RULEMAKING ISSUE
(Affirmation)

October 1, 2008 SECY-08-0144

FOR: The Commissioners

FROM: R. W. Borchardt
Executive Director for Operations

SUBJECT: FINAL RULE: DECOMMISSIONING PLANNING
(10 CFR PARTS 20, 30, 40, 50, 70, AND 72; RIN: 3150-AH45)

PURPOSE:

The purpose of this paper is to request Commission approval to publish a final rule in the *Federal Register* that would amend Parts 20, 30, 40, 50, 70, and 72 of Title 10 of the *Code of Federal Regulations* (10 CFR) to improve licensees' decommissioning planning activities during active facility operations, thereby reducing the likelihood that any currently operating facility will become a legacy site.

SUMMARY:

This final rule adds a new 10 CFR 20.1406(c) requiring licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, including subsurface soil and ground water. This rule amends 10 CFR 20.1501 to require licensees to survey residual radioactivity that may be a radiological hazard at the site, including in subsurface areas, and to - keep records of surveys of subsurface residual radioactivity identified at the site with records important for decommissioning. The amended financial assurance regulations in Parts 30, 40, 50, 70, and 72 require materials licensees to report additional details in their decommissioning cost estimates, and require decommissioning power reactor licensees to annually report additional information on the costs of decommissioning and spent fuel management. This rule

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eliminates the line of credit as an approved financial assurance mechanism for all licensees, and eliminates the escrow account as an approved financial assurance mechanism for materials licensees. Power reactor licensees may continue to use the escrow account because the technical basis for the rule did not include elimination of the escrow account as an approved financial assurance mechanism in 10 CFR 50.75. This rule adds requirements to the parent guarantee and self-guarantee provisions in Part 30 appendices to provide added assurance that funds will be available at the time of decommissioning, even if the guarantor enters bankruptcy.

BACKGROUND:

In a Staff Requirements Memorandum dated December 10, 2007, the Commission approved with comments, publication of the decommissioning planning proposed rule (SECY-07-0177).

The proposed rule was published on January 22, 2008 (73 FR 3812), for a 75-day public comment period. The Nuclear Energy Institute (NEI) and several other stakeholders requested an extension of 90 days to review issues raised in the proposed rule. The Commission extended the comment period for an additional 30 days on March 20, 2008 (73 FR 14946). The NRC received 35 comment letters on the proposed rule from States, licensees, industry organizations, environmental advocacy organizations, and one individual.

DISCUSSION:

This rule will reduce the likelihood that any currently operating facility will become a legacy site. A legacy site is a facility that is decommissioning with an owner who cannot complete the decommissioning work for technical or financial reasons. All of the legacy sites to date have been materials facilities. At the end of 2007, there were 6 legacy sites among the complex materials sites undergoing decommissioning. A primary cause of legacy sites has been licensees' lack of knowledge of subsurface contamination at the site, due to chronic releases in the soil and ground water that occur while the facility is operating. Licensees who are not fully aware of the extent of subsurface contamination at their site have been unprepared to complete decommissioning and, in some cases, have had insufficient funds to complete decommissioning.

The final rule includes: (1) amendments to 10 CFR Part 20 to minimize the introduction of contamination and to survey site areas containing contamination, with a focus on identifying significant amounts of residual radioactivity that would later prevent release of the site for unrestricted use; (2) changes to financial assurance requirements in Parts 30, 40, 70, and 72; and (3) new Part 50 reporting requirements for licensees with a decommissioning power reactor.

As indicated above, the new § 20.1406(c) and amended § 20.1501, address the problem of chronic releases. Both § 20.1406(c) and § 20.1501 contain the term "residual radioactivity." This term, defined in existing 10 CFR 20.1003, includes radioactivity in soils and ground water from licensed and unlicensed sources. The final rule's preamble, and draft Regulatory Guide DG-4014 that will be released for public comment to support the final rule, specify that the intent of the rule is to address onsite residual radioactivity that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402. The final rule changes to Part 20 are consistent with: (1) Commission policy in the License Termination Rule (62 FR 39082; July 21, 1997) stating that existing licensees are required by 10 CFR Part 20 to

have programs aimed at reducing exposure and minimizing waste, and (2) Commission policy in the final rule for Decommissioning Recordkeeping and License Termination: Documentation Additions (58 FR 39630; July 26, 1993) stating that the NRC regards remaining contamination (after cleanup activities or when contamination may have spread to inaccessible areas) as anything above the NRC's most current residual radioactivity criteria for allowing release of the site for unrestricted use. The final rule changes to Part 20 are risk-informed by stakeholder input, staff assessments, risk assessments and regulatory guides as documented in the technical basis for the rule. The technical basis for the rule was discussed with the Advisory Committee on Nuclear Waste and Materials on numerous occasions. Section 2 of the Regulatory Analysis (Enclosure 2) documents the technical basis for the final rule.

The changes to financial assurance requirements in 10 CFR Parts 30, 40, 70, and 72 provide additional assurance that: (1) licensees have accurate information during operations on which to base their future decommissioning work scope, and have provided the NRC a decommissioning cost estimate consistent with the work scope at regular intervals and (2) the licensee's decommissioning financial assurance will be available when needed, even if the licensee or its guarantor enter bankruptcy. The amendments require more detailed reporting by materials licensees in their decommissioning funding plan, with a requirement to update the plan at license renewal or at an interval not to exceed 3 years. The surveys required in § 20.1501 of significant subsurface contamination at the site are to be used in preparing the cost basis of the decommissioning cost estimate. To better ensure that funds are available when needed, the rulemaking eliminates use of the line of credit for all NRC licensees and the escrow account by materials licensees. Both of these financial instruments are more appropriate for short-term transactions, not the longer time frames that may be required for decommissioning financial assurance. Amendments in 10 CFR Part 30 Appendices A, C, D, and E, for the parent guarantee and self-guarantee financial assurance mechanisms assure that funds will be available from the guarantor at time of decommissioning.

The changes to 10 CFR Part 50 reporting requirements are directed at licensees who have a power reactor in a decommissioning status. Under new § 50.82(a)(8)(v), the licensee must file an annual report detailing the amount of funds spent on decommissioning, the amount required to complete decommissioning, and the remaining balance of decommissioning funds. This report is due annually until the licensee has completed its final radiation survey at the site. Power reactor licensees are allowed to use a 2 percent real rate of return on invested funds in their determination of adequate decommissioning funding. If the balance of funds, plus earnings, in conjunction with the other financial assurance methods do not cover the amount needed, then the licensee must provide in a status report, under new § 50.82(a)(8)(vi), additional financial assurance to cover the estimated cost to complete decommissioning. Under new § 50.82(a)(8)(vii), the licensee must file an annual report detailing its projected costs and funding for spent fuel management until title to the fuel and possession of the fuel is transferred to the Secretary of Energy. The content of financial status reports required under new § 50.82(a)(8)(v) and § 50.82(a)(8)(vii) differs from the content of other decommissioning financial assurance reports required of power reactor licensees.

The staff has recommended the effective date of the final rule to be 1 year following publication of the final rule in the *Federal Register*. The proposed rule stated that NRC was considering an effective date of 60 days following publication of the rule in the *Federal Register*. Several commenters on the proposed rule argued that more time was needed, and one suggested 1 year. The staff agrees that a 1 year period is appropriate to allow licensees to become

familiar with the new requirements, the guidance documents, and to make changes in their financial assurance instruments, if necessary (e.g., switch out of an escrow account).
The staff has committed to release two guidance documents to support the rule. Comments were received on both guidance documents during the proposed rule public comment period. The revised guidance for changes to financial assurance regulations is complete, in Revision 1 to Volume 3 of NUREG-1757, "Consolidated NMSS Decommissioning Guidance," and will be released with the publication of the final rule in the *Federal Register*. The guidance for changes to operations under amendments to 10 CFR Part 20 is in draft form, in Regulatory Guide DG-4014, "Radiological Surveys and Monitoring During Operations." The staff's plan is to release DG-4014 for public comment in March 2009 and to hold a related workshop with stakeholders. DG-4014 is planned to be in final form in November 2009. If the Commission approves publication of the final rule and a 1 year implementation period, licensees will have about 2 months to use the Regulatory Guide to prepare for compliance with the changes to Part 20 implemented in this final rule.

Backfit Considerations

The NEI, supported by several power reactor licensees, submitted comments on the proposed rule stating in part that the changes to § 20.1406(c) and § 20.1501(a) should have been subject to a full backfit analysis pursuant to § 50.109. Their position is that the proposed rule and draft guidance for surveys and monitoring will have substantial impacts on licensees' facilities and procedures. NEI further stated that the new § 20.1406(c) and § 20.1501(a) are not a clarification of existing requirements, but rather an effort to impose an expansive regulatory scheme of "ongoing decommissioning" where activities that would normally take place during decommissioning would have to occur during active facility operations. The backfit comments and NRC responses are in Section III.F of the proposed *Federal Register* notice for the final rule (Enclosure 1). Section XII of Enclosure 1 provides a summary of the NRC's position on the backfit issues, which are more fully addressed in Section 7 of the Regulatory Analysis (Enclosure 2). Section 6 of Enclosure 2 assesses the cost to power reactor licensees of their voluntary activities conducted under the NEI Groundwater Protection Initiative.

On June 20, 2008, the NEI submitted a request to present to the Committee to Review Generic Requirements (CRGR) industry comments on the decommissioning planning rulemaking. According to its charter, CRGR is an internal organization advising the NRC program offices and the Executive Director for Operations. As such, the CRGR may not arbitrate between the industry and staff on rulemakings. The CRGR provided the aforementioned information to NEI, and provided industry comments to the staff that are addressed in the enclosed final rulemaking package.

Furthermore, the Commission stated in SRM-SECY-07-0134, "Staff Requirements – SECY-07-0134 – Evaluation of the Overall Effectiveness of the Rulemaking Process Improvement Implementation Plan," October 2007, that the CRGR is removed from routine reviews of the rulemaking process and only receives a draft final rule for information purposes. On July 24, 2008, the staff provided an information copy of the draft final rule package to the CRGR.

The staff has also worked closely with the Advisory Committee on Nuclear Waste and Materials (ACNW) on the development of this rulemaking. The staff has provided both the ACNW and the Advisory Committee on Reactor Safeguards (ACRS) information copy of the July 11, 2007, draft proposed rule package, and the July 24, 2008, draft final rule package. In a February 28, 2008,

letter to Chairman Klein, the ACNW stated that they had closely examined specific decommissioning topics including the draft proposed rule on prevention of legacy sites (later renamed as decommissioning planning rulemaking).

The Office of the General Counsel (OGC) finds that the backfitting rules in 10 CFR 50.109, 70.76, and 72.62 do not require the preparation of a backfit analysis for this rulemaking. The NRC staff disagrees with comments submitted on the proposed rule that the new 20.1406(c) and amended 20.1501(a) will have substantial impacts on facilities and procedures. Actions undertaken by licensees during facility operations to comply with these new and amended requirements are expected to establish a technical basis for licensees and the NRC to understand the effects of significant residual radioactivity on decommissioning costs, and will help to determine whether existing financial assurance provided for site specific decommissioning is adequate.

Whether significant residual radioactivity exists at a given site is a complex, site-specific issue, and the NRC received no information during the proposed rule public comment period that any currently operating facility has significant levels of residual radioactivity onsite. As indicated above, for operating facilities, the NRC staff considers significant residual radioactivity to be a quantity of radioactive material that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402. NRC will expect licensees to apply radiological screening values, or other methods recommended in draft Regulatory Guide DG-4014, to determine if residual radioactivity at the site has accumulated or is in ground water at levels that are considered significant.

Contrary to comments submitted on the proposed rule, this rulemaking imposes no new requirement for licensees to perform "ongoing decommissioning." Licensees are not being required to perform any new type of extensive characterization or remediation during facility operations. Instead, in DG-4014, the NRC has specified for licensees (1) an acceptable method to determine if any changes are needed to existing site monitoring practices and (2) acceptable approaches to determine the cost-effectiveness of prompt compared to deferred cleanup of contamination based on sample analysis. Remediation of residual radioactivity at the site may occur during decommissioning, or it may occur during facility operations if the licensee deems it beneficial to perform sooner rather than later.

Applicability of the Rule to Uranium Recovery (UR) Facilities

Several UR licensees commented on the proposed rule, arguing in part that they should be exempt from the new 10 CFR 20.1406(c) and amended 20.1501(a) requirements. The staff agrees that UR licensees are exempt from new 10 CFR 20.1406(c) because existing 10 CFR 20.1401 provides UR licensees with an exemption from Part 20 Subpart E requirements. The staff disagrees that UR licensees should be exempt from 10 CFR 20.1501(a) requirements because these Subpart F requirements have been applicable to UR licensees from the time that these requirements were established in 1991, and no persuasive reasons were identified to extend the scope of the existing 10 CFR 20.1401 exclusion. These issues are discussed in further detail in Section III of Enclosure 1.

Rule Applicability to Other Classes of Licensees

Commenters argued that certain NRC licensees, other than those with UR facilities, should be exempt from the 10 CFR 20.1406(c) and 20.1501 rule changes because dispersal of radioactive material is not possible from these facilities in quantities that would require remediation to comply with 10 CFR 20.1402 release criteria at time of decommissioning. This position was expressed on behalf of radionuclide and radiopharmaceutical manufacturing licensees, research and test reactor licensees, and licensed sewage water treatment facilities. The NRC staff agrees that if a facility has no credible release scenario that could contribute to significant subsurface residual radioactivity at the site, then it is likely that the facility will not be affected by the final rule changes to 10 CFR Part 20. However, without effective regulation, the technical and financial conditions that contributed to the creation of legacy sites in the past could occur at sites that are licensed under 10 CFR Parts 30, 40, 50, 70, or 72, especially those with radioactive material possession limits high enough to require decommissioning financial assurance. As documented in Enclosure 2, no exemptions were included in the rule language because of the relatively high cost of remediating a legacy site compared to the cost to implement the final rule. Draft Regulatory Guide DG-4014 describes an acceptable method for licensees with no credible release scenario to evaluate residual radioactivity at their facility.

Changes to the Parent Guarantee and the Self-Guarantee

Current 10 CFR Part 30 Appendix A allows the use of a parent company guarantee, and Appendices C, D, and E allow the use of a company self-guarantee, as financial assurance for decommissioning. About 45 NRC licensees use a guarantee for decommissioning financial assurance, with a total guaranteed amount of about $600 million. About 150 Agreement State licensees use a guarantee for decommissioning financial assurance, for a total of about $200 million. This rule has added new language in 10 CFR Part 30 Appendix A, Section III.E, requiring parent guarantors to be jointly and severally liable for the full cost of decommissioning. Several comments were received opposing this in the proposed rule, and these comments are addressed in Section III of Enclosure 1 (response to Comment H.10). In the proposed rule and the final rule language, the NRC staff has defined the potential responsibility of a parent corporation or limited liability company for the decommissioning obligations of its subsidiary, irrespective of the limited corporate liability or limited liability of the parent company. This obligation is for the full cost of decommissioning. This new rule text provides added assurance that adequate funds will be available at time of decommissioning and it applies equally to the guarantors of facilities licensed under 10 CFR Parts 30, 40, 50, 70, and 72.

A parent company is typically not an NRC licensee subject to the NRC's authority. This final rule added language in 10 CFR Part 30 Appendix A, Section III.F, requiring the parent company to agree that it would be subject to a Commission order to make payment under the guarantee agreement, in the event that the parent company was in financial distress. One commenter (Section III in Enclosure 1, Comment H.9) noted that this would essentially require a consent order to be entered into by a parent company. The NRC staff agrees with this comment, adding that the parent company agreeing to be subject to Commission orders would also, in effect, be acknowledging that it is engaged in NRC subject matter jurisdiction with no waiver of hearing rights. These amendments to the parent guarantee provide added assurance that funds will be available at time of decommissioning even if the guarantor goes into bankruptcy.

Rule Language in 10 CFR Part 50.75(f)(1) and § 50.75(f)(2)

The proposed rule included a change in § 50.75(e)(1)(iii)(A) to eliminate the line of credit as an approved financial assurance mechanism. After the close of the proposed rule public comment period, the Office of Nuclear Reactor Regulation (NRR) requested three minor changes to the final rule text in § 50.75(f)(1) and § 50.75(f)(2), which are identical regulatory text except that one sentence in § 50.75(f)(1) allows holders of a combined operating license to delay their reports. OGC determined that the changes requested by NRR impose no additional requirements, and are not substantive modifications. These have been added to the final rule text. Further details are provided in Section IV of Enclosure 1.

Rule Language in 10 CFR Part 72

In response to comments on the proposed rule, several changes were made to 10 CFR Part 72 in this final rule. Regarding 10 CFR 72.13(c), which lists the Part 72 sections that are applicable to Part 72 general licensees, the January 22, 2008, proposed rule's discussion of 10 CFR 72.13(c) did not reflect all of the proposed revisions to 10 CFR § 72.30. However, such revisions were fully reflected in the January 22, 2008 *Federal Register* notice's discussion of 10 CFR 72.30, and Part 72 general licensees are already subject to decommissioning funding plan (DFP) requirements pursuant to existing § 72.30(d)(4). OGC has determined that Part 72 general licensees were thus fairly on notice that they were subject to revisions in decommissioning funding plan (DFP) requirements. Further details regarding this issue, and the changes being made to 10 CFR Part 72 in this final rule, are discussed in Enclosure 1, Section III, comments H.25 and H.27, and Section IV.

