, in particular lack of high-level waste sites could cause problems.

In response to these comments it should be noted that 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 included in the waste classification system of 10 CFR Part 61 include long lived activation products such as Ni-59 and 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 safely 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:

Waste class	PWR (volume percent)	BWR (volume percent)
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 referenced 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. For spent fuel, which although not included as a decommissioning activity could nevertheless impact on the decommissioning schedule, a detailed schedule for development of monitored

retrievable storage and geologic disposal capacity is provided in the Nuclear Waste Policy Act of 1982.

Licenses 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 actions necessary 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 include an assessment of the current waste disposal conditions. If for any reason disposal capacity for decommissioning wastes were unavailable, then the provisions in § 50.82 to allow delay in completion of decommissioning which would permit temporary safe storage of decommissioning waste. In addition, § 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.

PIRG, et al., Petition for Rulemaking, Docket No. PRM-50-22

On July 5, 1977, as supplemented October 7, 1977, and January 3, 1978 the Public Interest Research Group (PIRG), Arizonans for Safe Energy, Citizens United Against Radioactive Environment, Community Action Research Group, Critical Mass Energy Project, Environmental Action Foundation, Environmental Action, Inc., New Mexico Public Interest Research Group, New York Public Interest Research Group, North Anna Environmental Coalition, Texas Public Interest Research Group, and National Consumer Law Center Energy Project (hereinafter the "petitioners"), petitioned the Commission to initiate rulemaking to promulgate regulations for

nuclear power plant decommissioning which would require plant operators to post bonds, to be held in escrow, to ensure that funds would be available for proper and adequate isolation of radioactive material upon each plant's decommissioning.

On June 22, 1979, the Commission published in the *Federal Register* (44 FR 36523) a partial denial of the petitioners' request. In this notice the Commission specifically denied the petitioners' request to immediately initiate rulemaking to implement a specific decommissioning funding plan that would require nuclear power plant operators to post surety bonds to cover decommissioning costs. The Commission granted the petitioners' request to reconsider the adequacy of its regulations on decommissioning. The Commission indicated that other issues and funding alternatives raised by the petitioners would be considered within the context of the NRC decommissioning rulemaking proceedings.

In addition to surety bonds, the petitioners advanced two other options to finance nuclear power reactor decommissioning: (1) Funds in an amount sufficient to pay for projected decommissioning would be set aside in an escrow account before commencing reactor operations, and (2) funds would be accumulated in a sinking fund during the life of the plant supplemented by a surety arrangement as necessary to allow for the risk of a licensed utility going bankrupt before the sinking fund had accumulated sufficient funds. The petitioners indicated that the requirements should apply to existing licensees as well as future licensees. The petitioners also raised the issue of the Commission's jurisdiction to regulate the arrangements for decommissioning. The original petitioners joined by others, submitted comments in response to the *Federal Register* notice (44 FR 36523, June 22, 1979). These comments were received on November 21, 1979. The comments discussed NRC's jurisdiction to promulgate rules mandating specific requirements covering decommissioning costs, the need for NRC to establish a rule requiring its licensees to make specific financial plans to meet decommissioning costs, surety bonds as a supplementary option and the disadvantage of unfunded alternatives.

The PIRG petition and the petitioners' supplementary comments were considered in the development of this rule. The Commission agrees that its regulations should be amended to require that licensees plan for decommissioning and provide reasonable assurance that funds will be

available to cover decommissioning costs when needed. For reasons discussed in the previous sections, the Commission does not believe it is necessary, or desirable, to require a specific financial method for collecting decommissioning funds beyond the listing in the modified proposed rule. The amendments require licensees to submit a report indicating the level of funding and the funding method for assuring that funds will be available for decommissioning. Acceptable methods are indicated in the amendments. This procedure covers all applicants for operating licenses and existing licensees under Part 50. To the extent that the petitioners would require promulgation of a specific method for financing power reactor decommissioning, the petition is denied. To the extent that the proposed amendments would allow consideration of the petitioners' suggested financing methods, including surety bonds if they are available, the petition is granted. This action completes NRC consideration of the issues raised in PRM-50-22.

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Draft copies of reference items 18, 20, 26, and 27 and of Addendum 4 of Reference 2 and Addendum 3 of Reference 3 are available for inspection and/or copying for a fee in the NRC Public Document Room, 1717 H Street NW., Washington, DC 20555. These items are to be published in the near future as NUREGs. After publication, these items will also be made available through the U.S. Government Printing Office and the National Technical Information Service.

Copies of all other referenced documents may be purchased through the U.S. Government Printing Office by calling (202) 275-2060 or by writing to the U.S. Government Printing Office,

P.O. Box 37082, Washington, DC 20013-7082. Copies may also be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. A copy is available for inspection or copying for a fee in the NRC Public Document Room, 1717 H Street NW., Washington DC 20555.

Environmental Impact Statement Availability

As required by the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in 10 CFR Part 51, the NRC has prepared a final generic environmental impact statement on the decommissioning of nuclear facilities.

A draft of the final generic environmental impact statement (FGEIS) is available for inspection and/or copying for a fee in the NRC Public Document Room, 1717 H Street NW., Washington, DC 20555. The FGEIS is to be published in the near future as a NUREG. After publication, the FGEIS will also be available by purchase from the U.S. Government Printing Office by calling (202) 275-2060 or by writing to the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082. Copies may also be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.

Paperwork Reduction Act Statement

This final rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). These requirements were approved by the Office of Management and Budget under approval numbers: Part 30-3150-0017; Part 40-3150-0020; Part 50-3150-0011; Part 70-3150-0009; and Part 72-3150-0132.

Regulatory Analysis

The Commission has prepared a regulatory analysis on this final regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The analysis is available for inspection in the NRC Public Document Room, 1717 H Street NW., Washington, DC. Single copies of the analysis may be obtained from C. Feldman, or F. Cardile, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492-3882.

Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the NRC has carefully considered the effect on small entities in developing the final rule and has attempted to tier the requirements to reduce the impact on small entities to the extent possible while adequately protecting health and safety.

Based on the information available, it is not expected that this rule will have a significant economic impact on a substantial number of small entities. The rule broadly affects all Commission applicants and licensees and, because Agreement States will be required to maintain compatibility with the proposed changes, the rule also affects Agreement State applicants and licensees. There are approximately 9,000 Commission licenses, which include about 5,200 byproduct material licenses under Parts 30 through 34, 2,500 medical licenses under Part 35, 400 source material licenses under Part 40, 200 production and utilization licenses (including approximately 50 applications in various stages of review) under Part 50, 700 special nuclear material licenses under Part 70, and 1 license and approximately 5 potential applicants under Part 72. Between 11,000 and 12,000 Agreement States' licensees are also affected.

The Commission estimates that approximately 40 percent of its licensees are considered small entities under the recently adopted NRC size standards (51 FR 50241; December 9, 1985). The NRC size standards for entities to be considered as small businesses are as follows:

- For most licensees, annual billings of \$3.5 million or less
- For private practice physicians, annual billing of \$1 million or less
- For State or public education institutions, the institution is supported by a jurisdiction with a population of 50,000 or less
- For other educational institutions, the institution has 500 or fewer employees.

Licensees under 10 CFR Parts 30 and 72 are not considered small entities.

All licensees including small entities will be required to keep records important to decommissioning. In general, for small licensees, such recordkeeping is "good practice" and should not constitute a significant change in operation. Generally, keeping records important to decommissioning reduces both the costs and health and safety impacts of decommissioning and can also result in savings in doses or costs during operation. Costs of

recordkeeping would tend to be recouped either in operation or at decommissioning.

The changes contained in this rule at the time of termination of license affect few small entities. These changes consist primarily of specifying in more detail contents of decommissioning plans, presently called "decontamination plans" in 10 CFR Parts 30, 40, and 70. Although more detailed plans may be required than have been considered acceptable in the past, there will also be a reduction in administrative effort because there will be less uncertainty as to what is expected. Overall, these changes are not expected to have a significant impact.

The most significant impact of this rule on licensees is likely to result from the financial assurance requirements. A cost estimate for decommissioning and a method of providing assurance of funds for decommissioning will be required of roughly 830 Commission licensees of which few if any will be small entities. Roughly another 660 Commission licensees including about 280 small entities will have the option of providing financial assurance in a prescribed amount and submitting a certification to that effect or submitting a funding plan to support a lower amount. A similar number of Agreement State licensees would also be affected. Those small entities affected would be almost exclusively industrial licensees. Because the historical information indicates that small industrial licensees are the most likely to default, it is particularly important that financial assurance be provided by these licensees. The rule allows as much flexibility as possible to licensees for providing financial assurance, in order to reduce the impact. Also, the economic impact of making cost estimates can be reduced by using the data base which has been developed.

The cost of this requirement depends on the method used. A surety or insurance method is likely to be used by small entities; it is estimated to cost approximately 1 to 2% of the face value, or 1 to 2% of decommissioning costs annually, plus the administrative cost of either developing a cost estimate and reporting on the funding methods to NRC or of making a certification. The cost of a surety using the prescribed amounts proposed in the rule would thus be in the range of \$500-\$10,000 per year. For a few small entities affected this would be a significant economic impact, however, these cases would present the highest risk of default.