OUTCOME OF THIS FINAL RULE: ADVANCING NRC'S STRATEGIC GOALS:

The final rule is consistent with NRC's strategic goals and objectives. The rule will reduce the likelihood of additional legacy sites and thereby continue the safety goal efforts to ensure protection of the public health and safety. The rule also will enhance environmental protection by improving licensees' decommissioning planning activities during active facility operations, when revenue to pay for decommissioning costs will more likely be available, if needed. NRC environmental protection oversight will be improved by increased recordkeeping of site contamination which serves as the basis for licensees' decommissioning cost estimates. The rule will help to ensure that NRC actions are effective, efficient, realistic, and timely. The rule will improve regulatory efficiency by codifying provisions that have been in regulatory guidance.

AGREEMENT STATE ISSUES:

The draft final rule was provided to the Agreement States on July 30, 2008 (RCPD-08-015). The State of South Carolina concurred with the draft final rule. The State of Colorado initially objected to portions of the draft final rule, but later withdrew its objection. The State of Colorado also agreed with comments submitted by the State of New York on the proposed rule that would require that licensees' records important for decommissioning, maintained by licensees and available for inspection by NRC, but which are not made public, should instead be reported to the NRC and made available to the public. The NRC disagrees with this position and has addressed this in Enclosure 1, Section III, in the response to comments G.23 and G.27.

Agreement States will need to issue legally binding requirements for their licensees, which can be accomplished through promulgating a rule, issuing orders, or adding or revising individual

license conditions. The Agreement States will be responsible for inspection and enforcement of their licensees' compliance with the requirements.

The staff analyzed the final rule in accordance with the procedures established within Part III of the Handbook to Management Directive 5.9, "Categorization Process for NRC Program Elements." Staff has determined that sections of the final rule are classified in Compatibility Categories "NRC", "H&S", "C", and "D." Section VI of the final rule addresses the topic of Agreement State Compatibility and has a compatibility table for each new or revised section of regulatory text.

COMMITMENT:

The staff commits to develop regulatory guidance to: (1) implement subsurface survey requirements through draft Regulatory Guide DG-4014, for public comment, followed by a final Regulatory Guide to implement the monitoring requirements and (2) implement financial assurance requirements through Revision 1 to NUREG-1757, Volume 3. Both documents are planned to be finalized several months before the effective date of the final rule.

RECOMMENDATIONS:

That the Commission:

1. Approve for publication, in the *Federal Register*, the attached notice of final rulemaking (Enclosure 1).
2. To satisfy the requirement of the Regulatory Flexibility Act, 5 U.S.C. 605 (b), certify that this rule, if promulgated, will not have significant impact on a substantial number of small entities. This certification is included in the attached *Federal Register* notice.

3. Note:

    a. That the Chief Counsel for Advocacy of the Small Business Administration will be informed of the certification and the reasons for it, as required by the Regulatory Flexibility Act, 5 U.S.C. 605(b);

    b. A final Regulatory Analysis has been prepared for this rulemaking (Enclosure 2);

    c. A final Environmental Assessment has been prepared for this rulemaking (Enclosure 3);

    d. The staff has determined that this action is not a "major rule," as defined in the Congressional Review Act of 1996 [5 U.S.C 804(2)] and has confirmed this determination with the OMB . The appropriate Congressional and Government Accountability Office contacts will be informed;

    e. The appropriate Congressional committees will be informed;

    f. A press release will be issued by the Office of Public Affairs when the final rulemaking is filed with the Office of the Federal Register; and

g. The final rule contains amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, et seq.) that must be submitted to the OMB for its review and approval before publication of the final rule in the *Federal Register*.

RESOURCES:

To complete the rulemaking, less than 0.1 full-time equivalent position will be required. These resources are included in the current budget for FY09. To complete draft Regulatory Guide DG-4014, a total of 0.1 FTE has been budgeted in FY09 by FSME/DWMEP.

COORDINATION:

The Office of the General Counsel has no legal objection to the final rulemaking. The Office of the Chief Financial Officer has reviewed this Commission Paper for resource implications and has no objections.

/RA Martin Virgilio for/

R. W. Borchardt
Executive Director
for Operations

Enclosures:
1. Final Rule: *Federal Register* notice
2. Regulatory Analysis
3. Environmental Assessment

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NUCLEAR REGULATORY COMMISSION

10 CFR Parts 20, 30, 40, 50, 70, and 72

RIN: 3150-AH45

[NRC-2008-0030]

Decommissioning Planning

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is amending its regulations to improve decommissioning planning, and thereby reduce the likelihood that any current operating facility will become a legacy site. The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, including subsurface soil and ground water. Licensees also are required to perform surveys to determine if certain quantities or concentrations of residual radioactivity exist, including in subsurface areas, and keep records of surveys of subsurface residual radioactivity identified at the site with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate (DCE), eliminate the escrow account and line of credit as approved financial assurance mechanisms, and modify the parent company guarantee and self-guarantee financial assurance mechanisms to authorize the NRC to require that guaranteed funds be immediately due and payable to a standby trust if the guarantor is in financial distress. Finally, the amended regulations require decommissioning

power reactor licensees to report additional information on the costs of decommissioning and spent fuel management.

DATES: *Effective Date:* This final rule is effective on **[INSERT DATE 365 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].** Compliance with the reporting provisions in 10 CFR 50.82(a)(8)(v) and (vii) is required by March 31, 2010.

ADDRESSES: You can access publicly available documents related to this document using the following methods:

Federal e-Rulemaking Portal: Go to http://www.regulations.gov and search for documents filed under Docket ID [NRC-2008-0030]. Address questions about NRC dockets to Carol Gallagher at 301-415-5905; e-mail Carol.Gallagher@nrc.gov.

NRC's Public Document Room (PDR): The public may examine and have copied for a fee publicly available documents at the NRC's PDR, Public File Area O F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland.

NRC's Agencywide Documents Access and Management System (ADAMS): Publicly available documents created or received at the NRC are available electronically at the NRC's electronic Reading Room at http://www.nrc.gov/reading-rm/adams.html. From this page, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's PDR reference staff at 1-899-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

FOR FURTHER INFORMATION CONTACT: Kevin O'Sullivan, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone 301-415-8112, e-mail Kevin.OSullivan@nrc.gov.

SUPPLEMENTARY INFORMATION:

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I. Background

The NRC issued comprehensive and risk informed decommissioning regulations in 1997 as Subpart E of 10 CFR Part 20 (62 FR 39058; July 21, 1997). This set of requirements is known as the License Termination Rule (LTR). The LTR is based on calculated doses, and it established specific radiological criteria for remediation of lands and structures to complete site decommissioning and successfully terminate the license. The LTR provides an overall approach for license termination for two different site conditions: unrestricted use and restricted conditions for use after license termination. The LTR applies to the decommissioning of facilities licensed under 10 CFR Parts 30, 40, 50, 60, 61, 63, 70 and 72. In the 1997 LTR final rule, in response to a public comment that the requirements of then-proposed 10 CFR 20.1406 should apply to all licensees, rather than only to applicants for new licenses, the Commission stated:

> "Applicants and existing licensees, including those making license renewals, are already required by 10 CFR Part 20 to have radiation protection programs aimed towards reducing exposure and minimizing waste. In particular, Sec. 20.1101(a) requires development and implementation of a radiation protection plan commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of 10 CFR Part 20. Section 20.1101(b) requires licensees to use, to the extent practicable, procedures and engineered controls to achieve public doses that are [as low as reasonably achievable] ALARA. In addition, lessons learned and documented in reports such as NUREG-1444 have focused attention on the need to minimize and control waste generation during operations as part of development of the required radiation protection plans. Furthermore, the financial assurance requirements issued in the January 27, 1988 (53 FR 24018), rule on planning for decommissioning require licensees to provide adequate funding for decommissioning. These funding requirements create great incentive to minimize contamination and the amount of funds set aside and expended on cleanup." (62 FR 39082; July 21, 1997).

Current 10 CFR 20.1101(a) requires each licensee to implement a radiation protection program to ensure compliance with the regulations in 10 CFR Part 20. Current § 20.1101(b) requires each licensee to use, to the extent practical, procedures and engineering controls

based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA. Licensees need to apply operating procedures and controls to evaluate potential radiological hazards and methods to minimize and control waste generation during facility operations, to achieve doses that are ALARA.

In a Staff Requirements Memorandum (SRM) for SECY-01-0194, dated June 18, 2002, the Commission directed the staff to conduct an analysis of LTR issues. The staff conducted the analysis and presented results and recommendations to the Commission in SECY-03-0069 (http://www.nrc.gov/reading-rm/doc-collections/commission/srm/2003/2003-0069srm.pdf), (dated May 2, 2003, and known as the LTR Analysis). One of the recommendations was a set of "measures to prevent future legacy sites." A legacy site is a facility that is in decommissioning status with complex issues and an owner who cannot complete the decommissioning work for technical or financial reasons (as discussed further in Section II.E of this rule). The set of measures to prevent future legacy sites had two distinct parts: (1) The need for timely reporting during facility operations of subsurface contamination that has a potential to complicate future decommissioning efforts and (2) The need for more detailed reporting of licensee financial assurance mechanisms to fund site decommissioning activities and protection of the committed funds in cases of financial distress. The need for timely reporting of subsurface contamination during facility operations was explained in Attachment 8 to SECY-03-0069. Attachment 8, under the heading "chronic releases," recommended revising 10 CFR 20.1406 to extend its minimization of contamination requirements to cover licensees in addition to license applicants. Recommendations for more detailed decommissioning financial assurance requirements are set forth in Attachment 7 to SECY-03-0069.

In SRM-SECY-03-0069 the Commission approved the staff's recommendations and authorized development of a technical basis to support a proposed rule. As pertinent to the

then-proposed 10 CFR 20.1406 and 10 CFR 20.1501 revisions, the Commission's SRM states as follows:

> "The Commission has approved the staff's recommendation related to changes in licensee operations as described in attachment 8. However, in addition to incorporating risk-informed approaches, the staff should ensure that they are performance-based. The staff will have to be very careful when crafting the guidance documents so that it is clear to the licensees and to the staff how much characterization information is enough. The staff should only ask for limited information. Licensees should not be required to submit the equivalent of a full scale MARSSIM [Multi-Agency Radiation Survey and Site Investigation Manual] survey every year."

During 2003 and 2004, the NRC staff evaluated the decommissioning program and assessed the effectiveness of other improvements to protect public health and safety beyond those identified in the LTR Analysis. To integrate and track regulatory improvements resulting from the LTR Analysis and the Decommissioning Program Evaluation, the NRC adopted an Integrated Decommissioning Improvement Plan (IDIP) for activities during FY 2004 through 2007. Among other actions, the IDIP called for publication of the Decommissioning Planning proposed rule and written guidance describing changes in the regulations to prevent future legacy sites.

In 2005 and 2006, the operators of several nuclear power plants reported that inadvertent and unmonitored radioactive liquid releases, primarily tritium contained in water, had occurred. In some instances, the release of radioactive liquid was not recognized by the licensee until years after the release apparently started. The NRC Executive Director for Operations chartered a Task Force to conduct a lessons-learned review of these incidents. The Task Force final report dated September 1, 2006, concluded that the levels of tritium and other radionuclides measured thus far do not present a health hazard to the public, and presented a list of findings and recommendations that the Task Force believed would improve plant operations and public confidence in nuclear plant operations. The findings and recommendations in the Task Force report identified the need to clarify existing licensee

requirements to demonstrate that they have achieved public and occupational exposures that are ALARA during the life cycle of the facility which includes the decommissioning phase.

In April 2005, the NRC conducted a two-day public workshop to solicit public comments on the technical basis for the proposed rule, covering changes in licensee operations and financial assurance. A one-day public roundtable meeting was held in January 2007 to solicit public comments on specific topics in the technical basis for the proposed rule.

SECY-07-0177, dated October 3, 2007, requested Commission approval to publish a proposed rule consistent with the recommendations approved in SRM-SECY-03-0069 and the public comments from the workshop and roundtable meeting noted previously. The Commission approved staff's request in SRM-SECY-07-0177, dated December 10, 2007, with comments. One comment directed the staff to aggressively encourage public comments on the proposed rule so that the decision on the final rule appropriately considers all relevant issues and identifies and resolves unintended consequences if they exist. The staff informed by e-mail about 40 stakeholders of the proposed rule, published in the *Federal Register* on January 22, 2008, and explained in the e-mail the process to submit public comments. These 40 stakeholders had provided their e-mail address to the NRC staff in their registration to attend a public roundtable meeting in January 2007 to discuss the technical basis of the proposed rule.

II. Discussion

A. What Action is the NRC Taking?

The NRC is amending its regulations to improve decommissioning planning, and thereby reduce the likelihood that facilities under its jurisdiction will become legacy sites. To help achieve this goal, one set of complementary amendments revise 10 CFR 20.1406 to make it applicable to licensees with operating facilities as well as to license applicants, and revise

10 CFR 20.1501(a) by replacing its undefined term "radioactive material" with "residual radioactivity," a term already defined in 10 CFR Part 20. This defined term includes subsurface contamination within its scope. Both new 10 CFR 20.1406(c) and amended 20.1501(a) are worded to include subsurface contamination within their scope by using the term "residual radioactivity." These changes serve to reinforce the intended linkage between these provisions, and are consistent with NRC policy that licensees conduct operations to minimize the generation of waste to facilitate later facility decommissioning. A second set of amendments improve decommissioning planning by requiring more detailed reporting of DCEs and tighter control of financial instruments used to provide decommissioning financial assurance.

The new 10 CFR 20.1406(c) states as follows:

> (c) Licensees shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the existing radiation protection requirements in Subpart B of this part and radiological criteria for license termination in Subpart E of this part.

The amended 10 CFR 20.1501(a) and (b) state as follows:

> (a) Each licensee shall make or cause to be made, surveys of areas, including the subsurface, that --
> (1) May be necessary for the licensee to comply with the regulations in this part; and
> (2) Are reasonable under the circumstances to evaluate --
> (i) The magnitude and extent of radiation levels; and
> (ii) Concentrations or quantities of residual radioactivity; and
> (iii) The potential radiological hazards of the radiation levels and residual radioactivity detected.
> (b) Records from surveys describing the location and amount of subsurface residual radioactivity identified at the site must be kept with records important for decommissioning.

As indicated, use of the term "residual radioactivity" is a key component of the amendments, and this term is discussed below. It is also discussed in the response to comment F.24 in section III of this rule.

1. Residual Radioactivity.

As set forth in 10 CFR 20.1003:

> "*Residual radioactivity* means radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee's control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of 10 CFR Part 20."

Certain operational events (e.g., slow, long-term leaks), particularly those that cause subsurface soil and ground-water contamination, can significantly increase the cost of decommissioning. To adequately assure that a decommissioning fund will cover the costs of decommissioning, the owner of a facility must have a reasonably accurate estimate of the extent to which residual radioactivity is present at the facility, particularly in the subsurface soil and ground water. As reflected previously, the new 10 CFR 20.1406(c) requires that licensees conduct their operations in a manner that will minimize the introduction of residual radioactivity into the site.

Section 20.1501(a) has been revised by replacing its undefined term "radioactive material" with "residual radioactivity." To some people, the phrase "residual radioactivity" may have a connotation implying radioactive material that is "left over" after operations. This is not the meaning. As reflected in its definition stated previously, this term includes everything that the term "radioactive material" implies in this section of the regulations before this final rule as well as other radioactive material resulting from activities under the licensee's control, such as contamination in the subsurface. The use of the term "residual radioactivity" in § 20.1501(a) also is intended to provide a link with new § 20.1406(c). The amended § 20.1501(a) retains previous survey requirements, with the addition that such requirements include consideration of waste in the form of residual radioactivity. Together, the amended § 20.1501(a) and new § 20.1406(c) specify that compliance with 10 CFR Part 20 requirements is a necessary part of effectively planning for decommissioning. The new § 20.1406(c) and § 20.1501(a) provisions

are discussed further in Sections II.I and J of this rule. These activities, undertaken during facility operations, will provide a technical basis for licensees and NRC to understand the effects of significant residual radioactivity on decommissioning costs, and will help to determine whether existing financial assurance provided for site-specific decommissioning is adequate. By using the term "residual radioactivity," the new § 20.1406(c) and amended § 20.1501(a) cover any licensed and unlicensed radioactive material that have been introduced to the site by licensee activities.

New paragraph 10 CFR 20.1501(b) requires licensees to keep records of surveys of subsurface residual radioactivity identified at the site with records important for decommissioning.

During operations, residual radioactivity that would be significant for decommissioning planning would be a quantity of radioactive material that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402. As stated in the proposed rule, significant residual radioactivity in subsurface media, such as soil, is a component of waste because it must be removed and disposed of to meet unrestricted use criteria in 10 CFR 20.1402 [73 FR 3815 c. 1].

During decommissioning, the licensee must evaluate dose from all residual radioactivity surveyed at its site using the radiological criteria in Subpart E to 10 CFR Part 20. For contamination migrating offsite from previous leaks and spills into the subsurface, a licensee must comply with the applicable license conditions for its facility. Such offsite contamination, released as an effluent in quantities below annual regulatory limits, has been a factor in the decommissioning of a few NRC and Agreement State sites. However, the scope of this rulemaking does not include offsite contamination discovered during decommissioning.