A more detailed analysis of impacts to small entities is included in the Regulatory Analysis.

Backfit Analysis

The Commission has determined, on the basis of the record in this rulemaking, that the backfits which will be imposed as a result of this rule are necessary to ensure the adequate protection of public health and safety. Therefore, under section (a)(3) of the backfit rule, 10 CFR 50.109, neither a backfit analysis nor application of the backfit rule's cost-benefit standards is required for this rule. The regulatory analysis of these amendments constitutes the documented evaluation required by section (a)(4) of the backfit rule. This analysis contains the objectives of, and reasons for, the backfits entailed by these amendments and provides the basis for claiming that these backfits are necessary to ensure adequate protection to public health and safety.

List of Subjects

10 CFR Part 30

Byproduct material, Government contracts, Intergovernmental relations, Isotopes, Nuclear materials, Penalty, Radiation protection, Reporting and recordkeeping requirements.

10 CFR Part 40

Government contracts, Hazardous materials—transportation, Nuclear materials, Penalty, Reporting and recordkeeping requirements, Source material, Uranium.

10 CFR Part 50

Antitrust, Classified information, Fire prevention, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Penalty, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements.

10 CFR Part 51

Administrative practice and procedure, Environmental impact statement, Nuclear materials, Nuclear power plants and reactors, Reporting and recordkeeping requirements.

10 CFR Part 70

Hazardous materials—transportation, Nuclear materials, Packaging and containers, Penalty, Radiation protection, Reporting and recordkeeping requirements, Scientific equipment, Security measures, Special nuclear material.

10 CFR Part 72

Manpower training programs, Nuclear materials, Occupational safety and health, Reporting and recordkeeping

requirements. Security measures. Spent fuel.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 552 and 553, the NRC is adopting the following amendments to 10 CFR Parts 30, 40, 50, 51, 70, and 72.

PART 30—RULES OF GENERAL APPLICABILITY TO DOMESTIC LICENSING OF BYPRODUCT MATERIAL

1. The authority citation for Part 30 is revised to read as follows:

Authority: Secs. 82, 161, 182, 183, 186, 68 Stat. 935, 948, 953, 955, as amended; sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2111, 2112, 2201, 2232, 2233, 236, 2282); sec. 201, as amended, 202, 206, 38 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846).

Section 30.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 30.34(b) also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 30.61 also issued under sec. 187, 68 Stat. 965 (42 U.S.C. 2237).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273), §§ 30.3, 30.34(b) and (c), 30.41 (a) and (c), and 30.33 are issued under sec. 161b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); and §§ 30.6, 30.9, 30.36, 30.51, 30.52, 30.55, and 30.56 (b) and (c) are issued under sec. 161c, 68 Stat. 950, as amended (42 U.S.C. 2201(c)).

2. Section 30.4 is amended by adding a new paragraph (aa) to read as follows:

§ 30.4 Definitions

(aa) "Decommission" means to remove (as 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.

3. Section 30.32 is amended by adding a new paragraph (b) to read as follows:

§ 30.32 Application for specific licenses.

(h) As provided by § 30.35, certain applications for specific licenses filed under this part and Parts 32 through 35 of this chapter must contain a proposed decommissioning funding plan or a certification of financial assurance for decommissioning. In the case of renewal applications submitted before July 27, 1990, this submittal may follow the renewal application but must be submitted on or before July 27, 1990.

4. A new § 30.35 is added to read as follows:

§ 30.35 Financial assurance and recordkeeping for decommissioning.

(a) Each applicant for a specific license authorizing the possession and use of unsealed byproduct material of half-life greater than 120 days and in quantities exceeding 10^4 times the applicable quantities set forth in Appendix C to 10 CFR Part 20 shall submit a decommissioning funding plan as described in paragraph (e) of this section. The decommissioning funding plan must also be submitted when a combination of isotopes is involved if R divided by 10^4 is greater than 1 (unity rule), where R is defined here as the sum of the ratios of the quantity of each isotope to the applicable value in Appendix C.

(b) Each applicant for a specific license authorizing possession and use of byproduct material of half-life greater than 120 days and in quantities specified in paragraph (d) of this section shall either—

(1) Submit a decommissioning funding plan as described in paragraph (e) of this section; or

(2) Submit a certification that financial assurance for decommissioning has been provided in the amount prescribed by paragraph (d) of this section using one of the methods described in paragraph (f) of this section. For an applicant, this certification may state that the appropriate assurance will be obtained after the application has been approved and the license issued but prior to the receipt of licensed material. As part of the certification, a copy of the financial instrument obtained to satisfy the requirements of paragraph (f) of this section is to be submitted to NRC.

(c) (1) Each holder of a specific license issued on or after July 27, 1990, which is of a type described in paragraph (a) or (b) of this section, shall provide financial assurance for decommissioning in accordance with the criteria set forth in this section.

(2) Each holder of a specific license issued before July 27, 1990, and of a type described in paragraph (a) of this section shall submit, on or before July 27, 1990, a decommissioning funding plan or a certification of financial assurance for decommissioning in an amount at least equal to \$750,000 in accordance with the criteria set forth in this section. If the licensee submits the certification of financial assurance rather than a decommissioning funding plan at this time, the licensee shall include a decommissioning funding plan in any application for license renewal.

(3) Each holder of a specific license issued before July 27, 1990, and of a type described in paragraph (b) of this

section shall submit, on or before July 27, 1990, a certification of financial assurance for decommissioning or a decommissioning funding plan in accordance with the criteria set forth in this section.

(d) Table of required amounts of financial assurance for decommissioning by quantity of material.

greater than 10^4 but less than or equal to 10^5 times the applicable quantities of Appendix C of Part 20 in unsealed form. (For a combination of isotopes, if R , as defined in § 30.35(a), divided by 10^4 is greater than 1 but R divided by 10^5 is less than or equal to 1.)	\$750,000
greater than 10^5 but less than or equal to 10^6 times the applicable quantities of Appendix C of Part 20 in unsealed form. (For a combination of isotopes, if R , as defined in § 30.35(a), divided by 10^5 is greater than 1 but R divided by 10^6 is less than or equal to 1.)	\$150,000
greater than 10^{10} times the applicable quantities of Appendix C of Part 20 in sealed sources or plated foils. (For a combination of isotopes, if R , as defined in § 30.35(a), divided by 10^{10} is greater than 1.)	\$75,000

(e) Each decommissioning funding plan must contain a cost estimate for decommissioning and a description of the method of assuring funds for decommissioning from paragraph (f) of this section, including means of adjusting cost estimates and associated funding levels periodically over the life of the facility.

(f) Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) Prepayment. Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets such that the amount of funds would be sufficient to pay decommissioning costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.

(2) A surety method, insurance, or other guarantee method. These methods guarantee that decommissioning costs will be paid should the licensee default. A surety method may be in the form of a surety bond, letter of credit, or line of credit. A parent company guarantee of funds for decommissioning costs based

on a financial test may be used if the guarantee and test are as contained in Appendix A to this part. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of this section. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

(i) The surety method or insurance must be open-ended or, if written for a specified term, such as five years, must be renewed automatically unless 90 days or more prior to the renewal date, the issuer notifies the Commission, the beneficiary, and the licensee of its intention not to renew. The surety method or insurance must also provide that the full face amount be paid to the beneficiary automatically prior to the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the Commission within 30 days after receipt of notification of cancellation.

(ii) The surety method or insurance must be payable to a trust established for decommissioning costs. The trustee and trust must be acceptable to the Commission. An acceptable trustee includes an appropriate State or Federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(iii) The surety method or insurance must remain in effect until the Commission has terminated the license.

(3) An external sinking fund in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund. An external sinking fund is a fund established and maintained by setting aside funds periodically in an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of funds would be sufficient to pay decommissioning costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. The surety or insurance provisions must be as stated in paragraph (f)(2) of this section.

(4) In the case of Federal, State, or local government licensees, a statement of intent containing a cost estimate for decommissioning or an amount based on the Table in paragraph (d) of this section, and indicating that funds for decommissioning will be obtained when necessary.

(g) Each person licensed under this part or Parts 32 through 35 of this chapter shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission. If records of relevant information are kept for other purposes, reference to these records and their locations may be used. Information the Commission considers important to decommissioning consists of—

(1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

(2) As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored, and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination. If required drawings are referenced, each relevant document need not be indexed individually. If drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations.

(3) Records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

5. Section 30.38 is revised to read as follows:

§ 30.38 Expiration and termination of licenses.

(a) Except as provided in § 30.37(b) and paragraph (e) of this section, each specific license expires at the end of the day, in the month and year stated in the license.

(b) Each licensee shall notify the Commission promptly, in writing under § 30.6, and request termination of the license when the licensee decides to terminate all activities involving materials authorized under the license. This notification and request for termination of the license must include the reports and information specified in paragraphs (c)(1)(iv) and (v) of this

section and a plan for completion of decommissioning if required by paragraph (c)(2) of this section or by license condition.

(c)(1) If a licensee does not submit an application for license renewal under § 30.37, the licensee shall on or before the expiration date specified in the license—

(i) Terminate use of byproduct material;

(ii) Remove radioactive contamination to the extent practicable except for those procedures covered by paragraph (c)(2)(i) of this section;

(iii) Properly dispose of byproduct material;

(iv) Submit a completed form NRC-314, which certifies information concerning the disposition of materials; and

(v) Conduct a radiation survey of the premises where the licensed activities were carried out and submit a report of the results of this survey, unless the licensee demonstrates that the premises are suitable for release for unrestricted use in some other manner. The licensee shall, as appropriate—

(A) Report levels of radiation in units of microrads per hour of beta and gamma radiation at one centimeter and gamma radiation at one meter from surfaces, and report levels of radioactivity, including alpha, in units of disintegrations per minute (or microcuries) per 100 square centimeters removable and fixed for surfaces, microcuries per milliliter for water, and picocuries per gram for solids such as soils or concrete; and

(B) Specify the survey instrument(s) used and certify that each instrument is properly calibrated and tested.

(2)(i) In addition to the information required under paragraphs (c)(1)(iv) and (v) of this section, the licensee shall submit a plan for completion of decommissioning if the procedures necessary to carry out decommissioning have not been previously approved by the NRC and could increase potential health and safety impacts to workers or to the public such as in any of the following cases:

(A) Procedures would involve techniques not applied routinely during cleanup or maintenance operations; or

(B) Workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation; or

(C) Procedures could result in significantly greater airborne concentrations of radioactive materials than are present during operation; or

(D) Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operation.

(ii) Procedures with potential health and safety impacts may not be carried out prior to approval of the decommissioning plan.

(iii) The proposed decommissioning plan, if required by paragraph (c)(2)(i) of this section or by license condition, must include—

(A) Description of planned decommissioning activities;

(B) Description of methods used to assure protection of workers and the environment against radiation hazards during decommissioning;

(C) A description of the planned final radiation survey; and

(D) An updated detailed cost estimate for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and plan for assuring the availability of adequate funds for completion of decommissioning.

(iv) The proposed decommissioning plan will be approved by the Commission if the information therein demonstrates that the decommissioning will be completed as soon as is reasonable and that the health and safety of workers and the public will be adequately protected.

(3) Upon approval of the decommissioning plan by the Commission, the licensee shall complete decommissioning in accordance with the approved plan. As a final step in decommissioning, the licensee shall again submit the information required in paragraph (c)(1)(v) of this section and shall certify the disposition of accumulated wastes from decommissioning.

(d) If the information submitted under paragraphs (c)(1)(v) or (c)(3) of this section does not adequately demonstrate that the premises are suitable for release for unrestricted use, the Commission will inform the licensee of the appropriate further actions required for termination of license.

(e) Each specific license continues in effect, beyond the expiration date if necessary, with respect to possession of residual byproduct material present as contamination until the Commission notifies the licensee in writing that the license is terminated. During this time, the licensee shall—

(1) Limit actions involving byproduct material to those related to decommissioning; and

(2) Continue to control entry to restricted areas until they are suitable for release for unrestricted use and the Commission notifies the licensee in writing that the license is terminated.

(f) Specific licenses will be terminated by written notice to the licensee when the Commission determines that—

(1) Byproduct material has been properly disposed;

(2) Reasonable effort has been made to eliminate residual radioactive contamination, if present; and

(3)(i) A radiation survey has been performed which demonstrates that the premises are suitable for release for unrestricted use; or

(ii) Other information submitted by the licensee is sufficient to demonstrate that the premises are suitable for release for unrestricted use.

6. A new Appendix A is added to Part 30 to read as follows:

Appendix A—Criteria Relating to Use of Financial Tests and Parent Company Guarantees for Providing Reasonable Assurance of Funds for Decommissioning

I. Introduction

An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on obtaining a parent company guarantee that funds will be available for decommissioning costs and on a demonstration that the parent company passes a financial test. This appendix establishes criteria for passing the financial test and for obtaining the parent company guarantee.

II. Financial Test

A. To pass the financial test, the parent company must meet the criteria of either paragraph A.1 or A.2 of this section:

1. The parent company must have:

(i) 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

(ii) Net working capital and tangible net worth each at least six times the current decommissioning cost estimates (or prescribed amount if a certification is used); and

(iii) Tangible net worth of at least \$10 million; and

(iv) Assets located in the United States amounting to at least 90 percent of total assets or at least six times the current decommissioning cost estimates (or prescribed amount if a certification is used).

2. The parent company must have:

(i) A current rating for its most recent bond issuance of AAA, AA, A, or BBB as issued by Standard & Poor's or Aaa, Aa, A, or Baa as issued by Moody's; and

(ii) Tangible net worth at least six times the current decommissioning cost estimate (or prescribed amount if a certification is used); and

(iii) Tangible net worth of at least \$10 million; and

(iv) Assets located in the United States amounting to at least 90 percent of total

assets or at least six times the current decommissioning cost estimates (or prescribed amount if certification is used).

B. The parent company's independent certified public accountant must have compared the data used by the parent company in the financial test, which is derived from the independently audited, year end financial statements for the latest fiscal year, with the amounts in such financial statement. In connection with that procedure the licensee shall inform NRC within 90 days of any matters coming to the auditor's attention which cause the auditor to believe that the data specified in the financial test, should be adjusted and that the company no longer passes the test.

C. 1. After the initial financial test, the parent company must repeat the passage of the test within 90 days after the close of each succeeding fiscal year.

2. If the parent company no longer meets the requirements of paragraph A of this section, the licensee must send notice to the Commission of intent to establish alternate financial assurance as specified in the Commission's regulations. The notice must be sent by certified mail within 90 days after the end of the fiscal year for which the year end financial data show that the parent company no longer meets the financial test requirements. The licensee must provide alternate financial assurance within 120 days after the end of such fiscal year.

III. Parent Company Guarantee

The terms of a parent company guarantee which an applicant or licensee obtains must provide that:

A. The parent company guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the licensee and the Commission. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the licensee and the Commission, as evidenced by the return receipts.

B. If the licensee fails to provide alternate financial assurance as specified in the Commission's regulations within 90 days after receipt by the licensee and Commission of a notice of cancellation of the parent company guarantee from the guarantor, the guarantor will provide such alternative financial assurance in the name of the licensee.

C. The parent company guarantee and financial test provisions must remain in effect until the Commission has terminated the license.

D. If a trust is established for decommissioning costs, the trustee and trust must be acceptable to the Commission. An acceptable trustee includes an appropriate State or Federal Government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

PART 40—DOMESTIC LICENSING OF SOURCE MATERIAL

7. The authority citation for Part 40 is revised to read as follows:

Authority: Secs. 52, 53, 54, 55, 51, 161, 162, 183, 186, 8 Stat. 932, 933, 935, 946, 953, 954, 955, as amended; secs. 116(2), 83, 84, Pub. L. 95-604, 92 Stat. 3033, as amended, 3039, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2014(e)(2)), 2092, 2093, 2094, 2095, 2111, 2113, 2114, 2201, 2232, 2233, 2116, 2292; sec. 274, Pub. L. 86-373, 73 Stat. 688 (42 U.S.C. 2021); secs. 201, as amended, 202, 206, 68 Stat. 1242, as amended, 1244, 1248 (42 U.S.C. 5841, 5842, 5846); sec. 275, 92 Stat. 3021, as amended by Pub. L. 97-415, 96 Stat. 2067 (42 U.S.C. 2022). Section 40.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 40.31 (g) also issued under sec. 122, 68 Stat. 938 (42 U.S.C. 2152). Section 40.46 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 40.71 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

For the purposes of sec. 221, 68 Stat. 958, as amended (42 U.S.C. 2273); §§ 40.3, 40.25(d)(1)-(3), 40.35(a)-(d), 40.41(b) and (c), 40.46, 40.51(a) and (c), and 40.63 are issued under sec. 161b, 68 Stat. 946, as amended (42 U.S.C. 2201(b)), and §§ 40.5, 40.9, 40.25(c), (d)(3), and (4), 40.26(c)(2), 40.35(e), 40.42, 40.61, 40.62, 40.64, and 40.65 are issued under sec. 161c, 68 Stat. 950, as amended (42 U.S.C. 2201(c)).

8. Section 40.4 is amended by adding a new paragraph (s) to read as follows:

§ 40.4 Definitions.

(s) "Decommission" means to remove (as 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.

9. Section 40.31 is amended by adding a new paragraph (i) to read as follows:

§ 40.31 Applications for specific licenses.

(i) As provided by § 40.36, certain applications for specific licenses filed under this part must contain a proposed decommissioning funding plan or a certification of financial assurance for decommissioning. In the case of renewal applications submitted before July 27, 1990, this submittal may follow the renewal application but must be submitted on or before July 27, 1990.