NRC’s technical basis for the effect that significant residual radioactivity in the subsurface has on decommissioning costs is based on a 2005 NRC staff study, "General

Guidance for Inspections and Enforcement to Prevent Future Legacy Sites and Indicators of Higher Risk of Subsurface Contamination" [NRC ADAMS Accession Number ML052630421]. The purpose of this study was to evaluate experience at sites that have undergone, or were undergoing decommissioning to identify the types of events that have caused subsurface contamination. Associating these events with knowledge of currently operating sites provided a means for NRC staff to evaluate the potential for future subsurface contamination at currently operating facilities. This risk-informed approach concluded that the sites with a higher likelihood of becoming legacy sites shared the following characteristics: relatively large volumes of low specific activity radioactively contaminated liquids; large volumes of long-lived radionuclides; large throughput; liquid processes; or processes that involve large quantities of solid radioactive material stored outdoors. The study identified a number of events that could increase decommissioning costs by increasing the possibility of soil or ground-water contamination, and concluded that these events should cause the licensee to reevaluate its DCE. Additional discussion on this topic is in Sections II.G and II.H of this rule.

The changes to 10 CFR 20.1406 and 20.1501 are consistent with existing NRC policy for operating facilities. Under 10 CFR 20.1101(b), licensees must use procedures and engineering controls to achieve occupational doses and doses to members of the public that are ALARA, during operations and during decommissioning. To accomplish this, licensees must be able to demonstrate their knowledge of residual radioactivity in the subsurface, including soil and ground-water contamination, particularly if the subsurface contamination is a significant amount that would require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402. This is an extension of the requirements promulgated, with widespread agreement, in the 1997 LTR that were applicable only to license applicants. This action is needed because subsurface residual radioactivity at current operating facilities may be a potential radiological hazard, and a risk to fully fund decommissioning while the facility is in an

operating mode. The linkage between new 10 CFR 20.1406(c) and amended 10 CFR 20.1501(a) better institutes existing NRC policy with respect to subsurface contamination during facility operations, to achieve doses that are ALARA, and identifies to licensees that survey requirements may be a necessary part of effectively planning for decommissioning as well as to comply with dose limits.

2. Financial Assurance.

This final rule (amending § 30.35, § 40.36, § 70.25, and § 72.30, and Criterion 9 of appendix A to Part 40) codifies certain aspects of existing regulatory guidance to improve the quality of DFP, and applies NRC experience to increase the likelihood that adequate funds will be available when needed to complete the decommissioning process. This final rule allows materials licensees to base their financial assurance for decommissioning on a "certification amount" only if the licensee's site surveys do not indicate the presence of residual radioactivity in amounts that would prevent the site from meeting the unrestricted use criteria in § 20.1402. This final rule addresses the potential vulnerability of the parent company guarantee and the self-guarantee as the financial mechanism for decommissioning funding assurance during financial distress of the guarantor. This final rule requires each licensee who uses the guarantee mechanism to establish a standby trust fund to receive the guaranteed financial assurance amount should that amount become immediately due and payable.

For licensees with reactors in a decommissioning status, this final rule institutes additional reporting requirements for decommissioning fund status, spent fuel management costs, and estimated decommissioning costs. These new reporting requirements, in part, modify the existing Post Shutdown Decommissioning Activities Report requirements set forth in 10 CFR 50.82(a)(4)(i). Additional reporting requirements specify that each power reactor licensee undergoing decommissioning must submit an annual financial assurance status report, as set forth in new paragraphs 10 CFR 50.82(a)(8)(v) through (a)(8)(vii).

Under this final rule, all licensees decommissioning their facilities pursuant to 10 CFR 20.1403 restricted release criteria are required to use a trust fund to meet the financial assurance requirements. A trust fund is the only financial assurance mechanism allowed for the long term maintenance and surveillance of restricted release sites unless a government organization either provides a guarantee of funds or assumes custody and ownership of the site. This topic is discussed further in Section II.N of this final rule.

B. Who Does This Action Affect?

By the effective date of this final rule, the NRC believes changes to 10 CFR Part 20 will affect a small number of licensees, and changes to financial assurance regulations will affect several hundred NRC licensees.

Based on the regulatory analysis for the final rule, NRC believes a small number of materials licensees (a total of about 5 NRC and Agreement State licensees) will need to perform additional site surveys due to the presence of significant residual radioactivity. The licensees who will need to perform additional surveys were modeled in the regulatory analysis as rare metal (i.e., rare earth) extraction facilities with uranium as a soil contaminant. Although the number of licensees affected by rule changes to 10 CFR Part 20 is small, the cost to States or the Federal Government to enforce and then fully decommission a single legacy site is much higher than the cost to prevent the occurrence of a legacy site through amended regulations.

Uranium recovery licensees and applicants will not be subject to the new 10 CFR 20.1406(c) requirements, just as they are not subject to the existing 10 CFR 20.1406 requirements. As stated in existing 10 CFR 20.1401(a), uranium and thorium recovery facilities, and uranium solution extraction facilities, are not subject to the regulations in 10 CFR Part 20 Subpart E. Such facilities are and will continue to be subject to the regulations in the other 10 CFR Part 20 subparts, and the revised survey and monitoring requirements in 10 CFR

20.1501(a) and new 20.1501(b) will thus be applicable to them. Uranium recovery licensees are additionally subject to existing monitoring requirements pertaining to soil and ground water contamination in appendix A to 10 CFR Part 40. The above issues are discussed further below in response to comments on the proposed rule submitted by uranium recovery licensees.

For NRC licensees who have subsurface residual radioactivity with no ground water contamination, a minimal, routine monitoring plan may remain in effect through license termination. The routine monitoring plan is described in draft Regulatory Guide DG-4014, "Radiological Surveys and Monitoring During Operations," issued for public comment to support this final rule. Application of a minimal, routine monitoring plan at sites with no ground water implications is meant to improve licensee decommissioning planning and the basis used for DCEs.

The large majority of NRC and Agreement State licensees are not expected to have residual radioactivity because they possess small amounts of short-lived byproduct material or byproduct material that is encased in a capsule designed to prevent leakage or escape of the byproduct material (i.e., a sealed source). This set of licensees is expected to include the non-fuel-cycle nuclear facilities, which either have no significant residual radioactive contamination to be cleaned up, or, if there is contamination, it is localized or will be quickly reduced to low levels by radioactive decay. Licensees who do not have residual radioactivity and do not have an obligation to set aside funds for decommissioning financial assurance are not affected by this final rule.

Approximately 300 NRC materials licensees and over 1,000 Agreement State licensees have an obligation to set aside funds for decommissioning financial assurance. Of the NRC licensees, approximately 50 percent use a certified amount, specified in regulations, with the remaining 50 percent using a site-specific DFP or License Termination Plan to meet the decommissioning financial assurance requirements. If there is significant residual radioactivity

at the site, the final rule changes in § 30.35, § 40.36, § 70.25, and § 72.30 require a licensee to switch out of its certified funding amount, and replace the certified amount with a DFP. At this time, the NRC staff is not aware of any licensees using certified amounts for decommissioning that need to switch to a DFP because of significant residual radioactivity.

Licensees using a site-specific DFP or License Termination Plan to meet decommissioning financial assurance requirements will have additional reporting requirements based on final rule changes in § 30.35, § 40.36, § 50.82, § 70.25, and § 72.30. The materials licensees under 10 CFR Parts 30, 40, 70, and 72 will need to provide more details to support their DCE, such as the assumed cost of an independent contractor to perform all decommissioning activities. The power reactor licensees under 10 CFR Part 50 will need to provide more details to support their decommissioning schedule, cost estimates for managing irradiated fuel, and annual financial assurance status report.

Final rule changes to 10 CFR 50.82(a) affect the 12 power reactor licensees undergoing decommissioning. Such licensees will need to provide more details regarding their DCEs. Licensees will also need to provide cost estimates for managing irradiated fuel. More specifically, licensees who have submitted a certification of permanent cessation of operations under 10 CFR 50.82(a) are subject to annual financial assurance reporting requirements similar to those imposed on operating reactors under existing 10 CFR 50.75(f). The annual reports must identify yearly decommissioning expenditures, the remaining balance of decommissioning funds, and a cost estimate to complete decommissioning. Similar to the one-time reports required by 10 CFR 50.54(bb), the annual reports required under 10 CFR 50.82(a)(8) must identify the amount of funds accumulated to manage irradiated fuel, and the projected cost of managing the irradiated fuel until title and possession is transferred to the Secretary of Energy.

Approximately 20 NRC licensees use an escrow account as a prepayment financial mechanism and will be affected by final rule changes in § 30.35, § 40.36, § 70.25, and § 72.30

(which eliminate the escrow account as a prepayment financial assurance method). No NRC licensees are using a line of credit as a financial mechanism which also has been eliminated as an acceptable financial assurance instrument.

Approximately 45 NRC licensees use a parent company guarantee or self-guarantee as a financial assurance mechanism. These licensees will be affected by final rule changes in 10 CFR Part 30, appendices A, C, D, and E, which require establishment of a standby trust fund before the guarantee becomes effective and other new requirements. The standby trust fund is to be set up for receipt of funds in the case of financial distress by the guarantor. In the regulatory analysis and Paperwork Reduction Act burden estimate, NRC assumed that a total of 25 of these 45 licensees will need to establish a trust fund to comply with the amended regulations, while the other 20 already have an established trust fund.

The regulatory analysis for this final rule, referenced in Section X of this rule, has detailed cost-benefit estimates regarding the licensees who will be affected by amended regulations.

C. What Steps Did NRC Take to Prepare for this Rulemaking?

The NRC took several initiatives to enhance stakeholder involvement and to improve efficiency during the rulemaking process. On May 28, 2004, the NRC staff issued Regulatory Information Summary (RIS) 2004-08, "Results of the License Termination Rule Analysis." This RIS was the first follow-up action taken in response to SRM-SECY-03-0069. The purpose of the RIS was to inform licensees and stakeholders of NRC's analysis of the issues associated with implementing the LTR, the Commission's direction to resolve these issues, the schedule for future actions, and opportunities for stakeholder comment. The RIS noted that stakeholder involvement would be an important part of developing the planned rulemaking and guidance.

In April 2005, the NRC conducted a 2-day decommissioning workshop examining a number of LTR topics, including potential changes in facility operating requirements and

changes to financial assurance to prevent legacy sites. Stakeholders addressed the issues and potential resolutions that could be accomplished through rulemaking. Since then, NRC has maintained a web page (http://www.nrc.gov/about-nrc/regulatory/decommissioning.html) with information including draft guidance documents, Commission papers, and a variety of decommissioning program documents. NRC presented papers on the technical basis scope of the rulemaking at American Nuclear Society conferences in 2004, 2005, and 2006, and other stakeholder forums.

In June 2006, the NRC formed a proposed rule Working Group of NRC staff and one Agreement State representative from the Organization of Agreement States (OAS). The NRC has held discussions with State and Federal agencies on their experience with trust funds for long-term financial assurance, including a discussion with the U.S. Environmental Protection Agency (EPA) on October 6, 2006.

In January 2007, the NRC held a public roundtable meeting that was attended by about 40 stakeholders. The meeting was held to solicit input from stakeholders and interested members of the public regarding the issues of licensee control and identification of subsurface residual radioactivity, and changes that were being considered in decommissioning financial assurance requirements. The Summary Notes and transcript of this public meeting are posted on: http://www.nrc.gov/about-nrc/regulatory/decommissioning/public-involve.html.

D. What Alternatives Did NRC Consider?

The proposed rule Working Group considered three different alternatives for the rule. Each was evaluated in the environmental assessment (see Section VIII of this final rule) and the regulatory analysis (see Section X of this final rule). Alternative 2, comprised of the amendments in this final rule, was assessed to be superior compared to the other alternatives.

E. What is a Legacy Site?

A legacy site is a facility that is decommissioning and has an owner who cannot complete the decommissioning work for technical or financial reasons. These sites have been materials facilities, not reactor facilities.

The purpose of this final rule is to improve decommissioning planning and thereby reduce the likelihood that a site will become a legacy site, thus avoiding unnecessary expense and promoting more timely return of licensed sites to other productive uses.

NRC terminates several hundred materials licenses each year. Most of these are routine actions, and the sites require little, if any, remediation to meet NRC's unrestricted use criteria. There are other sites where more complex decommissioning actions are needed. These complex decommissioning sites are described, along with the objectives of NRC decommissioning activities, in the "Status of Decommissioning Program 2006 Annual Report" available at: http://www.nrc.gov/about-nrc/regulatory/decommissioning/program-docs.html. This report identifies and describes the status of 32 complex materials sites undergoing decommissioning. Of the total 32 complex sites, NRC considers 8 of these to be legacy sites as of December 31, 2006. At the end of 2007, there were 6 legacy sites among the complex materials sites undergoing decommissioning.

F. What are Financial Assurances?

Financial assurances are financial arrangements provided by a licensee, whereby funds for decommissioning will be available when needed. Each NRC licensee has a regulatory obligation to properly decommission its facility. However, only licensees whose decommissioning cost is likely to exceed a threshold amount must provide financial assurance. All nuclear power reactors and about 7 percent of NRC materials licensees must provide decommissioning financial assurance. This financial assurance may be funds set aside by the

licensee or a guarantee that funds will be available when needed. The guarantee may be provided by a qualified third party or upon passage of a financial test by the licensee. The third party may be the parent company of the licensee, which is the case for about 10 percent of the NRC materials licensees who are obligated to have decommissioning financial assurance.

Nuclear power reactors have financial assurance obligations that are different from materials licensees. The minimum amount of financial assurance for reactors is defined in 10 CFR 50.75, and the acceptable financial assurance mechanisms are defined in § 50.75(e)(1). An external sinking fund is used to provide financial assurance for about 90 percent of the reactors. The remaining 10 percent of reactors have assurance through prepaid funds and/or guarantees. No changes in these requirements are planned for power reactor licensees.

As of December 31, 2006, there were about 300 NRC materials licensees that have a regulatory obligation to provide approved financial assurance mechanisms. An acceptable financial assurance mechanism for unrestricted use decommissioning is any of the following four types of financial instruments:

- A prepayment of the applicable decommissioning costs;
- A guarantee to pay the decommissioning costs issued by a qualified third party or the licensee;
- A statement of intent from a Federal, state or local government licensee; or
- An external sinking fund.

The prepayment method is full payment in advance of decommissioning using an account segregated from licensee assets and outside the licensee's administrative control. About 11 percent of current financial assurance mechanisms for materials licensees are prepayment methods, with most of these being escrow accounts. Currently accepted prepayment mechanisms include escrow accounts (8 percent), trust funds (2 percent),

certificates of deposit (1 percent), government funds (0 percent), and deposits of government securities (0 percent). This final rule eliminates all prepayment mechanisms except the trust fund, for reasons discussed under Section II.N.2 of this rule.

The guarantee method can be used by licensees that demonstrate adequate financial strength through their annual completion of financial tests contained in appendices A, C, D, and E of 10 CFR Part 30. About 51 percent of current financial assurance mechanisms for materials licensees are guarantee methods. Currently accepted guarantee mechanisms include letters of credit (28 percent), parent company guarantees (8 percent), licensee self-guarantees (7 percent), surety bonds (8 percent), lines of credit (0 percent), and insurance policies (0 percent). This final rule eliminates the line of credit as an acceptable mechanism, for reasons discussed under Section II.N.10 of this rule.

The statement of intent is a commitment from a Federal, state or local government licensee that it will request and obtain decommissioning funds from its funding body, when necessary for decommissioning an NRC licensed site. It is available for use only by governmental entities. Approximately 38 percent of the NRC materials licensees with financial assurance use the statement of intent as a means to provide financial assurance.

The external sinking fund allows the licensee to gradually prepay the DCE, with the amount that is not prepaid covered by a surety mechanism or insurance, for materials licensees, or by surety, insurance, or a guarantee method for power reactor licensees. In a final rulemaking for power reactor financial assurance, the NRC allowed use of a parent company guarantee or self-guarantee with an external sinking fund (63 FR 50465; September 22, 1998). Analogous reasoning applies to materials licensees. This final rule makes conforming changes in the financial assurance requirements for materials licensees (10 CFR 30.35, 40.36, 70.25, and 72.30) to provide greater consistency with the 10 CFR Part 50 regulations. None of the

NRC materials licensees that have an obligation to provide decommissioning financial assurance currently use an external sinking fund.

This discussion of financial assurance to decommission a site pertains only to unrestricted use under 10 CFR 20.1402. If a licensee can demonstrate its ability to meet the provisions of 10 CFR 20.1403 for restricted use, financial assurance for long-term surveillance and control may be provided by a trust fund or by a government entity assuming ownership and custody of the site.

G. Why Might Some Materials Licensees Not Have Funds to Decommission Their Facility?

In SECY-03-0069, NRC evaluated licensee decommissioning experience and identified the following five reasons why some licensees may not have enough funds to complete their decommissioning activities.

1. Licensees at complex sites may underestimate decommissioning costs, if the assumption that the site will qualify for a restricted release proves incorrect. The cost for a restricted release is usually significantly lower than unrestricted release given the high offsite disposal costs of licensed material when compared to the cost of onsite controls. If it turns out that the licensee cannot meet the 10 CFR 20.1403 criteria for restricted conditions, the licensee may then not be able to meet its decommissioning financial obligations. To address this problem, this final rule amends 10 CFR 30.35, 40.36, 70.25, and 72.30 to require licensees to obtain NRC approval of their DFP based on a DCE for unrestricted release, unless the ability to meet the restricted release criteria can be adequately shown.

2. Certain operational events, particularly those that cause soil or ground-water contamination, can increase decommissioning costs if not addressed during the life of the facility. If the licensee does not identify these events, assess the problem in a timely manner, and update its DCE based on new conditions, the licensee may find it difficult to later meet its

decommissioning obligations. To address this problem, this final rule amends 10 CFR 20.1406 as discussed previously in Section II.A of this rule. Licensees also are required, in amendments to 10 CFR 30.35, 40.36, 70.25, and 72.30, to factor in residual radioactivity information in arriving at DCEs.

3. Certain financial assurance methods may not be effective in bankruptcy situations, given that funds held in them may be accessible to creditors. For example, title to property held in escrow remains with the licensee, making the property potentially vulnerable to claims by creditors. Another example is the parent and self-guarantees. The guarantees promise performance rather than payment. In the past, two companies used corporate reorganization to isolate the decommissioning obligations with the subsidiary company, but with insufficient funds to perform the work. In one case, the parent company reorganized without NRC approval and transferred to the subsidiary few assets and low levels of operating profits, so that the subsidiary was able to fund only a small portion of its decommissioning costs. In the second case, the parent company purchased the licensee before the time the financial assurance regulations were in effect. The licensee was permanently shut down after the purchase and was unable to provide full financial assurance. To address this problem, this final rule amends 10 CFR 30.35, 40.36, 70.25, 72.30, and 10 CFR Part 30 appendices A, C, D, and E by eliminating the use of an escrow account as a financial assurance option, and requiring a guarantor, as a condition of using the parent company guarantee and self-guarantee financial assurance options, to establish a standby trust fund and to submit to a Commission order, if the guarantor is in financial distress, to immediately pay the guaranteed funds into the standby trust.

4. The funds set aside by licensees to carry out decommissioning may decline in value over time. To address this problem, this final rule amends 10 CFR 30.35(h), 40.36(f), 70.25(h), and 72.30(g) to require that a licensee monitor the status of its decommissioning funds and, if necessary, add funds if the balance falls below the estimated cost of decommissioning.

5. The initial funding of a trust fund to cover the recurring costs of long-term surveillance and control for license termination under restricted release criteria may be inadequate if it is based on a high assumed rate of return for the trust fund. To address this problem, this final rule amends 10 CFR 20.1403 to require that licensees assume only a 1 percent real rate of return in establishing the initial funding amount.

H. Why Is 10 CFR 50.82 Being Amended?

Several power reactor licensees have successfully decommissioned their reactor sites consistent with 10 CFR Part 20 requirements. In some cases, reactor decommissioning costs have exceeded the initial DCE. For example, the Connecticut Yankee Nuclear Plant experienced higher decommissioning costs than planned, due in part to a larger volume of contaminated soil than was identified in the initial site characterization.

In the past, NRC has not required licensees to submit details of decommissioning costs on grounds that the typical reactor licensee was part of a public utility with access to substantial assets and revenues and that the minimum required amount for decommissioning financial assurance was adequate. A licensee's status as a regulated public utility provided access to cost of service rate recovery to help provide additional funds. A public utility had access to sales revenues to fund its obligations, even if rate recovery was limited.

Deregulation of the electric industry now permits a reactor licensee to operate as a merchant plant not subject to rate regulation or rate recovery of costs of service. When it ceases operation, it may have no sales revenues. The licensee may be organized as a separate company or a subsidiary of a holding company to isolate the risks and rewards of selling electricity on the open market. Without access to rate relief, no sales revenues, and with the licensee's owner protected by limited liability, shortfalls in decommissioning funding may jeopardize timely completion of decommissioning. This final rule provides NRC regulatory

authority to perform oversight to assure that the licensee anticipates potential shortfalls and takes steps to control costs to stay within its budget or obtain additional funds.

I. What Changes Are Being Made to 10 CFR 20.1406?

New 10 CFR 20.1406(c) states as follows:

> (c) Licensees shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the existing radiation protection requirements in Subpart B of this part and radiological criteria for license termination in Subpart E of this part.

The term "to the extent practical" is intended to limit the scope of this provision to actions that are already manifested in practice or action. The same phrase is used in existing 10 CFR 20.1101(b), which requires that licensees keep occupational and public radiological doses to ALARA levels. This final rule requires licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, including the subsurface, to achieve effective decommissioning planning. For operating facilities, significant residual radioactivity is a quantity that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402.

The current 10 CFR 20.1101 requirements are related to those in new 10 CFR 20.1406(c). Section 20.1101(a) requires each licensee to implement a radiation protection program to ensure compliance with the regulations in 10 CFR Part 20. The current 10 CFR 20.1101(b) requires each licensee to use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA. To achieve doses that are ALARA during facility operations and decommissioning, the § 20.1101(b) operating procedures and controls must apply to potential radiological hazards and to methods used by the licensee to minimize and control waste generation.

In furtherance of these existing requirements, new 10 CFR 20.1406(c) includes the term "residual radioactivity," as discussed previously in Section II.A of this rule. This new section applies to current licensee operations, in contrast to the § 20.1406(a) and (b) requirements which are imposed on license applicants. Residual radioactivity excludes background radiation. The licensees of large nuclear facilities will have performed an assessment of background radioactivity at their site as part of an Environmental Impact Statement required during the license application process. As a matter of standard operating practice, licensees will document the background level of radioactivity when a survey is performed at the site. Residual radioactivity, as defined in 10 CFR 20.1003, is not "residual radioactive material" as defined in 10 CFR 40.4 which is used only with respect to materials at sites subject to remediation under title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended.

The final rule's use of the term "subsurface" designates the area below the surface by at least 15 centimeters, as defined in NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual." Under this final rule, licensees must conduct their operations to minimize residual radioactivity that enters the subsurface at the site and if there are pathways that would allow the contamination to migrate, the licensee may need to monitor the ground water onsite for contamination based on site specific conditions. Based on past NRC experience, significant concentrations or quantities of undetected and unmonitored contamination, caused primarily by subsurface migration or ground water, has been a major contributor to a site becoming a legacy site and a potential radiological hazard.

Several hundred NRC materials licensees possess radioactive material and have liquid processes that could cause subsurface contamination. These licensees generally are compliant with regulations that limit effluent release to the environment over a specified time. Some of these licensees may not have documented onsite residual radioactivity, such as spills, leaks and onsite burials that may be costly to remediate during decommissioning and should be

considered in arriving at an accurate DCE. There have been instances of previously unidentified soil and ground-water contamination at uranium recovery and rare earth sites undergoing decommissioning in several states, notably Colorado and Pennsylvania. Two contributing factors to the accumulation of unidentified subsurface contamination is reluctance among some licensees to spend funds during operations to perform surveys and document spills and leaks that may affect site characterization, and to implement procedures for waste minimization.

The vast majority of NRC materials licensees do not have processes that would cause subsurface contamination. NRC's expectation is that these licensees, including those that release and monitor effluents of short-lived radionuclides to municipal sewer systems, will not be impacted by new 10 CFR 20.1406(c). The accumulation of radionuclides at municipal waste treatment facilities was the subject of an Interagency Steering Committee on Radiation Standards (ISCORS) study (NUREG-1775, November 2003, ADAMS accession number ML033140171), which concluded that these facilities do not have significant concentrations of long-lived radionuclides. Other classes of licensees that are, in general, not expected to introduce significant residual radioactivity into the subsurface include broad scope academic, broad scope medical, and small research and test reactors. Draft Regulatory Guide DG-4014, issued for public comment to support this final rule, describes an acceptable method for these licensees to evaluate the subsurface residual radioactivity.

Power reactor licensees have exhibited a high level of ALARA discipline with respect to effluent release and known spills and leaks. Current NRC regulations in § 20.1301, § 20.1302, and § 50.36a ensure that power reactor licensees maintain adequate monitoring and surveys of radioactive effluent discharges, with annual reporting requirements outlined in § 50.36a(2) that are made available to the public on the NRC web site. Several nuclear power plants have reported abnormal releases of liquid tritium, which resulted in ground-water contamination. To

address this issue, the Nuclear Energy Institute (NEI) developed voluntary guidance for licensees in the Industry Ground Water Protection Initiative (GPI). The voluntary GPI, implemented by all licensed power reactors as of September 2008, is a site-specific ground water protection program to manage situations involving inadvertent releases of licensed material to ground water and to provide informal communication to appropriate State/Local officials, with follow-up notification to the NRC as appropriate. On May 5, 2006, the NRC staff issued a revised baseline inspection module (Procedure 71122.01) used to inspect leaks and spills at power reactor sites.

J. What Surveys are Required Under Amended 10 CFR 20.1501(a)?

Before this final rule, § 20.1501(a) required licensees to perform surveys necessary to comply with Part 20 requirements, including surveys reasonable under the circumstances to evaluate potential radiological hazards. Slow and long-lasting leaks of radioactive material into the onsite subsurface may eventually produce radiological hazards and pose a risk for creation of a legacy site if contaminant characteristics are not identified when the facility is operating. The staff views radiological hazards as including those resulting from subsurface contaminating events, when these events produce subsurface residual radioactivity that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402. An effective approach to understand the extent of subsurface residual radioactivity is through the use of radiological surveys.

Appropriate surveys are essential for determining the adequacy of financial assurance for materials licensees, and need to be done periodically on a limited basis during operations when the DFP and financial assurance can be adjusted while the licensee is still generating revenue. This is far superior to the current practice at some facilities to delay even limited survey work of the site until after the facility has been shut down.

Facilities that process large quantities of licensed material, especially in fluid form, have the potential for causing significant environmental contamination. Leaks from these facilities can lead to large amounts of radioactive contamination entering the subsurface environment over an extended time. The estimated doses from this contamination are below the limits in 10 CFR Part 20 that would initiate immediate regulatory action. Another factor the staff considered in preparing this final rule is the high cost to dispose of radioactive materials offsite. These costs are a concern even when the material contains relatively low concentrations of radioactivity. A continued trend of high disposal costs could increase the number of environmental contamination incidents at operating facilities, resulting in higher decommissioning costs. A third factor that may contribute to future legacy sites is the delayed identification of contamination on the site. Over a long time, contamination that migrates in subsurface soil or ground water does not cause immediate exposure to either workers or the public that approach the limits specified in 10 CFR Part 20. It is only after operations have ceased when the possible results of unlimited access to the site, and associated exposure pathways (i.e., ingestion and inhalation) are being evaluated, that the volume of contamination has become apparent.

As discussed previously in Section II.A of this rule, amended 10 CFR 20.1501(a) requires licensees to perform contamination surveys to comply with current 10 CFR Part 20 requirements, and the new § 20.1406(c) if there is a history of leaks or spills to the subsurface at the site. The magnitude and extent of radiation levels are typically defined in units of radioactivity measurement, such as in micro-rem per hour (μrem/hr). The concentrations or quantities of residual radioactivity are typically defined in units of radioactivity associated with a specific radionuclide, for example picocurie per liter of tritium (pCi/L of H-3).

The amended § 20.1501(a) retains previous survey requirements and specifies that such requirements include consideration of subsurface residual radioactivity. Survey requirements

may include ground-water monitoring if reasonable under the site specific conditions. Soil sampling also may be warranted based on site specific conditions, for example if there is no ground-water monitoring at the site or if known subsurface contamination has not migrated to the ground water. Draft Regulatory Guide DG-4014, issued for public comment to support this final rule, describes a variety of acceptable methods to evaluate subsurface characteristics. The NRC recognizes that ground-water monitoring may be a surrogate for subsurface monitoring at some sites, that soil sampling may be appropriate at other sites, and that there are sites with no subsurface residual radioactivity where the existing monitoring method is appropriate. Also, the NRC recognizes that an area within the footprint of a building, during licensed operations, may not be a suitable area for subsurface residual radioactivity surveys if the process of sampling would have an adverse impact on facility operations. The decision to perform subsurface residual radioactivity sampling in a particular area should be balanced against the potential to jeopardize the safe operation of the facility. The purpose of amended 10 CFR 20.1501(a) and new 20.1406(c) is to specify that compliance with 10 CFR Part 20 survey and recordkeeping requirements is necessary to demonstrate compliance with existing regulations and to plan effectively for decommissioning, including effects from subsurface contamination.

Final rule amendments to 10 CFR 30.35(e)(2), 40.36(d)(2), 70.25(e)(2), and 72.30(c) require licensees who have a DFP or a License Termination Plan to factor in the results of surveys, performed under § 20.1501(a), in estimating decommissioning costs. This requirement applies only to licensees who are required to have a DFP, and assures that these licensees properly consider the extent of subsurface residual radioactivity in their DCE, thus improving decommissioning planning and helping to reduce the likelihood of future legacy sites.

For the materials licensees with a certified amount as decommissioning financial assurance, NRC assumes their current monitoring methods are adequate. If these licensees

detect onsite contamination that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402, the licensees are required to submit for approval by the NRC a DFP with a DCE.

For the materials licensees who are not required to have financial assurance for decommissioning based on a license possession limit that is below the financial assurance threshold values in appendix B of 10 CFR Part 30, NRC's expectation is that the monitoring performed under amended § 20.1501(a) would be of a simple form, as discussed in draft Regulatory Guide DG-4014. Simple form monitoring is a method that confirms the absence of leaks or spills to the subsurface. The risk is low that any of these sites would cause contamination to create a potential radiological hazard or a future legacy site.

On the effective date of this final rule, NRC's expectation is that no additional surveys will be required of power reactor licensees and fuel cycle facilities. For power reactors, NRC staff concludes that the monitoring and survey processes and related reports prepared at power reactor sites will likely contain sufficient information to satisfy new § 20.1406(c) and amended § 20.1501 requirements. NRC is not requiring licensees to submit reports, but the information must be kept onsite in records that are available for review. It is not expected that power reactor licensees will need to immediately install additional monitoring equipment or modify existing operating procedures to satisfy the amended § 20.1501(a) requirements. But, it may be necessary for such licensees to take these actions if, for example, significant residual radioactivity is identified at a power reactor site at a level higher than had been previously identified. In any such situations, the need for additional monitoring will be determined on a case-by-case basis.

Fuel cycle facilities, such as uranium fuel fabrication plants, the gaseous diffusion enrichment plants, and the dry process natural uranium conversion/de-conversion facility, also perform surveys to detect radioactive release to the ground water. NRC staff concludes that the

monitoring and survey processes and related reports prepared at these facilities likely would contain sufficient information to satisfy § 20.1406(c) and § 20.1501 requirements. A high level of ALARA discipline for onsite spills and leaks is expected of the centrifuge enrichment plants and mixed oxide fabrication plant based on the information in their license applications (these facilities have not begun operations).

K. What Information Must the Licensee Collect under Amended 10 CFR 20.1501?

NRC is requiring, at certain facilities that have significant subsurface contamination, licensee documentation of contaminating events and survey results, including ground-water monitoring surveys, and the retention of survey records until license termination, to facilitate later decommissioning of the facility.

For 10 CFR 20.1501(a), licensees must be able to demonstrate compliance with the regulations in Part 20 through surveys that evaluate the magnitude and extent of radiation levels, and concentrations or quantities of residual radioactivity including that in the subsurface, and any potential radiation hazards of the radiation levels and residual radioactivity detected. The sampling results should include the date, time, location, contaminants of interest and contamination levels, and the concentrations at which action is required to comply with regulations. The contaminants of interest are those used within the facility with half-lives long enough that they would require remediation during decommissioning to meet the unrestricted use criteria under 10 CFR 20.1402. Contaminants may also include both chemicals and radionuclides in the ground water from sources upstream of the NRC-licensed site because of the potential for interaction with releases from other sites. When ground water is being monitored, the surveys conducted by the licensee also should include hydro-geologic evaluations that lead to a determination of effective sampling and analysis, including accurate placement and installation of the wells, and well locations to determine the nominal ground

water flow direction and preferential flow paths for each "aquifer" underlying the site. Licensees may need to perform surveys to demonstrate compliance with the new 10 CFR 20.1406(c).

For 10 CFR 20.1501(b), licensees must document the records from surveys of subsurface residual radioactivity at the site as records important for decommissioning, under the requirements of § 30.35(g), § 40.36(f), § 50.75(g), § 70.25(g), and § 72.30(d). Significant residual radioactivity that must be documented in these records would include onsite subsurface residual radioactivity that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402 [73 FR 3815 c. 1]. These records can be as simple as a description of the contaminating event, to include date, time, location, and the estimated quantities and activity levels of radioactive materials that were spilled or leaked. The documentation may describe the activation of a moisture alarm system used to indicate the presence of liquid in an area that is supposed to be dry. Contamination survey results must be included in these records if the surveys are considered important for decommissioning planning.

L. How Will Licensees Report Required Information to the NRC?

There are no reporting requirements for licensees under amendments to 10 CFR 20.1406(c) and 20.1501.

Instead, NRC requires licensees to collect information and to have that information available for review. The information must be retained by licensees in records important for decommissioning under § 30.35(g), § 40.36(f), § 50.75(g), § 70.25(g), and § 72.30(d).

Under amendments to financial assurance regulations, under § 30.35(e), § 40.36(d), Part 40 appendix A Criterion 9(b), § 70.25(e), and § 72.30, reporting requirements would increase for materials licensees who must prepare a detailed cost estimate for decommissioning. Reporting requirements also increase based on amended § 50.82(a) for

power reactor licensees who prepare a post-shutdown decommissioning activities report (PSDAR) or an annual financial assurance status report.