10. A new § 40.36 is added to read as follows:

§ 40.36 Financial assurance and recordkeeping for decommissioning.

Except for licenses authorizing the receipt, possession, and use of source material for uranium or thorium milling, or byproduct material at sites formerly associated with such milling, for which financial assurance requirements are set forth in Appendix A of this part, criteria

for providing financial assurance for decommissioning are as follows:

(a) Each applicant for a specific license authorizing the possession and use of more than 100 mCi of source material in a readily dispersible form shall submit a decommissioning funding plan as described in paragraph (d) of this section.

(b) Each applicant for a specific license authorizing possession and use of quantities of source material greater than 10 mCi but less than or equal to 100 mCi in a readily dispersible form shall either—

(1) Submit a decommissioning funding plan as described in paragraph (d) of this section; or

(2) Submit a certification that financial assurance for decommissioning has been provided in the amount of \$150,000 using one of the methods described in paragraph (e) of this section. For an applicant, this certification may state that the appropriate assurance will be obtained after the application has been approved and the license issued but prior to the receipt of licensed material. As part of the certification, a copy of the financial instrument obtained to satisfy the requirements of paragraph (e) of this section is to be submitted to NRC.

(c) (1) Each holder of a specific license issued on or after July 27, 1990, which is covered by paragraph (a) or (b) of this section, shall provide financial assurance for decommissioning in accordance with the criteria set forth in this section.

(2) Each holder of a specific license issued before July 27, 1990, and covered by paragraph (a) of this section shall submit, on or before July 27, 1990, a decommissioning funding plan or certification of financial assurance for decommissioning in an amount at least equal to \$750,000 in accordance with the criteria set forth in this section. If the licensee submits the certification of financial assurance rather than a decommissioning funding plan at this time, the licensee shall include a decommissioning funding plan in any application for license renewal.

(3) Each holder of a specific license issued before July 27, 1990, and covered by paragraph (b) of this section shall submit, on or before July 27, 1990, a certification of financial assurance for decommissioning or a decommissioning funding plan in accordance with the criteria set forth in this section.

(d) Each decommissioning funding plan must contain a cost estimate for decommissioning and a description of the method of assuring funds for decommissioning from paragraph (e) of this section, including means of

adjusting cost estimates and associated funding levels periodically over the life of the facility.

(e) Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) Prepayment. Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets such that the amount of funds would be sufficient to pay decommissioning costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.

(2) A surety method, insurance, or other guarantee method. These methods guarantee that decommissioning costs will be paid should the licensee default. A surety method may be in the form of a surety bond, letter of credit, or line of credit. A parent company guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in Appendix A of 10 CFR Part 30. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of this section. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

(i) The surety method or insurance must be open-ended or, if written for a specified term, such as five years, must be renewed automatically unless 90 days or more prior to the renewal date, the issuer notifies the Commission, the beneficiary, and the licensee of its intention not to renew. The surety method or insurance must also provide that the full face amount be paid to the beneficiary automatically prior to the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the Commission within 30 days after receipt of notification of cancellation.

(ii) The surety method or insurance must be payable to a trust established for decommissioning costs. The trustee and trust must be acceptable to the Commission. An acceptable trustee includes an appropriate State or Federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(iii) The surety method or insurance must remain in effect until the Commission has terminated the license.

(3) An external sinking fund in which deposits are made at least annually.

coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund. An external sinking fund is a fund established and maintained by setting aside funds periodically in an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of funds would be sufficient to pay decommissioning costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. The surety or insurance provision must be as stated in paragraph (e)(2) of this section.

(4) In the case of Federal, State, or local government licensees, a statement of intent containing a cost estimate for decommissioning or an amount based on paragraph (b) of this section, and indicating that funds for decommissioning will be obtained when necessary.

(f) Each person licensed under this part shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission. If records of relevant information are kept for other purposes, reference to these records and their locations may be used. Information the Commission considers important to decommissioning consists of—

(1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

(2) As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored, and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination. If required drawings are referenced, each relevant document need not be indexed individually. If drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations.

(3) Records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

11. Section 40.42 is revised to read as follows:

§ 40.42 Expiration and termination of licenses.

(a) Except as provided in § 40.43(b) and paragraph (e) of this section, each specific license expires at the end of the day, in the month and year stated in the license.

(b) Each licensee shall notify the Commission promptly, in writing under § 40.5, and request termination of the license when the licensee decides to terminate all activities involving materials authorized under the license. This notification and request for termination of the license must include the reports and information specified in paragraphs (c)(1)(iv) and (v) of this section and a plan for completion of decommissioning, if required by paragraph (c)(2) of this section or by license condition.

(c)(1) If a licensee does not submit an application for license renewal under § 40.43, the licensee shall on or before the expiration date specified in the license—

- (i) Terminate use of source material;
- (ii) Remove radioactive contamination to the extent practicable except for those procedures covered by paragraph (c)(2)(i) of this section;
- (iii) Properly dispose of source material;
- (iv) Submit a completed form NRC-314, which certifies information concerning the disposition of materials; and
- (v) Conduct a radiation survey of the premises where the licensed activities were carried out and submit a report of the results of this survey, unless the licensee demonstrates that the premises are suitable for release for unrestricted use in some other manner. The licensee shall, as appropriate—

(A) Report levels of radiation in units of microrads per hour of beta and gamma radiation at one centimeter and gamma radiation at one meter from surfaces, and report levels of radioactivity, including alpha, in units of disintegrations per minute (or microcuries) per 100 square centimeters removable and fixed for surfaces, microcuries per milliliter for water, and picocuries per gram for solids such as soils or concrete; and

(B) Specify the survey instrument(s) used and certify that each instrument is properly calibrated and tested.

(2)(i) In addition to the information required under paragraphs (c)(1)(iv) and (v) of this section, the licensee shall submit a plan for completion of decommissioning if the procedures necessary to carry out decommissioning have not been previously approved by the NRC and could increase potential health and safety impacts to workers or to the public such as in any of the following cases:

(A) Procedures would involve techniques not applied routinely during cleanup or maintenance operations; or

(B) Workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation; or

(C) Procedures could result in significantly greater airborne concentrations of radioactive materials than are present during operation; or

(D) Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operation.

(ii) Procedures with potential health and safety impacts may not be carried out prior to approval of the decommissioning plan.

(iii) The proposed decommissioning plan, if required by paragraph (c)(2)(i) of this section or by license condition, must include—

(A) Description of planned decommissioning activities;

(B) Description of methods used to assure protection of workers and the environment against radiation hazards during decommissioning;

(C) A description of the planned final radiation survey; and

(D) An updated detailed cost estimate for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and plan for assuring the availability of adequate funds for completion of decommissioning.

(iv) The proposed decommissioning plan will be approved by the Commission if the information therein demonstrates that the decommissioning will be completed as soon as is reasonable and that the health and safety of workers and the public will be adequately protected.

(3) Upon approval of the decommissioning plan by the Commission, the licensee shall complete decommissioning in accordance with the approved plan. As a final step in decommissioning, the licensee shall again submit the information required in paragraph (c)(1)(iv) of this section and

shall certify the disposition of accumulated wastes from decommissioning.

(j) If the information submitted under paragraph (c)(1)(v) or (c)(3) of this section does not adequately demonstrate that the premises are suitable for release for unrestricted use, the Commission will inform the licensee of the appropriate further actions required for termination of license.

(e) Each specific license continues in effect, beyond the expiration date if necessary, with respect to possession of residual source material present as contamination until the Commission notifies the licensee in writing that the license is terminated. During this time, the licensee shall—

(1) Limit actions involving source material to those related to decommissioning; and

(2) Continue to control entry to restricted areas until they are suitable for release for unrestricted use and the Commission notifies the licensee in writing that the license is terminated.

(f) Specific licenses will be terminated by written notice to the licensee when the Commission determines that—

(1) Source material has been properly disposed;

(2) Reasonable effort has been made to eliminate residual radioactive contamination, if present; and

(3)(i) A radiation survey has been performed which demonstrates that the premises are suitable for release for unrestricted use; or

(ii) Other information submitted by the licensee is sufficient to demonstrate that the premises are suitable for release for unrestricted use.

PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

12. The authority citation for Part 50 is revised to read as follows:

Authority: Secs. 102, 103, 104, 105, 161, 162, 183, 106, 169, 66 Stat. 935, 937, 938, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 1244, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2201, 2202, 2233, 2236, 2239, 2282); sec. 201, as amended, 202, 206, 66 Stat. 127, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846).

Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 50.10 also issued under secs. 101, 185, 66 Stat. 936, 935, as amended (42 U.S.C. 2131, 2235); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.23, 50.35, 50.35, and 50.56 also issued under sec. 185, 66 Stat. 955 (42 U.S.C. 2235). Sections 50.33a, 50.53a and Appendix Q also issued under sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.34 and 50.34 also issued under sec. 204, 66 Stat. 1245 (42 U.S.C. 5844).