Under amendments to 10 CFR Part 30, appendix A, licensees who use the parent company guarantee as financial assurance for decommissioning will have increased reporting requirements in changes to the paragraph A.1 financial test, and in reporting of off-balance sheet transactions and verification of bond ratings, and in annual documentation of continuing eligibility to use the parent company guarantee. Licensees who use the self-guarantee as financial assurance for decommissioning under 10 CFR Part 30, appendices C, D, and E, also have increased reporting requirements in changes to report off-balance sheet transactions and annual documentation of continuing eligibility to use the self-guarantee.

Licensees will continue to submit information to the NRC by certified mail or through approved Electronic Information Exchange (EIE) methods.

M. What Financial Assurance Information Must Licensees Report to the NRC?

Materials licensees with a license possession limit that is below the financial assurance threshold in 10 CFR Part 30, appendix B, are not required to have financial assurance for decommissioning. For licensees under 10 CFR Parts 30, 40, and 70 with a license possession limit above the financial assurance threshold in 10 CFR Part 30, appendix B, but below the threshold requiring a DFP, these licensees have an option of providing financial assurance based on an amount specified by regulation or based on a DFP with a site-specific cost estimate. Materials licensees with a license possession limit above the financial assurance threshold, and all 10 CFR Part 72 licenses, must submit at intervals not exceeding 3 years, a DFP which includes a site-specific cost estimate, a description of the methods used to assure the funds, and a description of the means of adjusting the cost estimate. The required contents of the DFP are changing as a result of this final rule, as discussed in Section II.P of this rule.

Except for 10 CFR Part 72 licensees, materials licensees must also provide a signed original of the financial instrument obtained to satisfy the financial assurance requirement.

For materials licensees, Chapter 4 in NUREG-1757, Volume 3, revision 1, "Consolidated NMSS Decommissioning Guidance," provides details on information necessary to satisfy their financial assurance requirements. This document is available on the NRC website at: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/. This document has been updated to include new requirements resulting from this final rule.

Power reactor licensees, as required by 10 CFR 50.75(f)(1), must report on the status of their decommissioning funds at 2-year intervals. A power reactor licensee that is within 5 years of the end of its projected life, or will close within 5 years (before the end of its licensed life), or has already closed, must submit the report of funds status on an annual basis.

Applicants for power reactor and non-power reactor licenses, and reactor license holders, must submit a decommissioning report as required by 10 CFR 50.33(k). The decommissioning report is submitted once, and contains information indicating how reasonable assurance will be provided that funds will be available to decommission the facility, the method used to provide funds for decommissioning, and the means for adjusting periodically the amount to be provided. The reporting requirements of decommissioning fund status, and of the licensee's management of irradiated fuel, are changing as a result of this final rule, as discussed in Section II.R of this rule.

For nuclear power reactor licensees, Chapter 2 in Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," provides details on the information necessary to satisfy their financial assurance requirements. This document is available on the NRC website at: http://www.nrc.gov/reading-rm/doc-collections/reg-guides/power-reactors/active/.

N. What Changes Are Being Made to Financial Assurance Regulations?

Most of the final rule amendments are changes to financial assurance regulations for materials licensees. A few changes apply to decommissioning financial assurance for power reactor licensees. The changes to financial assurance regulations are discussed in this section, under the following headings:

N.1 Require a trust fund for decommissioning under restricted release.

N.2 Require a trust fund for the prepayment option.

N.3 Require an upfront standby trust fund for the parent guarantee and self-guarantee options.

N.4 Require parent company to inform NRC of financial distress and submit to an Order.

N.5 Require guarantor payment immediately due to standby trust.

N.6 Allow intangible assets, with an investment grade bond, to meet some financial tests.

N.7 Increase the minimum tangible net worth for the guarantees' financial tests.

N.8 Clarify guarantees' bond ratings and annual demonstration submittals.

N.9 Invalidate the use of certification for financial assurance if there is contamination.

N.10 Other changes to financial assurance regulations.

Many of the financial assurance amendments had been in NRC guidance and are being codified in this final rule. The amendments strengthen and clarify the financial assurance requirements. The NRC seeks to improve decommissioning planning and reduce the number of funding shortfalls caused in the past by (1) Overly optimistic decommissioning assumptions; (2) Lack of adequate updating of cost estimates during operation; and (3) Licensees falling into financial distress with financial assurance funds unavailable for decommissioning. The changes increase licensee reporting requirements. The added reporting burden is estimated as part of the Paperwork Reduction Act Statement, discussed in Section IX of this rule. The costs and benefits of this final rule are evaluated in the regulatory analysis, discussed in Section X of this rule.

N.1 Require a trust fund for decommissioning under restricted release.

NRC is amending the regulations related to decommissioning financial assurance applied to planned restricted release sites.

This final rule requires, under § 20.1403(c), that the funds for financial assurance of long-term care and maintenance of a restricted release site must be placed into a trust segregated from the licensee's assets and outside the licensee's administrative control.

This amendment eliminates, as prepayment options, the escrow account, sureties and insurance, and the parent company and self-guarantee methods at restricted release sites. To date, no licensee has chosen to use these financial assurance mechanisms at a restricted release site. These mechanisms were eliminated because they possess characteristics that make their use inadvisable in the types of long-term care and maintenance situations involved in restricted release sites. The final rule continues to permit government entities to use a statement of intent or to assume custody and ownership of a site.

Escrow accounts are not well suited to the protection of funds over a long term. The purpose normally served by an escrow is to collect or hold funds for an expense to be paid in the relatively near future (e.g., property tax escrows). The EPA concluded that a trust was more protective of funds because, under trust law, the title to property in a trust is transferred to the trustee (46 FR 2802, 2827; January 12, 1981). In an escrow account, title to the property remains with the grantor. Thus, escrow property is more likely to be subject to a creditor's claim than property held in trust. In addition, the law of trusts places obligations on the trustee to act in the interest of the beneficiary. In contrast, an escrow agent is responsible only for what is specified in the escrow agreement. The EPA concluded that it would be extremely difficult to draft an escrow agreement that adequately specifies all the actions that an escrow agent would need to take in all situations to assure the instrument served its intended purpose.

The surety methods and insurance also are not well suited to protect funds over the long term because these depend on contracts made by the former licensee. There are no actual funds set aside for future costs; rather, the methods are promises made by the issuer to pay at a future time. These methods require renewal to remain effective. They depend on the former licensee continuing to exist to make renewal payments for the surety or insurance instruments. The instrument lapses if the payments are not made. Under the existing rule, NRC may require the issuer to pay the face amount before the lapse occurs. However, issuers may resist making the payment, which could delay obtaining (and possibly reduce) the amount of funds for long-term care and maintenance. Whether making the payment is resisted or not, when the funds are paid for the face amount, the funds will be placed in a trust account. That is, the response to the non-renewal of a surety is to create a trust to hold funds. The long-term nature of the obligation increases the possibility that circumstances may arise that would require a demand for payment. In view of the potential difficulties and delays, and recognizing that a trust fund is the preferred long-term instrument for holding funds, the surety and insurance methods of financial assurance for long-term maintenance and control have been eliminated.

Likewise, the parent company and self-guarantee mechanisms are not well suited for providing financial assurance at restricted release sites because these were designed to assure funding for the relatively limited time needed to complete most decommissioning projects under 10 CFR 20.1402. The former licensee, or its parent, must continue to exist to pay for long-term control and maintenance costs. If the former licensee, or its parent, ceases to exist, the self-guarantee or parent company guarantee have no source of funds to pay the costs. In addition, these guarantees presume the existence of a licensee subject to NRC authority. However, when the license is terminated, the NRC has no regulatory authority over the former licensee. Therefore, the self-guarantee and parent company guarantee have been eliminated as financial assurance options at restricted release sites.

In contrast, the trust fund is best suited as a financial mechanism to assure the necessary long-term care and maintenance at restricted release sites. The trust fund can exist for long periods without need for renewal. It exists independently of the former licensee, and can continue to serve the purposes of control and maintenance even if the former licensee ceases to exist. The trustee has a fiduciary duty to serve the beneficiaries of the trust. The funds placed in the trust become property of the trust, and generally cannot be reached by creditors of the former licensee. Trust funds have traditionally been used to provide for the long-term care and maintenance of parks and other public facilities, to care for cemeteries, and for similar purposes. This final rule requires the use of trust funds for the financial assurance for long-term care and maintenance at restricted release sites, unless a government entity provides long-term funding or assumes custody and ownership of the site.

A further change to 10 CFR 20.1403(c)(1) requires that the initial amount of the trust fund established for long-term care and maintenance be based on a 1 percent annual real rate of return on investment. A similar provision is currently contained in 10 CFR Part 40, appendix A, Criterion 10, which provides that if a site-specific evaluation shows that a sum greater than the minimum amount specified in the rule is necessary for long-term surveillance following decontamination and decommissioning of a uranium mill site, the total amount to cover the cost of long-term surveillance must be that amount that would yield interest in an amount sufficient to cover the annual costs of site surveillance, assuming a 1 percent annual real rate of interest.

The NRC concluded that a conservative estimate of the annual real rate of return is justified in the case of financial assurance for long-term care and maintenance under § 20.1403(c)(1). Although the NRC in 10 CFR 50.75(e)(1)(ii) allows a licensee of a nuclear power reactor that is using an external sinking fund to take credit for projected earnings on the external sinking funds (using up to a 2 percent annual real rate of return from the time of the

future fund's collection through the decommissioning period), the reactor situation is distinguished by the continuing presence of the reactor licensee, who is obligated to provide additional funds if necessary. Long-term trust funds for surveillance and control are created when license termination relieves the licensee of any further obligation regarding the site. Therefore, no licensee is available to make up shortfalls in the fund, which reduces the likelihood that funds will be available when needed. A long period of low returns could deplete a trust fund so that later higher returns would be insufficient to return the fund to the value needed to permit earnings to cover the recurring long-term costs. Consequently, a conservative rate of return is necessary to assure that funds will be available when needed. Over 1975-2005, the annual real rate of return was 1.58 for U.S. Treasury Bills and 4.87 for government bonds. Thus, a 1 percent real rate of return is conservative and appropriate for assuring funds under the amended § 20.1403(c)(1). The actual rate of return may exceed the 1 percent real rate. The trust agreement may contain provisions to return excess funds to the trust grantor if the fund balance significantly exceeds the amount needed to cover the recurring costs at the 1 percent rate.

This final rule adds a new § 20.1404(a)(5) specifying that one of the factors that the Commission must consider in determining whether to terminate a license under alternate criteria is whether the licensee has provided sufficient financial assurance to enable an independent third party (including a government custodian of a site) to assume and carry out responsibilities for any necessary control and maintenance of the site. This new section also explicitly states that the financial assurance be in the form of a trust fund, as in §20.1403(c).

N.2 Require a trust fund for the prepayment option.

The final rule amends the list of prepayment financial methods that may be used to provide financial assurance for decommissioning to provide that prepayment shall only be in the form of a trust established for decommissioning costs (§ 30.35(f)(1), § 40.36(e)(1), § 70.25(f)(1),

and § 72.30(c)(1)). The final rule eliminates the four other prepayment options that had been listed in those sections of the regulations (i.e., the escrow account, government fund, certificate of deposit, and deposit of government securities). Three of these options (the government fund, certificate of deposit, and deposit of government securities) initially were authorized for use to provide alternatives to licensees that elected not to use a trust fund as their prepayment mechanism, even though the NRC recognized that in the event of the licensee's bankruptcy, they provided somewhat less assurance that the funds would remain available to pay for decommissioning. However, no NRC licensees have elected to use the government fund and deposit of government securities options, and only two have used a certificate of deposit. Because of their relative risk in bankruptcy and their non-use by licensees, the NRC has eliminated them as alternatives for providing financial assurance for decommissioning.

The NRC recognizes that elimination of the escrow account option will affect some materials licensees who currently use escrows. Approximately 25 escrows are in use as a prepayment option for decommissioning financial assurance. Because some materials licensees use more than one escrow, the number of materials licensees using escrows is slightly less than the number of escrows.

The staff reviewed several studies of the situation of escrows in bankruptcy, and concluded that the most accurate summary of the various assessments is as follows. The funds contained in escrows that are set up correctly before a licensee's entry into bankruptcy will likely be secure from transfer into the bankruptcy estate as assets of the debtor and they will not be reachable by the bankruptcy trustee using doctrines of fraudulent conveyance or voidable preference. However, correctly setting up an escrow is difficult, as noted in Section II.N.1 of this rule. The NRC also is concerned that a determination of the legal status of an escrow may be subject to considerable delay. In addition to the time necessary to carry out a legal standing analysis, a bankruptcy trustee could attempt to use the automatic stay provisions of the

bankruptcy code to stop payment by an escrow agent under the escrow, if that payment is occurring following the commencement of the bankruptcy action. While this attempt may fail, it could postpone the NRC's access to the funds held in the escrow and thereby preclude the prompt commencement of decommissioning. Finally, the administrative costs of a trust fund are comparable to an escrow, so there is little economic benefit to using the escrow.

Elimination of the use of escrow accounts by materials facilities was discussed at the public stakeholder meeting held January 10, 2007. No stakeholders objected to the elimination of the escrow as a financial assurance method. Two comments on this topic were received during the proposed rule public comment period. Both comments disagreed with NRC elimination of the escrow account used for financial assurance. For reasons discussed previously, NRC disagrees with these comments and has eliminated the escrow as an approved method for materials licensees to provide financial assurance. The escrow account may continue to be used by power reactor licensees, pursuant to 10 CFR 50.75. The technical basis for the Decommissioning Planning proposed rule did not include removal of the escrow account from 10 CFR 50.75 and so this change was not made during this rulemaking.

N.3 Require an upfront standby trust fund for parent guarantee and self-guarantee options.

The final rule amends appendices A, C, D, and E to 10 CFR Part 30 (amend Section III.D of appendix A; amend Section III.F and add a new Section III.G to appendix C; amend Section III.D and add a new Section III.E to appendix D; and add a new Section III.F to appendix E). The amendments require a parent company providing a parent company guarantee and a licensee providing a self-guarantee to set up a standby trust before they may rely on the guarantee for financial assurance, and specify criteria for selecting an acceptable trustee.

Before this final rule, the regulations did not require the guarantor to set up a standby trust before providing a parent company or self-guarantee. Instead, a standby trust would need to be set up and used to hold funds for decommissioning only in the event that the NRC required the guarantor to provide such funding for decommissioning. Setting up a standby trust at the time the guarantee is drawn upon could lead to a significant delay, and therefore creation of a standby trust at the commencement of the guarantee was recommended in regulatory guidance. A standby trust is necessary because the NRC cannot accept decommissioning funds directly. Under the "miscellaneous receipts" statute, 31 U.S.C. 3302(b), the NRC must turn over all payments received to the U.S. Treasury. Therefore, a standby trust is necessary to receive funds in the event the NRC requires the guarantor to put the funds into a segregated account. Creating a standby trust before the guarantee is provided avoids potential delays in initiating decommissioning that may be caused by delays in setting up the trust at a later date. In addition, the use of a trust protects the funds from creditors' claims, which may be necessary in the event the guarantor faces financial distress. Therefore, the final rule requires that the guarantor set up a standby trust. In addition, the final rule provides that the Commission has the right to change the trustee. That power is necessary to assure that the trustee will faithfully execute its duties. Finally, to assure the trust agreement is adequate, the final rule specifies that an acceptable trust is one that meets the regulatory requirements of the Commission.

N.4 Require parent company to inform NRC of financial distress and submit to an Order.

Because a parent company is not usually an NRC licensee subject to the NRC's authority, an amendment in this final rule specifies that the parent company guarantee option must include a contractual agreement by the parent company to submit to NRC payment orders (10 CFR Part 30, appendix A, Section III.F).

Before this final rule, the parent company had no requirement to inform the NRC of financial distress that may adversely affect its ability to meet its guarantee obligations. Because

the NRC needs to know if the parent guarantor is in financial distress to take steps to protect the funds guaranteed for decommissioning, the final rule requires the parent guarantor to notify the NRC in case of its financial distress, and its plan to transfer the guaranteed amount to the standby trust. In these situations, payments from the parent company are immediately due and payable to the standby trust pursuant to an acceleration clause, discussed in Section II.N.5 of this rule. A similar notification requirement is not necessary for a licensee guarantor because NRC regulations under 10 CFR 30.34(h), 40.41(f), 70.32(a)(9), and 72.44(a)(6) already require licensees to notify NRC of bankruptcy proceedings.

N.5 Require guarantor payment immediately due to standby trust.

Before this final rule, the regulations did not address the possibility that the guarantor of the parent guarantee or self-guarantee may be in financial distress when it is required to provide alternate financial assurance. In cases where decommissioning is not being conducted at the time of an insolvency proceeding, creditors could argue that the debtor owes performance of decommissioning in the future, not money at the present time. That argument could potentially support a finding that no payment is owed to the standby trust. In that event, a division of assets to satisfy creditors' claims may not adequately protect resources needed to fund decommissioning. To provide a money claim on the assets of the guarantor that would cover the cost of decommissioning at the time of a division of assets, the final rule authorizes the Commission to make the amount guaranteed immediately due and payable to the standby trust (i.e., an acceleration clause).

This amendment also clarifies that the guarantor's obligation is not capped at the guaranteed amount, but includes costs in excess of the guaranteed amount if additional funds are required to complete decommissioning and termination of the license.

N.6 Allow intangible assets, with an investment grade bond, to meet some financial tests.