Sections 50.58, 50.91, and 50.92 also issued under Pub. L. 97-415, 96 Stat. 2073 (42 U.S.C. 2201). Section 50.78 also issued under sec. 122, 66 Stat. 939 (42 U.S.C. 2132). Sections 50.80-50.81 also issued under sec. 184, 66 Stat. 954, as amended (42 U.S.C. 2234). Section 50.103 also issued under sec. 108, 66 Stat. 939, as amended (42 U.S.C. 2138). Appendix F also issued under sec. 187, 66 Stat. 953 (42 U.S.C. 2237).

For the purposes of sec. 223, 66 Stat. 958, as amended (42 U.S.C. 2273): §§ 50.10 (a), (b), and (c), 50.44, 50.46, 50.48, 50.54, and 50.80(a) are issued under sec. 161b, 66 Stat. 948, as amended (42 U.S.C. 2201(b)); §§ 50.10 (b) and (c), and 50.34 are issued under sec. 161, 66 Stat. 949, as amended (42 U.S.C. 2201(i)); and §§ 50.9, 50.55(e), 50.59(b), 50.70, 50.71, 50.72, 50.73, 50.78 are issued under sec. 167, 66 Stat. 950, as amended (42 U.S.C. 2201(o)).

13. A new definition is added to § 50.2 in appropriate alphabetical order to read as follows:

§ 50.2 Definitions.

"Decommission" means to remove (as 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.

14. Section 50.33 is amended by republishing the introductory text of paragraph (f), revising paragraphs (f)(2) and (4), and adding paragraph (k) to read as follows:

§ 50.33 Contents of applications; general information.

Each application shall state:

(f) Except for an electric utility applicant for a license to operate a utilization facility of the type described in § 50.21(b) or § 50.22, information sufficient to demonstrate to the Commission the financial qualification of the applicant to carry out, in accordance with regulations in this chapter, the activities for which the permit or license is sought. As applicable, the following should be provided:

(2) If the application is for an operating license, the applicant shall submit information that demonstrates the applicant possesses or has reasonable assurance of obtaining the funds necessary to cover estimated operation costs for the period of the license. The applicant shall submit estimates for total annual operating costs for each of the first five years of operation of the facility. The applicant shall also indicate the source(s) of funds to cover these costs. An application to renew or extend the term of an

operating license must include the same financial information as is required in an application for an initial license.

(4) The Commission may request an established entity or newly-formed entity to submit additional or more detailed information respecting its financial arrangements and status of funds if the Commission considers this information appropriate. This may include information regarding a licensee's ability to continue the conduct of the activities authorized by the license and to decommission the facility.

(k) (1) For an application for an operating license for a production or utilization facility, information in the form of a report, as described in § 50.75 of this part, indicating how reasonable assurance will be provided that funds will be available to decommission the facility.

(2) On or before July 26, 1990, each holder of an operating license for a production or utilization facility in effect on July 27, 1990, shall submit information in the form of a report as described in § 50.75 of this part, indicating how reasonable assurance will be provided that funds will be available to decommission the facility.

15. Section 50.51 is revised to read as follows:

§ 50.51 Duration of license, renewal.

Each license will be issued for a fixed period of time to be specified in the license but in no case to exceed 40 years from the date of issuance. Where the operation of a facility is involved the Commission will issue the license for the term requested by the applicant or for the estimated useful life of the facility if the Commission determines that the estimated useful life is less than the term requested. Where construction of a facility is involved, the Commission may specify in the construction permit the period for which the license will be issued if approved pursuant to § 50.56. Licenses may be renewed by the Commission upon the expiration of the period. Application for termination of license is to be made pursuant to § 50.82.

16. A new § 50.75 is added to read as follows:

§ 50.75 Reporting and recordkeeping for decommissioning planning.

(a) This section establishes requirements for indicating to NRC how reasonable assurance will be provided that funds will be available for decommissioning. For electric utilities it consists of a step-wise procedure as

provided in paragraphs (b), (c), (e), and (f) of this section. Funding for decommissioning of electric utilities is also subject to the regulation of agencies (e.g., Federal Energy Regulatory Commission (FERC) and State Public Utility Commissions) having jurisdiction over rate regulation. The requirements of this section, in particular paragraph (c), 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.

(b) Each electric utility applicant for or holder of an operating license for a production or utilization facility of the type and power level specified in paragraph (c) of this section shall submit a decommissioning report, as required by § 50.33(k) of this part containing a certification that financial assurance for decommissioning will be provided in an amount which may be more but not less than the amount stated in the table in paragraph (c)(1) of this section, adjusted annually using a rate at least equal to that stated in paragraph (c)(2) of this section, by one or more of the methods described in paragraph (e) of this section as acceptable to the Commission. The amount stated in the applicant's or licensee's certification may be based on a cost estimate for decommissioning the facility. As part of the certification, a copy of the financial instrument obtained to satisfy the requirements of paragraph (e) of this section is to be submitted to NRC.

(c) Table of minimum amounts (January 1986 dollars) required to demonstrate reasonable assurance of funds for decommissioning by reactor type and power level. P (in MWt): adjustment factor.¹

Millions	
(1)(i) For a PWR:	
greater than or equal to 3400 MWt.....	\$ 15
between 1200 MWt and 3400 MWt (For a PWR of less than 1200 MWt, use P=1200 MWt).....	$\$15 + 0.0088P$
(ii) For a BWR:	
greater than or equal to 3400 MWt.....	\$135
between 1200 MWt and 3400 MWt (For a BWR of less than 1200 MWt, use P=1200 MWt).....	$\$135 + 0.0097P$

¹ Adjustments are based on activities related to the decommissioning of a reactor, in § 50.1 of this part and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to thoroughly decontaminate.

(2) An adjustment factor at least equal to $0.85L + 0.13E + 0.22B$ is to be used where L and E are escalation factors for labor and energy, respectively, and are to be taken from regional data of U.S. Department of Labor Bureau of Labor Statistics and B is an escalation factor for waste burial and is to be taken from NRC report NUREG-1307, "Report on Waste Burial Charges."

(d) Each non-electric utility applicant for or holder of an operating license for a production or utilization facility shall submit a decommissioning report as required by § 50.33(k) of this part containing a cost estimate for decommissioning the facility, an indication of which method or methods described in paragraph (e) of this section as acceptable to the Commission will be used to provide funds for decommissioning, and a description of the means of adjusting the cost estimate and associated funding level periodically over the life of the facility.

(e)(1) As provided in paragraphs (c)(2) and (3) of this section, financial assurance is to be provided by the following methods:

(i) Prepayment. Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets such that the amount of funds would be sufficient to pay decommissioning costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.

(ii) External sinking fund. An external sinking fund is a fund established and maintained by setting funds aside periodically in an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of funds would be sufficient to pay decommissioning costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.

(iii) A surety method, insurance, or other guarantee method. These methods guarantee that decommissioning costs will be paid should the licensee default. A surety method may be in the form of a surety bond, letter of credit, or line of credit. Any surety method or insurance used to provide financial insurance for decommissioning must contain the following conditions:

(A) The surety method or insurance must be open-ended or, if written for a specified term, such as five years, must

be renewed automatically unless 90 days or more prior to the renewal date, the issuer notifies the Commission, the beneficiary, and the licensee of its intention not to renew. The surety or insurance must also provide that the full face amount be paid to the beneficiary automatically prior to the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the Commission within 30 days after receipt of notification of cancellation.

(B) The surety or insurance must be payable to a trust established for decommissioning costs. The trustee and trust must be acceptable to the Commission. An acceptable trustee includes an appropriate State or Federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(C) The surety method or insurance must remain in effect until the Commission has terminated the license.

(2) For a licensee other than an electric utility, acceptable methods of providing financial assurance for decommissioning are—

(i) Prepayment;
(ii) An external sinking fund, in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund.

(iii) A surety method, insurance, or other guarantee method. A parent company guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in Appendix A of 10 CFR Part 30. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of this section.

(iv) In the case of Federal, State, or local government licensees, a statement of intent containing a cost estimate for decommissioning, and indicating that funds for decommissioning will be obtained when necessary.

(3) For an electric utility, acceptable methods of providing financial assistance for decommissioning are—

(i) Prepayment;
(ii) An external sinking fund in which deposits are made at least annually;
(iii) A surety method or insurance; and

(iv) In the case of Federal government licensees, a statement of intent containing a cost estimate for decommissioning or an amount based on paragraph (c) of this section, and

indicating if it funds for decommissioning will be obtained when necessary.

(f) Each licensee shall at or about 5 years prior to the projected end of operation 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. Factors to be considered in submitting this information include—

(1) The decommissioning alternative anticipated to be used. The requirements of § 50.82(b)(1) must be considered at this time;

(2) Major technical actions necessary to carry out decommissioning safely;

(3) The current situation with regard to disposal of high-level and low-level radioactive waste;

(4) Residual radioactivity criteria;

(5) Other site specific factors which could affect decommissioning planning and cost.

If necessary, this submittal shall also include plans for adjusting levels of funds assured for decommissioning to demonstrate that a reasonable level of assurance will be provided that funds will be available when needed to cover the costs of decommissioning.