NRC regulations allow guarantees to be used as financial assurance for decommissioning by companies whose financial statements demonstrate a low risk of default for corporate obligations. A set of financial tests are prescribed in 10 CFR Part 30, appendices A, C, D, and E for companies who may qualify to use the guarantee methods. A requirement to use the parent company guarantee or self-guarantee as a financial assurance option is passing the tests on an annual basis. Some of the financial tests in 10 CFR Part 30, appendices A, C, and E are done using bond valuations. In the past, only tangible assets were considered within the calculations performed under the financial tests. In response to an inquiry during the public stakeholder meeting on January 10, 2007, NRC staff considered whether allowing the use of intangible assets would materially increase the risk of a shortfall in decommissioning funds. Staff concluded the risk of a shortfall in funding would not materially increase by allowing the use of intangible assets in conjunction with certain bond valuations of the guarantor.

Financial accounting standards issued since the original decommissioning regulations were issued in 1988 now provide objective methods to value intangible assets. The change in accounting standards provides assurance that intangible asset valuation is reasonable. In addition, bond rating agencies include intangible assets in their evaluation of the financial stability of a company's bonds. This provides an independent check of the reasonableness of the company's valuation of its assets. The default rate remains low for bonds rated investment grade. To further assure a current bond rating adequately reflects the company's financial stability, amendments in the final rule specify that the bond must be uninsured, uncollateralized, and unencumbered to be used in the financial test. Finally, the value of the nuclear facilities, both as tangible and intangible assets, are excluded from the calculation of net worth on grounds that those assets would not be available to produce funds for decommissioning after the facility is shut down. The staff concluded that permitting the use of intangible assets in

conjunction with an investment grade bond rating would not materially increase the risk of a shortfall in decommissioning funding.

In addition, the guarantee methods require annual repassage of the test. Historical trends in bond ratings show that the time between receiving a rating that is below investment grade to the time of default is 5 years, on the average. The annual repassage requirement will normally provide adequate time for the guarantor to obtain alternative financial assurance. For the few cases where a default may occur in a short time, the acceleration clause discussed in paragraphs N.4 and N.5 of this section, will provide a method to obtain funds in situations of financial distress.

Therefore, this final rule will allow the use of intangible assets, used in conjunction with an investment grade bond rating, to meet specified criteria in the financial tests for parent company and self-guarantees.

N.7 Increase the minimum tangible net worth for the guarantees' financial tests.

Before this final rule, the financial tests in appendices A and D to 10 CFR Part 30 each required the entity seeking to pass the relevant financial test to have tangible net worth of at least $10 million, and the financial test in appendix C to 10 CFR Part 30 required the applicant or licensee to have tangible net worth at least 10 times the current DCE or certification amount for decommissioning. The final rule amendments require tangible net worth of at least $21 million in each of the financial tests in appendices A, C, and D to 10 CFR Part 30.

The $10 million in tangible net worth requirement was first adopted by the EPA in 1981, and the financial test adopted by the NRC in 1988 used the same criterion. The NRC believes that the criterion should be adjusted to represent the value in current dollars of $10 million in 1981. For the proposed rule, the NRC calculated a new tangible net worth amount using the 2005 Implicit Price Deflator for Gross Domestic Product published by the U.S. Department of Commerce in its Survey of Current business, and the equivalent Implicit Price Deflator for 1981,

to arrive at a value of $19 million to represent the $10 million value (1981 dollars) in 2005 dollars. NRC agrees with a comment submitted on the proposed rule to escalate the 1981 dollars to 2007 dollars. This calculation, rounded up in units of one million dollars, equals $21 million.

The final rule adds a requirement in Section II.A.(1) of appendix C to 10 CFR Part 30 for tangible net worth of at least $21 million. Before this final rule, that component of the financial test for self-guarantee specifies only that the applicant or licensee must have tangible net worth at least 10 times the current DCE or certification amount. The amendment specifies tangible net worth of $21 million and 10 times the amount required. This amendment makes the self-guarantee financial test in appendix C to 10 CFR Part 30 consistent with the tests in appendices A and D to 10 CFR Part 30.

N.8 Clarify guarantees' bond ratings and annual demonstration submittals.

The final rule amendments specify that the current rating of the most recent bond issuance of AAA, AA, or A by Standard and Poor's could include adjustments of + or - (i.e., AAA+, AA+, or A+ and AAA-, AA-, and A- would meet the criterion) and the current rating of Aaa, Aa, or A by Moody's could include adjustments of 1, 2, or 3.

Standard and Poor's and Moody's have introduced the plus or minus and numerical adjustments to refine the precision of their ratings. As a result, licensees have been uncertain whether a rating that includes these adjustments, and in particular ratings that might be considered below the unadjusted ratings specified in the appendices (e.g., A-) could be used. Based on the minimal difference in default rate associated with the qualifiers, the final rule states that all the bonds within a specified rating level meet the regulatory standard.

In addition, the final rule amends Section II.A.2.(i) of appendix A to 10 CFR Part 30 and Section II.A.(3) of appendix C to 10 CFR Part 30 to require the bond to be the most recent "uninsured, uncollateralized, and unencumbered" bond issuance. This amendment makes the

bond criterion in appendix A to 10 CFR Part 30 and appendix C to 10 CFR Part 30 consistent with the bond criterion in appendix E to 10 CFR Part 30. As explained in NUREG/CR-6514, where a rated bond has insurance or pledged assets to provide additional security, the bond rating may not directly reflect the creditworthiness of the bond issuer. Therefore, the final rule adds the requirement that the bond rating used to pass the financial test must be uninsured, uncollateralized, and unencumbered.

The final rule makes a conforming change in Section III.E. of appendix E to 10 CFR Part 30 to provide that if, at any time, the licensee's most recent bond issuance ceases to be rated in any category of "A-" and above by Standard and Poor's or in any category of "A3" and above by Moody's, the licensee no longer meets the requirements of the financial test.

The final rule amendments to the bond rating criterion in appendices A and C to 10 CFR Part 30 are intended to clarify the intent of the rule, eliminate an unintended apparent inconsistency among the different financial tests that may be used, and to make administration of the financial assurance requirements more efficient by eliminating recurring questions.

The final rule requires a certified public accountant to verify that a bond rating, if used to demonstrate passage of the financial test, meets the requirements. Some financial tests received by the NRC did not apply the requirement correctly. Requiring an audit of the bond rating will minimize the potential that an error is made in verification of the bond rating.

Before this final rule, the regulations required the licensee to repeat passage of the financial test each year, but the regulations did not explicitly state that the licensee must annually submit documentation to the NRC to verify its passage of the test. However, the parent company and self-guarantee agreements illustrated in regulatory guidance include a provision that the licensee will annually submit to NRC revised financial statements, financial test data, and an auditor's special report. Submittal of the documents permits NRC to verify the licensee's continuing eligibility to use the parent company guarantee without incurring the

expense of an onsite inspection. Therefore, the final rule codifies the regulatory guidance to require annual submittal of documentation that the guarantor passed the financial test.

Before this final rule, the regulations were unclear in stating that the parent company guarantee and financial test remain in effect until the license is terminated. The final rule clarifies that the NRC's written acceptance of an alternate financial assurance by the parent company or licensee allows the guarantee and financial test to lapse.

N.9 Invalidate the use of certification for financial assurance if there is contamination.

This final rule amends regulations to add new requirements related to decommissioning financial assurance as applied to certifications. The changes affect § 30.35(c)(6), § 40.36(c)(5), and § 70.25(c)(5).

Before this final rule, the regulations prescribed specific amounts of financial assurance for licensees that are authorized to possess relatively small amounts of radioactive material. Licensees authorized to possess radioactive materials in higher amounts must submit a DFP, which includes a site-specific cost estimate for decommissioning. The site-specific cost estimate is almost always higher than the prescribed certification amounts.

This final rule requires licensees who qualify to use the certification amounts to submit a DFP in the event that survey results detect significant residual radioactivity within the site boundary, including the subsurface. A significant amount would be residual radioactivity that would, if left uncorrected, prevent the site from meeting the criteria for unrestricted use. Remediating subsurface contamination can be very expensive. However, licensees that qualify to use the certification amounts have no regulatory requirement to increase the amount of financial assurance to cover subsurface remediation costs. In the event subsurface contamination occurs at such a site, this final rule provides the regulatory basis to require these licensees to cover the full cost, not just the certification amount.

N.10 Other changes to financial assurance regulations.

This final rule eliminates the line of credit option from 10 CFR 30.35(f), 40.36(e), 50.75(e)(1)(iii)(A), 70.25(f), and 72.30(e) from the list of surety, insurance, or other guarantee methods that may be used to provide financial assurance for decommissioning. Although the line of credit was initially authorized for use to provide an alternative to licensees that elected not to use a surety or letter of credit, the NRC recognized that it posed a greater risk than the other two surety methods, because it might be subject to underlying loan covenants that could make it more vulnerable to cancellation if the licensee experienced financial difficulties. However, since 1988, no NRC licensees have elected to use a line of credit to provide financial assurance for decommissioning. Because of its greater risk of cancellation and its non-use by licensees, the NRC has decided to eliminate the line of credit as an alternative for providing financial assurance for decommissioning.

The final rule excludes, in the financial tests for the parent guarantee and self-guarantee, the net book value of the nuclear facility and site from the calculation of tangible net worth. Before this final rule, the regulations required that the calculation of tangible net worth must exclude the book value of the "nuclear units." That requirement lead to confusion because some interpreted it to apply to nuclear reactor units, and not other kinds of nuclear facilities. However, other kinds of nuclear facilities should be excluded from the tangible net worth calculation because they are unlikely to provide funds for decommissioning. The existing rule does not specify whether the nuclear site, as distinguished from the facility, may be included in the calculation of tangible net worth. The value of the site is likely to depend on the probability that the decommissioning will be completed, and is subject to some degree of uncertainty. Therefore, the calculation of tangible net worth has been changed to exclude the net book value of the nuclear facility and site.

The final rule requires a certified public accountant to include an evaluation of off-balance sheet transactions, for the parent guarantee and self-guarantee. Generally accepted accounting principles (GAAP) permit certain kinds of transactions to be accounted for off the company's balance sheet. Many companies, as a means of managing risk and/or taking advantage of legitimate tax minimization opportunities, create off-balance-sheet transactions. It is important to understand the nature and the reason for each off-balance-sheet item, and ensure that any such relationships are adequately disclosed. (*Management's Summary of Off-Balance Sheet Transactions*, American Institute of Certified Public Accountants, http://www.aicpa.org, last visited February 8, 2007). The volume and risk of the off-balance-sheet activities need to be considered (*Risk Management Manual of Examination Policies*, Federal Deposit Insurance Corporation, http://www.fdic.gov, last visited February 8, 2007). Before this final rule, the regulations did not require the independent certified public accountant's special report to examine off-balance sheet transactions. However, these transactions have the potential to materially affect the guarantor's ability to fund decommissioning obligations. Therefore, the final rule requires the auditor to include an evaluation of off-balance sheet transactions.

O. Will Some Licensees Who Currently Do Not Have Financial Assurance Need To Get Financial Assurance?

No. Licensees who are not required to provide financial assurance for decommissioning will not have to obtain financial assurance as a result of amendments in this final rule.

The decommissioning planning and financial assurance amendments in this final rule only apply to licensees who currently have, or will have in the future, decommissioning financial assurance requirements under 10 CFR 30.35, 40.36, 50.75, 70.25, and 72.30.

If a licensee has survey records of residual radioactivity that were performed under the new requirements in § 20.1501(b) or in an application for license transfer consistent with the amended language in § 30.34(b)(2), § 40.46(a)(2), or § 70.36(a)(2), and the licensee has a possession and use quantity that is below the possession limit thresholds for financial assurance, then no decommissioning financial assurance is required.

All operating power reactor licensees are required to have financial assurance, consistent with 10 CFR 50.75(c), and all licensees with an independent spent fuel storage installation regulated under 10 CFR Part 72 must have financial assurance for decommissioning in accordance with 10 CFR 72.30(c).

P. What Changes Are Being Made with Respect to Materials Facilities' Decommissioning Funding Plan (DFP) and DCE (DCE)?

This final rule requires certain licensees under 10 CFR Part 72 to adjust their DCE within 3 years of the previous DCE. This was done by final rule on October 3, 2003 (68 FR 57327) for licensees under 10 CFR Parts 30, 40, and 70. This provision in the final rule makes the timing basis for DCE adjustments consistent among all materials facilities.

Regarding DFPs, this final rule would make changes in § 30.35(e), § 40.36(d), § 70.25(e), and § 72.30(b) to require additional information from licensees. NRC's experience indicates that underestimation of decommissioning costs can occur when the licensee assumes it will qualify for a restricted site release by meeting all of the 10 CFR 20.1403 requirements. If it turns out that these requirements cannot be met, and that an unrestricted site release under 10 CFR 20.1402 will be required, the licensee may not have the ability to fund a potentially more expensive cleanup. For example, if instead of leaving large volumes of slightly contaminated soil onsite in a restricted release decommissioning, the licensee must ship this material offsite for disposal to support an unrestricted site release, the decommissioning will typically be much

more expensive due to high offsite disposal costs. Therefore, the final rule requires the licensee to estimate and cover the costs to decommission the facility to meet unrestricted use criteria. The option of meeting the 10 CFR 20.1403 restricted release requirements will be available, but the licensee would have to demonstrate that it can meet those criteria before a cost estimate based on that assumption would be acceptable.

In addition, certain operational events can increase decommissioning costs above the original estimate. These events include spills, increases in onsite waste inventory, increases in waste disposal costs, facility modifications, changes in authorized possession limits, actual remediation costs that exceed the initial cost estimate, onsite disposal, and use of settling ponds. The final rule amendments to 10 CFR 30.35(e)(2), 40.36(d)(2), 70.25(e)(2), and 72.30(b) require the 3 year update of the DFP to consider these events for the effect, if any, they may have on the estimated cost of decommissioning. Subsurface contamination can be very expensive to remediate. The new regulations require the licensee to estimate the volume of contaminated subsurface material that would require remediation, and provide financial assurance for the estimated cost of remediation. Early consideration and funding arrangements to cover increased costs will improve decommissioning planning and increase the likelihood that funds will be available when needed for site decommissioning.

Existing regulatory guidance identifies recommended methods for arriving at DCEs. The NRC is codifying some of these recommended methods in this final rule. To assure that funds will be adequate to complete decommissioning in the event the licensee is unable to do so, cost estimates are required to include contractor overhead and profit. An adequate contingency factor is necessary to cover unanticipated costs that can arise after the decommissioning project begins. The key assumptions underlying the cost estimate would have to be identified to aid the staff in evaluating the adequacy of the estimate. Codification of these recommendations will

improve the quality of DFP submittals, facilitate the staff's review of these submittals, and result in regulatory efficiencies.

NRC is aware of the records important for decommissioning reporting requirements licensees have under § 30.36(g)(1), § 40.36(f)(1), § 50.75(g)(1), § 70.25(g)(1), and § 72.30(d)(1). The additional reporting requirements in this final rule are designed to foster a better understanding of the impact the spill or contaminating event has on the DCE.

Q. What Changes Are Being Made with Respect to License Transfer Regulations for Materials Licensees?

This final rule makes a set of parallel changes to § 30.34(b)(2), § 40.46(a)(2), and § 70.36(a)(2). These changes codify NRC regulatory guidance to require the licensee to provide information on the proposed transferee's technical and financial qualifications, and to provide decommissioning financial assurance as a condition for approval of the transfer if the licensee is required to have financial assurance. The information and financial assurance are necessary to evaluate the adequacy of the proposed transferee. Placing these provisions in the regulation, rather than keeping them in regulatory guidance, will improve regulatory efficiency by improving the quality of license transfer requests. It also will ensure that a prospective license transferee provides to the NRC the information necessary to determine that public health and safety are not compromised by the transfer and that the radiation safety aspects of the program are not degraded.

R. What Changes Are Being Made with Respect to Permanently Shutdown Reactor Decommissioning Fund Status and Spent Fuel Management Plan Reporting?

The final rule amends § 50.82(a)(4)(i), and adds three new provisions to § 50.82(a)(8) in paragraphs (a)(8)(v) through (a)(8)(vii). The revised § 50.82(a)(4)(i) requires that the PSDAR

include, if applicable, a cost estimate for managing irradiated fuel, pursuant to § 50.54(bb). Before this final rule, the PSDAR was required to include a description of the planned decommissioning activities, a schedule for their accomplishment, and an estimate of expected costs.

The amendments to § 50.82(a)(8) require each power reactor licensee undergoing decommissioning to submit, in the form of an annual financial assurance status report, information (specified further in this section) regarding its decommissioning funds. Currently, under § 50.75(f)(1), the information reported to NRC by power reactor licensees is focused on collection of funds before permanent shutdown, and does not require information on the actual funds spent. To assess the adequacy of power reactor decommissioning funding after permanent shutdown, NRC needs to know the actual costs being incurred at decommissioned facilities. To obtain this information, the annual report is now required to include, among other things, the amount spent on decommissioning over the previous calendar year; the remaining balance of any decommissioning funds; and an estimate of the costs to complete decommissioning. If the annual report reveals a projected funding shortfall, additional financial assurance to cover the cost to complete decommissioning must be provided. These changes will improve NRC oversight of decommissioning planning and increase the likelihood that funds for decommissioning will be available when needed.

Under new § 50.82(a)(8)(vii), the annual financial assurance status report must also include the status of funds to manage irradiated fuel. Due to the cessation of operating revenues, spent fuel management and related funding are a concern after the reactor is permanently shut down. Therefore, the final rule requires that the amount of funds accumulated to cover the cost of managing the spent fuel be specified; that an estimate of the projected costs of spent fuel management, until the Department of Energy takes title to the spent fuel, be provided; and that a plan to obtain additional funds if the accumulated funds do not cover the

projected cost be identified. These changes will increase the likelihood that funds for spent fuel management will be available when needed.

S. When Do These Actions Become Effective?

The effective date of the Decommissioning Planning final rule is one-year after publication of the final rule in the *Federal Register*. The NRC considers this an adequate amount of time for licensees to implement the requirements in the final rule. The 1 year period will provide licensees sufficient time if there is a need on their part to review their current methods for radiological surveys and monitoring in relation to new 10 CFR 20.1406(c) and modified 10 CFR 20.1501(a) and (b). Also, the one-year implementation period will accommodate the time needed to prepare and publish a final version of draft Regulatory Guide DG-4014, "Radiological Surveys and Monitoring During Operations," which is planned for release for public comment around the date when the Decommissioning Planning final rule is published. DG-4014 contains changes made as a result of public comments received on the draft guidance released with the Decommissioning Planning proposed rule. The NRC considered revising Regulatory Guide 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," dated June 2008, but considered this inappropriate because Regulatory Guide 4.21 applies only to certain licensees who submitted their initial license application after August 20, 1997. DG-4014 applies to licensees who submitted their initial license application on or before August 20, 1997, and who were not required to consider in the early planning stages of the facility specific design features for contaminant management. Additionally, the one-year implementation period will provide sufficient time to licensees who need to (a) switch out of their escrow account into a different financial assurance mechanism; (b) examine their continued use of a parent guarantee or self-guarantee as decommissioning financial assurance; or (c) prepare more detailed information in their DCE or surety supporting their DFP. Power reactor licensees who are in a

shutdown status will need to submit a report on the status of funding for managing irradiated fuel by March 31, 2010.

T. Has NRC Prepared a Cost-Benefit Analysis of the Final Rule?

Yes, the NRC staff prepared a draft regulatory analysis for the proposed rule. Public comments were received on the draft regulatory analysis and are discussed in Section III.D of this rule. The regulatory analysis was revised for this final rule. Single copies of the regulatory analysis are available as discussed in Section X of this rule.

The implementation of the final rule by industry, NRC and Agreement States was analyzed to cost about $44 million (2007$) over a 15 year analysis period at 3 percent discount rate. NRC licensee costs are about $6 million, and NRC costs are about $3 million. Agreement State licensee costs are about $22 million, and Agreement State costs are about $12 million. Two alternatives were considered, each with estimated total costs that were higher than implementation of this final rule. The primary benefits of the final rule are due to reduction in the number of legacy sites and higher reliability of obtaining sufficient funds pledged for decommissioning financial assurance to complete the decommissioning work through license termination.

The Backfit Analysis is included in the regulatory analysis, and also is discussed in Sections III.F and XII of this final rule.

U. Has NRC Evaluated the Additional Paperwork Burden to Licensees?

This final rule contains new or amended information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq). NRC staff has estimated the impact this final rule will have on reporting and recordkeeping requirements of

NRC and Agreement State licensees. More information on this subject is in sections III.J and IX of this final rule.

III. Summary and Analysis of Public Comments on the Proposed Rule

The proposed rule on Decommissioning Planning was published on January 22, 2008 [73 FR 3812], for a 75-day public comment period. The NEI and several other stakeholders requested an extension of 90 days to provide review of issues raised in the proposed rule. The NRC extended the comment period by 30 days, until May 8, 2008 [73 FR 14946]. The NRC received 35 comment letters on the proposed rule. The overall commenter mix on the proposed rule included states, licensees, industry organizations, environmental advocacy organizations, and one individual.

The comments and responses have been grouped into 11 areas. NRC specifically sought comments on the first five areas: (1) the use of fee incentives to induce licensees to characterize subsurface residual radioactivity while their facility is operating; (2) licensees' use of a secure website to submit and update decommissioning reporting and financial assurance requirements; (3) the extent of proprietary data in the details submitted under new requirements in 10 CFR 50.82(a)(4)(i) and 50.82(a)(8)(v); (4) the accuracy of input assumptions and methodology in the regulatory analysis and environmental assessment; and (5) information regarding significant amounts of radium-226 at sites that could be considered legacy sites in the regulatory analysis. The other comment areas are (6) backfit considerations; (7) need for 10 CFR 20.1403, 20.1406 and 20.1501 amendments; (8) financial assurance mechanisms and reporting; (9) draft regulatory guidance, (10) OMB Supporting Statement; and (11) Agreement State compatibility table. To the extent possible, all of the comments on a particular subject are grouped together. A discussion of the comments and the NRC staff's responses follow.

A. Fee incentives

In the proposed rule, NRC specifically invited comment on whether fee incentives, as permitted in 10 CFR 171.11(b), would be effective as a means to induce licensees to perform site characterization work during operations instead of waiting until the facility is shut down.

Six commenters responded to this topic and all argued against the adoption of fee incentives. Some said the concept had not been clearly explained. Several commenters argued that any incentive should not reduce financial assurance amounts. Some thought that incentives would have the effect of transferring the financial burden of meeting the proposed requirements from licensees who have subsurface residual radioactivity to those who do not. Monitoring of environmental impacts during operations, one said, is an essential part of doing business that should not require incentives. Three commenters thought the exemption of annual fees as a "fee incentive" to conduct monitoring during facility operations would be contrary to Congress' requirement that NRC collect user fees and would not fit into the narrow range of exemptions contemplated in 10 CFR §171.11. One commenter said that the NRC should not give a blanket exemption to all power reactor licensees under Part 171 by characterizing it as a "fee incentive" for complying with a proposed regulation or a volunteer monitoring program.

Response: The Commission agrees with the commenters that no fee incentives should be provided as part of this final rule. For any subsurface monitoring and modeling activities that may be required as a result of this final rule, licensees should fund such activities as an operating and maintenance expense to help achieve occupational and public doses that are ALARA.

B. Secure website

The NRC specifically invited comment on the use of a secure website for use by licensees to submit and update decommissioning reporting requirements, and information submitted to support passing the financial tests in the parent guarantee and self-guarantee. NRC received input on this issue from two states and the Conference of Radiation Control Program Directors, Inc. (CRCPD). The commenters were not clear on the implementation of the website because this topic was not discussed in the proposed rule. One commenter supported the concept of using a website, but questioned whether states would have access to the information, whether notifications would be sent electronically when information was updated, and whether the website would be a data transfer tool or would also contain algorithms for decision logic. One of the state commenters supported the concept only if the information would be publicly available.

Response: Public comments were solicited on this topic to provide initial information regarding the scope of functions for a website to allow materials licensees to submit, revise and update information in their DFP, DCEs, information in the financial tests for the parent company guarantee and self-guarantees, and decommissioning power reactor annual financial assurance status reports. For the licensees whose companies are publicly traded, there appears to be no sensitive or proprietary data in the financial information reported to support use of the parent guarantee and the self-guarantee, as much of this information can be obtained in the public domain. Licensees may request that information submitted to the NRC be withheld from public disclosure in accordance with 10 CFR 2.390(b). The NRC thanks commenters for responding to this question and will factor their comments into any plans to modernize the processing of this information. Currently, there are no plans to develop such a website.

C. Proprietary data

NRC specifically invited comment on whether additional details in new reporting requirements of licensees with a power reactor in a shut down status would be considered proprietary to the licensees reporting the information. These new reporting requirements are in 10 CFR 50.82(a)(4)(i) and 50.82(a)(8)(v). One commenter responded to this question, stating that the more information available for public review the better will be the analysis for decommissioning planning with respect to work scope and cost.

Response: The NRC staff agrees with this comment. The information required by the new reporting requirements can be conveyed by licensees in their PSDAR and in their annual financial assurance status report, at little additional burden. The PSDAR information is publicly available. The annual financial assurance status report information submitted to the NRC under revised 10 CFR 50.82(a)(8)(v) and (8)(vii) will be publicly available unless the licensee submitting the information shows that the information should be withheld from public disclosure in accordance with the regulations in 10 CFR 2.390(b).

D. Regulatory analysis and the environmental assessment

The NRC specifically invited comment on the input assumptions, methodology and results in the draft regulatory analysis, including the Backfit Analysis, and the environmental assessment. Comments were received and are discussed below. Comments on the Backfit Analysis are discussed in Section III.F of this preamble to the final rule.

Comment D.1: The need to install new capital or modify procedures is not expected.

Several commenters objected to the statement made by NRC, in the Executive Summary and again in Section 2 of the regulatory analysis, that “It is not expected that (power reactor and uranium fuel fabrication) licensees will need to install new capital or modify existing operating procedures to satisfy the proposed amendments to 10 CFR 20.1406(c) and 20.1501.”

The commenters interpreted the statement to mean those licensees would never need to install new equipment or modify procedures to comply with the new requirements.

Response: The previous statement was made in the context of anticipated changes that licensees would need to make by the effective date of the final rule, given information about onsite leaks and spills known to the NRC at the time the proposed rule was published. Licensees must be allowed time to perform scoping surveys and preliminary characterization of site contamination to determine if their site contains significant residual radioactivity. Based on the evaluation of these surveys, additional monitoring and modeling may be required based on site specific conditions. Page 41 of the draft regulatory analysis released with the proposed rule states this position by NRC, where it says that "It may be necessary for licensees at a time after the effective date of the final rule to install additional monitoring equipment under some circumstances…The need for additional monitoring equipment would be determined on a case-by-case basis by either licensee activities or after NRC inspection activities."

Comment D.2: Costs to uranium recovery licensees.

Several commenters stated that the regulatory analysis did not properly analyze the costs to retrofit and upgrade uranium recovery facilities.

Response: As discussed in the response to Comment G.14, the NRC has concluded that a uranium recovery licensee's program that complies with the 10 CFR Part 40, Appendix A site remediation criteria would not be impacted by § 20.1501(a)'s revised survey requirements, and such programs would not become more complex or expensive as a result of this rulemaking. Thus, survey and monitoring costs at uranium recovery facilities are not expected to change, and there is no need to revise the regulatory analysis in this regard.

Comment D.3: Part 20 changes could affect hundreds and costs are underestimated.

Several commenters argued that the proposed changes to 10 CFR Part 20 and draft guidance for survey and monitoring could affect hundreds of licensees, and that the costs of the

regulation were underestimated both for materials licensees and for power reactor licensees. One commenter stated that the NRC has grossly underestimated the cost to licensees of achieving compliance. One commenter believes the proposed regulations and draft guidance documents appear to leave no options other than installation of a complicated subsurface monitoring system to prove that a subsurface monitoring system is not needed. The commenter stated that industry experience shows that these monitoring systems can cost from $500,000 to well over $1,000,000. Another commenter argued that the scope of the proposed rule and guidance is far more extensive than warranted by the circumstances and is inconsistent with the NRC's own finding that none of the instances of inadvertent releases to the environment presented a threat to public health and safety.

Response: Section II.B of this preamble discusses why very few licensees will be affected by the changes being made to new 10 CFR 20.1406(c) and amended 20.1501. For those licensees who are affected by the change in Part 20 regulations, the revisions made to their existing monitoring methods will be site-specific and may not require the installation of a subsurface monitoring system. For example, if a site contains significant residual radioactivity in the soil, the monitoring plan likely will require only the specification of sampling locations and sampling methodology. If the significant residual radioactivity in the soil has migrated to a ground water pathway, then a ground water monitoring plan will be required that is appropriate for the affected site. As stated in the preamble to the proposed rule [73 FR 3821 c. 2], the licensees of power reactors and fuel cycle facilities already perform surveys to detect radioactive release to the ground water, or will be performing ground water surveys by the effective date of this final rule. It is likely that these surveys will contain sufficient information to satisfy the final rule requirements in new 10 CFR 20.1406(c) and amended 20.1501.

The NRC revised the regulatory analysis for this final rule to include a one-time cost for 500 NRC licensees and 1000 Agreement State licensees to read the final rule changes in new

10 CFR 20.1406(c) and amended 20.1501 and draft Regulatory Guide DG-4014, and to determine if the licensees are affected by the final rule. NRC assumed these licensees would need 90 minutes each to read the changes to 10 CFR Part 20 and DG-4014. This increased the cost estimate in the regulatory analysis by $270,000 for the preferred alternative but did not affect the decision rationale that implementation of the final rule is preferred compared to the other two alternatives.

Comment D.4: Impact of requirements on existing facilities.

One commenter stated that the proposed rule could significantly affect the existing design of systems, monitoring, surveys, site characterization, and recordkeeping that are performed to meet existing regulations. The proposed rules also could ultimately affect the site release alternatives available at decommissioning. A commenter argued that for some licensees, such as research and test reactors, the consequence would be to severely limit or entirely eliminate the ability of these facilities to perform their mission of research and education. Another commenter disagreed with the NRC staff's conclusion that currently operating power reactor licensees' voluntary adherence to the NEI GPI is sufficient to comply with the proposed amendments to 10 CFR 20.1406 and 20.1501. One commenter representing several States disagreed with the NRC's statement that survey and monitoring activities are already taking place, finding it unlikely that ground water or subsurface surveys have been an integral part of the past radiation monitoring programs at facilities. The commenter also disagreed that adequate current information exists on the spatial bounds and concentrations of residual radioactivity at sites to enable decisions to be made about which sites will require remediation.

Response: For the reasons discussed in the response to comment D.3, and in this preamble's Section II.B, the NRC believes that very few licensees will be affected by changes to new 10 CFR 20.1406(c) and amended 20.1501 by the effective date of the final rule. After the effective date, as modeled in the regulatory analysis, the NRC believes licensees of a small

number of materials facilities will need to perform additional monitoring compared to their current practices because of significant residual radioactivity at the site. With respect to information collected by power reactor licensees as part of the NEI GPI, the NRC will begin to inspect the activities performed by power reactor licensees compared to their public commitments in the GPI. NRC Temporary Instruction 2515/173 (ADAMS ML072950622) will be used by inspectors to assess if licensees have completed the voluntary industry GPI. The Temporary Instruction includes inspection of licensees' Annual Reporting whereby the power reactor licensees will have documented onsite ground water sample results for each calendar year in the Annual Radiological Environmental Operating Report (AREOR) or the Annual Radiological Effluent Release Report (ARERR), as part of their annual environmental and effluent reports. This information is publicly available in ADAMS. The NRC agrees with the commenter representing several States that ground water or subsurface surveys are not expected to be performed at materials licensees as an integral part of their current radiation monitoring programs if there is no evidence at the site of significant subsurface residual radioactivity. The 10 CFR Part 20 changes in this final rule are aimed to improve licensee understanding of spatial bounds and concentrations of significant residual radioactivity at sites during active facility operations.

Comment D.5: Analysis of Voluntary Industry Actions

One commenter, supported by two other commenters, stated that the NRC did not properly assess the impact of the rule against current regulatory requirements. In an apparent reference to the GPI, the commenter stated that the proposed rule was being improperly analyzed against a more stringent set of voluntary licensee actions. This approach is said to have policy implications in that it could have a chilling effect on licensees' willingness in the future to undertake voluntary initiatives.

Response: The NRC disagrees with this comment. The NRC staff evaluated the GPI consistent with the 2004 guidance in NUREG/BR-0058, Revision 4 ("Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission"). Section 4.3.1 of NUREG/BR-0058 describes an acceptable method to analyze voluntary industry initiatives in estimating values and impacts. Values are benefits, and impacts are costs. A 1999 staff requirements memorandum (approving SECY-99-178, "Treatment of Voluntary Initiatives in Regulatory Analyses") had directed the NRC staff to ensure that NUREG/BR-0058 was revised to facilitate consistent and predictable treatment of voluntary initiatives in regulatory analyses. In accordance with NUREG/BR-0058, the Regulatory Analysis, in estimating values and impacts of the GPI, considered two cases: giving "no credit" for the voluntary GPI, and giving "full credit" for the voluntary GPI.

In the Regulatory Analysis, a "Baseline" of No-Action was modeled as Alternative 1. Alternative 2 was modeled as the preferred Alternative, consistent with the amendments in this rulemaking. Alternative 3 was the same as Alternative 2, but added a security interest in collateral for licensees who use a parent guarantee or a self guarantee. Table 5-1 in the Regulatory Analysis itemized the net impacts of Alternatives 1, 2, and 3. The net impact over a 15-year analysis period of Alternative 2 was $70 million less than Alternative 1, and the net impact of Alternative 2 was $260 million less than Alternative 3. These results provided "no credit" for the voluntary activities performed by power reactor licensees under the GPI.

Section 6 of the Regulatory Analysis provided a description of the GPI, with Section 6.1 on page 42 identifying the incremental impact of the voluntary GPI based on cost assumptions in Appendix D of the Regulatory Analysis. No comments were received during the proposed rule public comment period regarding NRC's cost estimates of the GPI. The NRC estimated the costs of Part 50 licensees to implement the GPI over the 15-year analysis period to be about $105 million (2007$) at 3 percent discount rate. "No credit" was given for these activities

because these costs are incurred regardless of the eventual promulgation of this final rule. The GPI has different objectives than the amendments in this final rule, and the voluntary activities by power reactor licensees were undertaken before development of this rulemaking.