(g) Each licensee shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission. If records of relevant information are kept for other purposes, reference to these records and their locations may be used. Information the Commission considers important to decommissioning consists of—

(1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when significant contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

(2) As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination. If required drawings are referenced, each relevant document need not be indexed individually. If

drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations.

(3) Records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

17. Section 50.82 is revised to read as follows:

§ 50.82 Application for termination of license.

(a) Any licensee may apply to the Commission for authority to surrender a license voluntarily and to decommission the facility. For a facility that permanently ceases operation after July 27, 1988, this application must be made within two years following permanent cessation of operations, and in no case later than one year prior to expiration of the operating license. Each application for termination of license must be accompanied, or preceded, by a proposed decommissioning plan. For a facility which has permanently ceased operation prior to July 27, 1988, requirements for contents of the decommissioning plan as specified in paragraphs (b) through (d) of this section may be modified with approval of the Commission to reflect the fact that the decommissioning process has been initiated previously.

(b) The proposed decommissioning plan must include—

(1) The choice of the alternative for decommissioning with a description of activities involved.

(i) For an electric utility licensee, an alternative is acceptable if it provides for completion of decommissioning within 60 years. Consideration will be given to an alternative which provides for completion of decommissioning beyond 60 years only when necessary to protect the public health and safety. Factors to be considered in evaluating an alternative which provides for completion of decommissioning beyond 60 years are set out in paragraph (b)(1)(iii) of this section.

(ii) For a licensee other than an electric utility, an alternative is acceptable if it provides for completion of decommissioning without significant delay. Consideration will be given to an alternative which provides for delayed completion of decommissioning only when necessary to protect the public health and safety. Factors to be considered in evaluating an alternative which provides for delayed completion of decommissioning are set out in paragraph (b)(1)(iii) of this section.

(iii) Factors to be considered in making the evaluations required by paragraphs (b)(1)(i) and (b)(1)(ii) of this section include unavailability of waste disposal capacity and other site specific factors affecting the licensee's capability to carry out decommissioning safely, including presence of other nuclear facilities at the site.

(2) A description of controls and limits on procedures and equipment to protect occupational and public health and safety;

(3) A description of the planned final radiation survey;

(4) An updated cost estimate for the chosen alternative for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and plan for assuring the availability of adequate funds for completion of decommissioning.

(5) A description of technical specifications, quality assurance provisions and physical security plan provisions in place during decommissioning.

(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 statement of intent be maintained in accordance with the criteria of § 50.75(e), and

(2) Means be included for adjusting cost estimates and associated funding levels over the storage or surveillance period.

(d) For decommissioning plans in which the major dismantlement activities are delayed by first placing the facility in storage, planning for these delayed activities may be less detailed. Updated detailed plans must be submitted and approved prior to the start of these activities.

(e) If the decommissioning plan demonstrates that the decommissioning will be performed in accordance with the regulations in this chapter and will not be inimical to the common defense and security or to the health and safety of the public, and after notice to interested persons, the Commission will approve the plan subject to such conditions and limitations as it deems appropriate and necessary and issue an order authorizing the decommissioning.

(f) The Commission will terminate the license if it determines that—

(1) The decommissioning has been performed in accordance with the approved decommissioning plan and the order authorizing decommissioning; and

(2) The terminal radiation survey and associated documentation demonstrates that the facility and site are suitable for release for unrestricted use.

PART 51—ENVIRONMENTAL PROTECTION REGULATIONS FOR DOMESTIC LICENSING AND RELATED REGULATORY FUNCTIONS

18. The authority citation for Part 51 continues to read as follows:

Authority: Sec. 161, 68 Stat. 948, as amended (42 U.S.C. 2201); sec. 201, as amended, 202, 68 Stat. 1242, as amended, 1344 (42 U.S.C. 5841, 5842).

Subpart A also issued under National Environmental Policy Act of 1969, sec. 102, 104, 105, 83 Stat. 353-354, as amended (42 U.S.C. 4332, 4334, 4335); and Pub. L. 95-604, Title II, 92 Stat. 3033-3041, Section 51.22 also issued under sec. 274, 73 Stat. 668, as amended by 92 Stat. 3036-3038 (42 U.S.C. 2021).

§ 51.20 (Amended)

19. Section 51.20 is amended by removing and reserving paragraphs (b) (5) and (10).

20. In § 51.53, paragraph (b) is revised to read as follows:

§ 51.53 Supplement to environmental report.

(b) *Post operating license stage.* Each applicant for a license amendment authorizing the decommissioning of a production or utilization facility covered by § 51.20 and each applicant for a license or license amendment to store spent fuel at a nuclear power reactor after expiration of the operating license for the nuclear power reactor shall submit with its application the number of copies, as specified in § 51.55, of a separate document, entitled "Supplement to Applicant's Environmental Report—Post Operating License Stage," which will update "Applicant's Environmental Report—Operating License Stage," as appropriate, to reflect any new information or significant environmental change associated with the applicant's proposed decommissioning activities or with the applicant's proposed activities with respect to the planned storage of spent fuel. Unless otherwise required by the Commission, in accordance with the generic determination in § 51.23(a) and the provisions in § 51.23(b), the applicant shall only address the environmental impact of spent fuel storage for the term of the license applied for. The "Supplement to Applicant's Environmental Report—Post

Operating License Stage" may incorporate by reference any information contained in "Applicant's Environmental Report—Construction Permit Stage," "Supplement to Applicant's Environmental Report—Operating License Stage," final environmental impact statement, supplement to final environmental impact statement of records of decision previously prepared in connection with the construction permit or operating license.

21. In § 51.55, paragraph (a) is revised to read as follows:

§ 51.55 Environmental report—number of copies; distribution.

(a) Each applicant for a license to construct and operate a production or utilization facility covered by paragraphs (b)(1), (b)(2), (b)(3) or (b)(4) of § 51.20 and each applicant for a license amendment authorizing the decommissioning of a production or utilization facility covered by § 51.20, and each applicant for a license or license amendment to store spent fuel at a nuclear power reactor after expiration of the operating license for the nuclear power reactor shall submit to the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate, forty-one (41) copies of an environmental report, or any supplement to an environmental report. The applicant shall retain an additional 109 copies of the environmental report or any supplement to the environmental report for distribution to parties and Boards in the NRC proceeding, Federal, State, and local officials and any affected Indian tribes, in accordance with written instructions issued by the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate.

22. Section 51.60 is amended by revising paragraph (a) to read as follows:

§ 51.60 Environmental report—materials licenses.

(a) Each applicant for a license or other form of permission, or an amendment to or renewal of a license or other form of permission issued pursuant to Parts 30, 32, 33, 34, 35, 39, 40, 61, 70 and/or 72 of this chapter, and covered by paragraphs (b)(1) through (b)(6) of this section, shall submit with its application to the Director of Nuclear Material Safety and Safeguards the number of copies, as specified in § 51.56, of a separate document, entitled "Supplement to Applicant's Environmental Report" or

"Supplement to Applicant's Environmental Report," as appropriate. The "Applicant's Environmental Report" shall contain the information specified in § 51.45. If the application is for an amendment to or a renewal of a license or other form of permission for which the applicant has previously submitted an environmental report, the supplement to applicant's environmental report may be limited to incorporating by reference, updating or supplementing the information previously submitted to reflect any significant environmental change, including any significant environmental change resulting from operational experience or a change in operations or proposed decommissioning activities.

23. In § 51.95, paragraph (b) is revised to read as follows:

§ 51.95 Supplement to final environmental impact statement.

(b) *Post operating license stage.* In connection with the amendment of an operating license to authorize the decommissioning of a production or utilization facility covered by § 51.20 or with the issuance, amendment or renewal of a license to store spent fuel at a nuclear power reactor after expiration of the operating license for the nuclear power reactor, the NRC staff will prepare a supplemental environmental impact statement for the post operating license stage or an environmental assessment, as appropriate, which will update the prior environmental review. The supplement or assessment may incorporate by reference any information contained in the final environmental impact statement, the supplement to the final environmental impact statement—operating license stage, or in the records of decision prepared in connection with the construction permit or the operating license for that facility. The supplement will include a request for comments as provided in § 51.73. Unless otherwise required by the Commission, in accordance with the generic determination in § 51.23(a) and the provisions of § 51.23(b), a supplemental environmental impact statement for the post operating license stage or an environmental assessment, as appropriate, will address the environmental impacts of spent fuel storage only for the term of the license, license amendment or license renewal applied for.

PART 70—DOMESTIC LICENSING OF SPECIAL NUCLEAR MATERIAL

24. The authority citation for Part 70 is revised to read as follows:

Authority: Secs. 51, 53, 161, 162, 163, 68 Stat. 929, 930, 948, 953, 954, as amended; sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2071, 2073, 2201, 2232, 2233, 2282); sec. 201, as amended, 202, 204, 206, 68 Stat. 1242, as amended, 1244, 1245, 1246 (42 U.S.C. 5841, 5842, 5845, 5846).

Section 70.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 70.21(g) also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Section 70.31 also issued under sec. 57d, Pub. L. 93-377, 88 Stat. 475 (42 U.S.C. 2077). Sections 70.36 and 70.44 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 70.61 also issued under sec. 186, 187, 68 Stat. 955 (42 U.S.C. 2236, 2237). Section 70.62 also issued under sec. 108, 68 Stat. 938, as amended (42 U.S.C. 2138).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273), §§ 70.3, 70.19(c), 70.21(c), 70.22(a), (b), (d)-(k), 70.24(a) and (b), 70.32(a)(3), (5), (6), (d), and (i), 70.36, 70.39(b) and (c), 70.41(a), 70.42(a) and (c), 70.56, 70.57(b), (c), and (d), 70.58(a)-(g)(3), and (h)-(i) are issued under sec. 181b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)) § 70.7, 70.20(a) and (d), 70.20b(c) and (e), 70.21(c), 70.24(b), 70.22(a)(8), (c), (d), (e), and (g), 70.36, 70.51(c)-(g), 70.56, 70.57(b) and (d), and 70.58(a)-(g)(3), and (h)-(i) are issued under sec. 161, 68 Stat. 949, as amended (42 U.S.C. 2201(i)) and §§ 70.5, 70.9, 70.20b(d) and (e), 70.38, 70.51(b) and (i), 70.52, 70.53, 70.54, 70.55, 70.58(g)(4), (k), and (l), 70.59, and 70.60(b) and (c) are issued under sec. 161a, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

25. Section 70.4 is amended by adding a new paragraph (bb) to read as follows:

§ 70.4 Definitions.

(bb) "Decommission" means to remove (as 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.

26. Section 70.22 is amended by adding a new paragraph (a)(9) to read as follows:

§ 70.22 Contents of applications.

(a) Each application for a license shall contain the following information:

(9) As provided by § 70.25, certain applications for specific licenses filed under this part must contain a proposed decommissioning funding plan or a certification of financial assurance for decommissioning. In the case of renewal applications submitted before July 27, 1990, this submittal may follow the renewal application but must be submitted on or before — — —

27. A new § 70.25 is added to read as follows:

§ 70.25 Financial assurance and recordkeeping for decommissioning.

(a) Each applicant for a specific license authorizing the possession and use of unsealed special nuclear material in quantities exceeding 10^5 times the applicable quantities set forth in Appendix C to 10 CFR Part 20 shall submit a decommissioning funding plan as described in paragraph (e) of this section. A decommissioning funding plan must also be submitted when a combination of isotopes is involved if R, divided by 10^5 is greater than 1 (unity rule), where R is defined here as the sum of the ratios of the quantity of each isotope to the applicable value in Appendix C.

(b) Each applicant for a specific license authorizing possession and use of unsealed special nuclear material in quantities specified in paragraph (d) of this section shall either—

(1) Submit a decommissioning funding plan as described in paragraph (e) of this section; or

(2) Submit a certification that financial assurance for decommissioning has been provided in the amount prescribed by paragraph (d) of this section using one of the methods described in paragraph (f) of this section. For an applicant, this certification may state that the appropriate assurance will be obtained after the application has been approved and the license issued but prior to the receipt of licensed material. As part of the certification, a copy of the financial instrument obtained to satisfy the requirements of paragraph (e) of this section is to be submitted to NRC.

(c) (1) Each holder of a specific license issued on or after July 27, 1990, which is of a type described in paragraph (a) or (b) of this section, shall provide financial assurance for decommissioning in accordance with the criteria set forth in this section.

(2) Each holder of a specific license issued before July 27, 1990, and of a type described in paragraph (a) of this section shall submit, on or before July 27, 1990, a decommissioning funding plan or certification of financial assurance for decommissioning in an amount at least equal to \$750,000 in accordance with the criteria set forth in this section. If the licensee submits the certification of financial assurance rather than a decommissioning funding plan at this time, the licensee shall include a decommissioning funding plan in any application for license renewal.

(3) Each holder of a specific license issued before July 27, 1990, and of a type

described in paragraph (b) of this section shall submit, on or before July 27, 1990, a certification of financial assurance for decommissioning or a decommissioning funding plan in accordance with the criteria set forth in this section.

(d) Table of required amounts of financial assurance for decommissioning by quantity of material.

greater than 10^4 but less than or equal to 10^5 times the applicable quantities of Appendix C of Part 20. (For a combination of isotopes, if R, as defined in § 70.25(a), divided by 10^5 is greater than 1 but R divided by 10^5 is less than or equal to 1.)	\$750,000
greater than 10^5 but less than or equal to 10^6 times the applicable quantities of Appendix C of Part 20. (For a combination of isotopes, if R, as defined in § 70.25(a), divided by 10^6 is greater than 1 but R divided by 10^6 is less than or equal to 1.)	\$150,000

(e) Each decommissioning funding plan must contain a cost estimate for decommissioning and a description of the method of assuring funds for decommissioning from paragraph (f) of this section, including means of adjusting cost estimates and associated funding levels periodically over the life of the facility.

(f) Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) Prepayment. Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets such that the amount of funds would be sufficient to pay decommissioning costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.

(2) A surety method, insurance, or other guarantee method. These methods guarantee that decommissioning costs will be paid should the licensee default. A surety method may be in the form of a surety bond, letter of credit, or line of credit. A parent company guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in Appendix A of 10 CFR Part 30. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of this section. Any surety method or insurance used to provide financial

assurance for decommissioning must contain the following conditions:

(i) The surety method or insurance must be open-ended or, if written for a specified term, such as five years, must be renewed automatically unless 90 days or more prior to the renewal date, the issuer notifies the Commission, the beneficiary, and the licensee of its intention not to renew. The surety method or insurance must also provide that the full face amount be paid to the beneficiary automatically prior to the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the Commission within 30 days after receipt of notification of cancellation.

(ii) The surety method or insurance must be payable to a trust established for decommissioning costs. The trustee and trust must be acceptable to the Commission. An acceptable trustee includes an appropriate State or Federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(iii) The surety method or insurance must remain in effect until the Commission has terminated the license.

(3) An external sinking fund in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund. An external sinking fund is a fund established and maintained by setting aside funds periodically in an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of funds would be sufficient to pay decommissioning costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. The surety or insurance provisions must be as stated in paragraph (f)(2) of this section.

(4) In the case of Federal, State, or local government licensees, a statement of intent containing a cost estimate for decommissioning or an amount based on the Table in paragraph (d) of this section, and indicating that funds for decommissioning will be obtained when necessary.

(5) Each person licensed under this part shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission. If records of relevant information are kept for other purposes, reference to these

records and their locations may be used. Information the Commission considers important to decommissioning consists of—

(1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

(2) As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination. If required drawings are referenced, each relevant document need not be indexed individually. If drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations.

(3) Records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

28. Section 70.38 is revised to read as follows:

§ 70.38 Expiration and termination of licenses.

(a) Except as provided in § 70.33(b) and paragraph (e) of this section, each specific license expires at the end of the day, in the month and year stated in the license.

(b) Each licensee shall notify the Commission promptly, in writing under § 70.5, and request termination of the license when the licensee decides to terminate all activities involving materials authorized under the license. This notification and request for termination of the license must include the reports and information specified in paragraphs (c)(1)(iv) and (v) of this section and a plan for completion of decommissioning if required by paragraph (c)(2) of this section or by license condition.

(c)(1) If a licensee does not submit an application for license under § 70.33, the licensee shall on or before the expiration date specified in the license—

(i) Terminate use of special nuclear material;

(ii) Remove radioactive contamination to the extent practicable except for those procedures covered by paragraph (c)(2)(i) of this section;

(iii) Properly dispose of special nuclear material;

(iv) Submit a completed form NRC-314, which certifies information concerning the disposition of materials; and

(v) Conduct a radiation survey of the premises where the licensed activities were carried out and submit a report of the results of this survey, unless the licensee demonstrates that the premises are suitable for release for unrestricted use in some other manner. The licensee shall, as appropriate—

(A) Report levels of radiation in units of microrads per hour of beta and gamma radiation at one centimeter and gamma radiation at one meter from surfaces, and report levels of radioactivity, including alpha, in units of disintegrations per minute (or microcuries) per 100 square centimeters removable and fixed for surfaces, microcuries per milliliter for water, and picocuries per gram for solids such as soils or concrete; and

(B) Specify the survey instrument(s) used and certify that each instrument is properly calibrated and tested.

(2)(i) In addition to the information required under paragraphs (c)(1)(iv) and (v) of this section, the licensee shall submit a plan for completion of decommissioning if the procedures necessary to carry out decommissioning have not been previously approved by the NRC and could increase potential health and safety impacts to workers or to the public such as in any of the following cases:

(A) Procedures would involve techniques not applied routinely during cleanup or maintenance operations; or

(B) Workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation; or

(C) Procedures could result in significantly greater airborne concentrations of radioactive materials than are present during operation; or

(D) Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operation.

(ii) Procedures with potential health and safety impacts may not be carried out prior to approval of the decommissioning plan.

(iii) The proposed decommissioning plan, if required by paragraph (c)(2)(i) of

this section or by license condition, must include—

- (A) Description of planned decommissioning activities;
- (B) Description of methods used to assure protection of workers and the environment against radiation hazards during decommissioning;
- (C) A description of the planned final radiation survey; and
- (D) An updated detailed cost estimate for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and plan for assuring the availability of adequate funds for completion of decommissioning.

(E) A description of the physical security plan and material control and accounting plan provisions in place during decommissioning.

(iv) The proposed decommissioning plan will be approved by the Commission if the information therein demonstrates that the decommissioning will be completed as soon as is reasonable and that the health and safety of workers and the public will be adequately protected.

(v) Upon approval of the decommissioning plan by the Commission, the licensee shall complete decommissioning in accordance with the approved plan. As a final step in decommissioning, the licensee shall again submit the information required in paragraph (c)(1)(v) of this section and shall certify the disposition of accumulated wastes from decommissioning.

(d) If the information submitted under paragraphs (c)(1)(v) or (c)(3) of this section does not adequately demonstrate that the premises are suitable for release for unrestricted use, the Commission will inform the licensee of the appropriate further actions required for termination of license.

(e) Each specific license continues in effect, beyond the expiration date if necessary, with respect to possession of residual special nuclear material present as contamination until the Commission notifies the licensee in writing that the license is terminated. During this time, the license shall—

- (1) Limit actions involving special nuclear material to those related to decommissioning; and
- (2) Continue to control entry to restricted areas until they are suitable for release for unrestricted use and the Commission notifies the licensee in writing that the license is terminated.

(f) Specific licenses will be terminated by written notice to the licensee when the Commission determines that—

- (1) Special nuclear material has been properly disposed;

(2) Reasonable effort has been made to eliminate residual radioactive contamination, if present; and

(3) (i) A radiation survey has been performed which demonstrates that the premises are suitable for release for unrestricted use; or

(ii) Other information submitted by the licensee is sufficient to demonstrate that the premises are suitable for release for unrestricted use.

PART 72—LICENSING REQUIREMENTS FOR THE STORAGE OF SPENT FUEL IN AN INDEPENDENT SPENT FUEL STORAGE INSTALLATION

29. The authority citation for Part 72 is revised to read as follows:

Authority: Secs. 51, 53, 57, 62, 63, 65, 69, 81, 161, 182, 183, 184, 186, 187, 189, 68 Stat. 929, 930, 932, 933, 934, 935, 946, 953, 954, 955, as amended; sec. 204, 63 Stat. 444, as amended (42 U.S.C. 2071, 2073, 2077, 2082, 2083, 2086, 2099, 2111, 2201, 2251, 2233, 2234, 2236, 2237, 2238, 2282); sec. 274, Pub. L. 95-373, 73 Stat. 688, as amended (42 U.S.C. 2021; sec. 201, as amended, 202, 206, 68 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851); sec. 102, Pub. L. 91-190, 63 Stat. 653 (42 U.S.C. 4332).

Section 72.34 also issued under sec. 189, 68 Stat. 955 (42 U.S.C. 2279); sec. 134, Pub. L. 97-425, 96 Stat. 2230 (42 U.S.C. 10154).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); §§ 72.6, 72.14, 72.15, 72.17(d), 72.19, 72.33(b)(1), (4), 181, (e), (f), and 72.38(a) are issued under sec. 51b, 68 Stat. 946, as amended (42 U.S.C. 2201(b)); §§ 72.10, 72.15, 72.17(d), 72.33(c), (d)(1), (2), (e), 72.81, 72.83, 72.84(a), and 72.91 are issued under sec. 161, 68 Stat. 949, as amended (42 U.S.C. 2201(i)); and §§ 72.94, 72.33(b)(3), (d)(3), (f), 72.35(b), 72.50-72.52, 72.53(a), 72.54(a), 72.55, 72.56, 72.80(c), and 72.84(b) are issued under sec. 181a, 68 Stat. 950, as amended (42 U.S.C. 2201(i)).

30. Section 72.3 is amended by adding a new paragraph (y) to read as follows:

§ 72.3 Definitions.

(y) "Decommission" means to remove (as 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.

31. Section 72.14 is amended by revising paragraph (e)(3) to read as follows:

§ 72.14 Contents of application: General and financial information.

(e) * * *

(3) Estimated decommissioning costs, and the necessary financial arrangements to provide reasonable assurance prior to licensing that

decommissioning will be carried out after the removal of spent fuel from storage.

32. Section 72.18 is revised by revising the section heading and paragraph (b) and by adding new paragraphs (c) and (d) to read as follows:

§ 72.18 Decommissioning planning, including financing and recordkeeping.

(b) The decommissioning funding plan must contain information on how reasonable assurance will be provided that funds will be available to decommission the ISFSI. This information must include a cost estimate for decommissioning and a description of the method of assuring funds for decommissioning from paragraph (c) of this section, including means of adjusting cost estimates and associated funding levels periodically over the life of the ISFSI.

(c) Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) Prepayment. Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets such that the amount of funds would be sufficient to pay decommissioning costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.

(2) A surety method, insurance, or other guarantee method. These methods guarantee that decommissioning costs will be paid should the licensee default. A surety method may be in the form of a surety bond, letter of credit, or line of credit. A parent company guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in Appendix A of 10 CFR Part 30. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of this section. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

(i) The surety method or insurance must be open-ended or, if written for a specified term, such as five years, must be renewed automatically unless 90 days or more prior to the renewal date, the issuer notifies the Commission, the beneficiary, and the licensee of its intention not to renew. The surety method or insurance must also provide that the full face amount be paid to the beneficiary automatically prior to the

expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the Commission within 30 days after receipt of notification of cancellation.

(ii) The surety method or insurance must be payable to a trust established for decommissioning costs. The trustee and trust must be acceptable to the Commission. An acceptable trustee includes an appropriate State or Federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(iii) The surety of insurance must remain in effect until the Commission has terminated the license.

(3) An external sinking fund in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund. An external sinking fund is a fund established and maintained by setting aside funds periodically in an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of funds would be sufficient to pay decommissioning costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. The surety or insurance provision must be as stated in paragraph (c)(2) of this section.

(4) In the case of Federal, State, or local government licensees, a statement of intent containing a cost estimate for decommissioning, and indicating that funds for decommissioning will be obtained when necessary.

(5) In the case of electric utility licensees, the methods of § 50.74(e)(1) and (3) of this chapter.

(d) Each licensee shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission. If records of relevant information are kept for other purposes, reference to these records and their locations may be used. Information the Commission considers important to decommissioning consists of—

(1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances

when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

(2) As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored, and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination. If required drawings are referenced, each relevant document need not be indexed individually. If drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations.

(3) Records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

33. Section 72.38 is revised to read as follows:

§ 72.38 Application for termination of license.

(a) Any licensee may apply to the Commission for authority to surrender a license voluntarily and to decommission the ISFSI. This application must be made within two years following permanent cessation of operations, and in no case later than one year prior to expiration of the license. Each application for termination of license must be accompanied, or preceded, by a proposed final decommissioning plan.

(b) The proposed final decommissioning plan must include—

(1) The choice of the alternative for decommissioning with a description of activities involved. An alternative is acceptable if it provides for completion of decommissioning without significant delay. Consideration will be given to an alternative which provides for delayed completion of decommissioning only when necessary to protect the public health and safety. Factors to be considered in evaluating an alternative which provides for delayed completion of decommissioning include unavailability of waste disposal capacity and other site specific factors

affecting the licensee's capability to carry out decommissioning safely, including presence of other nuclear facilities at the site.

(2) A description of controls and limits on procedures and equipment to protect occupational and public health and safety;

(3) A description of the planned final radiation survey; and

(4) An updated detailed cost estimate for the chosen alternative for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and plan for assuring the availability of adequate funds for completion of decommissioning including means for adjusting cost estimates and associated funding levels over any storage or surveillance period.

(5) A description of technical specifications and quality assurance provisions in place during decommissioning.

(c) For final decommissioning plans in which the major dismantlement activities are delayed by first placing the ISFSI in storage, planning for these delayed activities may be less detailed. Updated detailed plans must be submitted and approved prior to the start of such activities.

(d) If the final decommissioning plan demonstrates that the decommissioning will be performed in accordance with the regulations in this chapter and will not be inimical to the common defense and security or to the health and safety of the public, and after notice to interested persons, the Commission will approve the plan subject to such conditions and limitations as it deems appropriate and necessary and issue an order authorizing the decommissioning.

(e) The Commission will terminate the license if it determines that—

(1) The decommissioning has been performed in accordance with the approved final decommissioning plan and the order authorizing decommissioning; and

(2) The terminal radiation survey and associated documentation demonstrates that the ISFSI and site are suitable for release for unrestricted use.

Dated at Rockville, MD, this 17th day of June 1988.

For the Nuclear Regulatory Commission,
Samuel J. Chalk,
Secretary of the Commission.

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