If instead "full credit" was given for the expected costs under the GPI, the results for Alternative 2 would not change because no additional survey and monitoring activities were modeled in any of the Alternatives for power reactors who are implementing the voluntary GPI. Based upon the NRC's review of power reactor licensee reports and information known to the NRC about current conditions at power reactor sites, the NRC does not believe that any current power reactor licensee has contamination at its site which exceeds the threshold in the final rule that would require additional monitoring. Therefore, the Regulatory Analysis did not identify any additional costs or benefits associated with the final rule's survey and monitoring requirements as applied to current power reactor licensees. Following promulgation of this final rule, there may be an increase in survey and monitoring activities at some power reactors, and a decrease in activities at other power reactors. The results for Alternative 2 in the Regulatory Analysis show that early detection of significant subsurface contamination through surveys and monitoring, and appropriate response by the licensee, is the preferred approach when the regulatory objective is to ensure the licensee and the NRC are aware of contamination that may create conditions that would complicate decommissioning, and possibly create a legacy site.

The NRC does not agree with the commenter that a "chilling effect" on future voluntary industry initiatives will occur if the NRC adopts the final survey requirements by rule. As discussed in the Regulatory Analysis, the GPI was initiated by power reactor licensees independent of this rulemaking. The industry operates in an environment where there are many factors other than the possibility of NRC rulemaking that may influence the industry's decision to voluntarily undertake action. The NRC does not believe it is reasonable to assume that a rulemaking which overlaps an area of voluntary industry action will inhibit future voluntary

industry initiatives. Moreover, the NRC believes that any possible disincentive to industry to undertake such voluntary actions is removed by NRC performing a Regulatory Analysis using two different baselines to account for the industry's voluntary actions, consistent with the guidance in NUREG/BR-0058.

Comment D.6: Cost of characterization.

Several commenters stated that the cost would be large to perform site characterization, if required under the proposed rule in 10 CFR 20.1501(a). According to one cost estimate prepared for a Part 40 facility, setting up the initial near-surface soil characterization and installing the necessary monitoring equipment would cost between $30,000 and $50,000 for a site with a relatively small footprint. This cost would include obtaining the necessary samples and conducting the associated laboratory work. Additionally, requiring maintenance and ongoing monitoring would result in annual expenditures of approximately $10,000/year. One commenter believed NRC's estimate of the cost was too low, and therefore that its cost-benefit analysis was flawed.

Response: The NRC's estimates of one-time monitoring equipment and annual maintenance costs were almost identical to those cited previously by the commenter. On page 54 of the regulatory analysis released with the proposed rule, the one time capital cost for a ground-water monitoring system was estimated at $46,000, and the annual cost for inspection, leak detection and ground-water monitoring was estimated at $9,500/year, for the few facilities that were analyzed to need such monitoring. The actual scope of work that will be performed by licensees as a result of amended 10 CFR 20.1501(a) in this final rule covers a broad range of activities, with a broad range of expected costs.

Comment D.7: Regulatory analysis examples cannot be generalized to broad classes of licensees.

One commenter believes that the examples in the regulatory analysis relate to unusual factual and financial circumstances which cannot be generalized to broad classes of NRC licensees.

Response: The Commission disagrees with this statement. The legacy sites modeled in the regulatory analysis were assumed to be rare earth extraction facilities holding contaminated material in areas of 200 square meters at 0.6 meters depth. This is viewed as being an acceptably conservative representation of a legacy site for purposes of performing the regulatory analysis. Without effective regulation, the technical and financial conditions that contributed to the creation of legacy sites in the past could occur in the future at sites that are licensed under 10 CFR Parts 30, 40, 50, 70, and 72, especially those with radioactive material possession limits high enough to require decommissioning financial assurance.

Comment D.8 Environmental assessment.

One comment received on the environmental assessment agreed that monitoring wells, if required at licensed sites, will result in small environmental impacts. Another commenter, a state, disagreed strongly with the finding in the proposed rule of no significant environmental impact and stated that such a finding violates the National Environmental Policy Act (NEPA). The commenter believes the NRC must perform additional environmental analyses because the final rule does not go far enough in requiring prompt remediation of spills and leaks during facility operations, and that during any cleanup delays contamination could spread, resulting in larger impacts on environmental resources, nearby properties, and public health.

Response: The NRC agrees that the procedures necessary to detect and monitor subsurface contamination will not have a significant environmental impact. The initial licensee investigation may involve only the review of records of past leaks and spills (if any) and facility inspections to identify potential release points. Physical sampling, if any, will take place within the boundaries of the site and will involve small amounts of drilling and analysis. The wastes

generated from sampling and from laboratory analysis of the samples will be managed according to existing environmental requirements that have been designed to avoid impacts on the environment. The environmental impacts of remediation, if it occurs, have already been reviewed in connection with the LTR [62 FR 39057; July 21, 1997]. In that final rule, a generic Environmental Impact Statement evaluated "the environmental impacts associated with the remediation of several types of NRC-licensed facilities to a range of residual radioactivity levels" [62 FR 39086].

The NRC does not agree that absent immediate remediation of all subsurface contamination there will be a significant impact on the environment; nor does NRC agree that the environmental assessment's finding of no significant impact is incorrect. This final rule allows a licensee who detects subsurface contamination either to conduct immediate remediation or to plan for and provide funds in the form of financial assurance to conduct remediation at a later time, including at the time of decommissioning. Thus, this final rule creates a potential incentive for immediate remediation instead of an increased financial assurance obligation. Whenever the remediation occurs, however, the licensee is required to ensure that at the time of decommissioning the annual 25 millirem license termination standard will be met. This final rule does not change or weaken that requirement.

E. Radium-226

The NRC invited comments regarding the description of sites that are known to have significant amounts of radium-226 contamination from past practices or operations, and whether the information of these sites could be included as legacy sites in the regulatory analysis. Two comments were received on this topic. One comment, from a state, provided limited information on the remediation of radium contamination at two structures in the state. This commenter also noted the difference between discrete radium sources that are considered byproduct material

and diffuse radium sources which are not regulated by the NRC. A second comment, from an organization representing states, noted that legacy sites exist where discrete radium was manufactured and that these types of sites should be included in the regulatory analysis, but no specific information was provided for use in the regulatory analysis.

Response: The NRC appreciates the comments from states with qualitative information about radium-226 contaminated sites. No changes were made in the quantitative results of the regulatory analysis to include costs and benefits from radium sites, but the analysis was revised with the qualitative descriptions from these commenters.

F. Backfit considerations

Comment F.1: Proposed rule and guidance will have substantial impacts on facilities and procedures.

Comment F.1: One commenter (NEI) stated that the proposed rule, coupled with the survey and monitoring draft guidance, will have substantial impacts on licensees' facilities and procedures (e.g., new confinement measures; leak detection equipment; three-dimensional modeling of ground water contamination) and would require the preparation of a Backfit Analysis. The commenter stated the proposed rule would codify in the regulations for power reactor licensees the actions which such licensees have voluntarily agreed to perform under the GPI. The commenter further stated that the new 10 CFR 20.1406(c) and amended 10 CFR 20.1501(a) and (b) are not a "clarification" of existing requirements, but rather an effort to impose an expansive regulatory scheme of "ongoing decommissioning," where activities that would normally take place at the time of decommissioning would have to occur instead during plant or facility operation. The commenter also stated that NRC has made no demonstration that there is a substantial increase in the protection of the public health and safety, or that the

proposed rule is justified to achieve compliance or ensure adequate protection of the public health and safety, or that a redefinition of the level of protection is necessary.

Response: While the commenter is correct that the findings referenced were not made, these findings are not required here because the preparation of a backfit analysis of this rulemaking is not required, as discussed further in this section.

The NRC disagrees that the new 10 CFR 20.1406(c) and amended 10 CFR 20.1501(a) and (b) will have substantial impacts on facilities and procedures. As stated in the preamble of the proposed rule, these proposed requirements "specify that compliance with 10 CFR Part 20 requirements is a necessary part of effectively planning for decommissioning," and that any actions undertaken by licensees during facility operations to comply with these new requirements would only "provide a technical basis for licensees and the NRC to understand the effects of significant residual radioactivity on decommissioning costs, and to determine whether existing financial assurance provided for site specific decommissioning is adequate" [73FR 3814 c. 3]. The term "residual radioactivity" includes radioactivity in soils and ground water, which should already be the focus of licensee survey and monitoring efforts, and minimization efforts, to prevent the subsurface accumulation of radioactive material that could be a potential radiological hazard.

Whether significant residual radioactivity exists at a given site is a complex site-specific issue, and the NRC received no information during the proposed rule public comment period that any site now has residual radioactivity at levels that would exceed the 10 CFR 20.1402 dose criteria at the time of facility decommissioning. For operating facilities, significant residual radioactivity is a quantity of radioactive material that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402 [73 FR 3835 c. 1]. For example, the sample data from isopleths of subsurface contamination at Indian Point Energy Center (submitted by the State of New York, in Exhibit A of its comment) does not show

that significant levels of residual radioactivity are present there [2008 Indian Point Government to Government Meeting, May 9, 2008].

The commenter is correct that NRC will expect licensees to apply radiological screening values, or other methods recommended in guidance, to determine if residual radioactivity at the site has accumulated or is in ground water at levels that are considered significant. But to the extent that the commenter is relying on the survey and monitoring draft guidance to support its backfit argument, such reliance is misplaced. Guidance documents do not impose regulatory requirements.

Moreover, it has never been a policy of the NRC that significant subsurface contamination may go unmonitored, or that appropriate survey information not be obtained regarding such contamination, just because the contamination does not pose an immediate safety or health hazard. The licensee must have such information to achieve doses that are ALARA during the life cycle of the facility, including during decommissioning. Licensee procedures to comply with the ALARA requirement in 10 CFR 20.1101(b) should be in place at facilities where there is a reasonable risk that such contamination may occur.

Regarding the issue of "ongoing decommissioning," the NRC disagrees that the regulations for this final rule contain such a requirement. Licensees are not required through this final rule to perform any new type of extensive characterization or timely remediation during facility operations. Instead, in draft Regulatory Guide DG-4014, the NRC has specified for licensees (1) an acceptable method to determine if any changes are needed to existing site monitoring practices, and (2) acceptable approaches to determine the cost-effectiveness of prompt, compared to deferred, cleanup of contamination based on sample analysis. The scope of cleanup activities during facility operations is dependent on site specific conditions. This final rule does not require that any new remediation action be undertaken by a licensee during operations. Remediation of residual radioactivity at the site may occur during decommissioning,

or it may occur during facility operations if the licensee deems it beneficial to perform sooner rather than later. If the decision is to remediate later, then a materials licensee must consider the extent of contamination in its updated DFP.

The final rule does not codify the actions that power reactor licensees are performing voluntarily under the GPI. New 10 CFR 20.1406(c) requires power reactor licensees to conduct their operations, to the extent practical, to minimize the introduction of residual radioactivity into the site, including the subsurface. The GPI does not specify licensee activities to minimize contamination at the site. Revised 10 CFR 20.1501(a) specifies that survey and monitoring requirements must be performed of residual radioactivity in areas, including the subsurface, that are potential radiological hazards. This final rule identifies significant residual radioactivity at the site as a potential radiological hazard. This specification of survey and monitoring requirements is not part of the GPI.

Comment F.2: Immediate remediation.

Three commenters argued that immediate remediation should be required after contamination is discovered. One commenter stated that requiring licensees to immediately remediate the contamination resulting from any unplanned or unauthorized release would protect the environment and the public and reduce the likelihood that the NRC and the federal taxpayers would be saddled with the responsibility of decontaminating a spreading plume of radionuclides at legacy sites several years down the road. Another commenter urged the NRC to include rules related to the establishment of reclamation milestones. The commenter stated that the NRC in the past has allowed at least one licensee to defer the cleanup of off site tailings until the final reclamation, even though it was perfectly feasible for the off-site contamination to be cleaned up and placed on the tailings impoundment. The result was that the cost from extensive off site tailings cleanup was not born by the licensee.

Response: The issue of whether immediate remediation should be required after contamination is discovered is outside the scope of this rulemaking. The focus of this rulemaking is on improving the decommissioning planning process. This rule does not suggest that immediate remediation is being imposed as a new requirement.

Slow, long-term leaks, particularly those that cause subsurface soil and ground-water contamination, can significantly increase the cost of decommissioning [73 FR 3814 c. 3]. Such leaks may eventually produce radiological hazards [73 FR 3820 c. 2]. To adequately assure that a decommissioning fund will cover the costs of decommissioning, one must have a reasonably accurate estimate of the extent to which residual radioactivity is present in the subsurface soil and ground water. Together, the proposed requirements in 10 CFR 20.1406(c) and 20.1501(a) specify that compliance with 10 CFR part 20 requirements is a necessary part of effectively planning for decommissioning [73 FR 3814 c. 3]. These regulatory changes are consistent with existing requirements for operating facilities contained in 10 CFR 20.1101(b), requiring licensees to use procedures and engineering controls to achieve doses to members of the public that are ALARA, both during operations and during decommissioning. To accomplish this, licensees must be able to demonstrate their knowledge of residual radioactivity in the subsurface, including soil and ground-water contamination, particularly if the subsurface contamination is a significant amount that would require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402. [73 FR 3815 c. 2] While leaks from facilities can lead to a large volume of radioactive contamination entering the subsurface environment over an extended time, this does not necessarily mean that estimated doses from this contamination are above the limits in 10 CFR part 20 that would initiate immediate regulatory action [73 FR 3820 col. 3].

Moreover, even if the comment pertained to issues within the scope of this rulemaking, this final rule does not impose immediate remediation as a regulatory requirement. NRC's

performance-based regulatory framework provides licensees a measure of flexibility to determine for themselves the appropriate response to a contaminating radiological event that does not exceed a regulatory threshold and does not result in a health or safety concern. By providing this discretion to licensees instead of a prescriptive approach, the NRC is encouraging licensees to focus on results and to implement methods that are effective for them and will result in improved outcomes. The types of contaminating events that are the focus of this final rule are not an immediate radiological hazard, but over time these can accumulate in an inaccessible area or migrate to ground water pathways to form significant residual radioactivity at the time of decommissioning. Licensees are not now required to perform immediate remediation of low-level contaminating events that do not exceed regulatory thresholds, and licensees are not required through this final rule to perform any new type of immediate remediation. If the licensee is aware of significant subsurface contamination through surveys and decides to defer cleanup of that contamination to some future date, then the NRC must ensure that adequate funds are available at time of decommissioning to complete the work. During facility operations, it is the responsibility of NRC staff to ensure that licensees have adequate decommissioning financial assurance based on specific regulatory requirements, including in many cases site specific DCEs. At the start of and during facility decommissioning, the NRC staff is responsible for ensuring that the DCE is based on reasonable project milestones to complete the activities within a timely schedule, to monitor the progress of the licensee against the milestones, and to require additional decommissioning financial assurance if the schedule is extended.

Comment F.3: The expanded scope of new 10 CFR 20.1406(c).

Regarding the expanded scope of 10 CFR 20.1406 to include existing licensees, several commenters argued that this expansion: (1) had not been adequately analyzed for its impact; (2) was inconsistent with the NRC's own finding in the Liquid Radioactive Release Lessons

Learned Task Force Final Report (ADAMS ML062650312) that the releases were not a threat to public health and safety; and (3) should be evaluated as a backfit.

Response: The expanded scope of 10 CFR 20.1406 was evaluated in the regulatory analysis for the proposed rule. Based on the technical basis in section 2 of the regulatory analysis, five operating sites with licensed rare earth extraction activities were modeled to have residual radioactivity at a level that would exceed the unrestricted release criteria of 10 CFR 20.1402, at the time of their decommissioning. The one-time costs and annual costs for these licensees were modeled over a 15 year analysis period, including ground water monitoring, and licensee inspection and leak detection activities at each facility (regulatory analysis, December 2007, p. 34). The comments offer no specific criticisms of this analysis, and thus do not call into question the validity of its findings.

The regulatory analysis for the proposed rule and final rule included discussion of the findings of the Liquid Radioactive Release Lessons Learned Task Force Final Report. The regulatory analysis summarizes the report as having "identified a large volume of subsurface and ground-water tritium contamination from power reactors due to undetected leaks in spent fuel pools, component cooling water tanks, condensate holding tanks, refueling water storage tanks, borated water storage tanks, buried piping, and ventilation systems," as well as having "identified other radionuclides, including mixed fission products, cobalt-60, cesium-137, and strontium-90, that were inadvertently released into the onsite environment at two power plants" [regulatory analysis, page 7]. The NRC agrees that one of the conclusions of the Liquid Releases Lessons Learned Task Force Final Report was that the report did not identify any instances of liquid radioactive release where the health of the public was impacted. However, none of the sites examined in the report are legacy sites. Based on NRC experience, chronic radioactive release to the subsurface is a primary contributing cause to the creation of a legacy site, and a legacy site is a potential radiological hazard that may be a threat to public health and

safety. The final rule does not require evaluation of a backfit analysis because the new or amended regulations in the rule either clarify existing requirements or require the collection and reporting of information using existing equipment and procedures. As such, the new or amended regulations are not regulatory actions that require the performance of a backfit analysis.

Comment F.4: Agreement that a backfit analysis is not required.

One commenter agreed with the position taken by the NRC that a backfit analysis is not required for this proposed rule because the requirement already exists for licensees to perform waste characterization and minimization during operations.

Response: The NRC agrees that a backfit analysis is not required for this proposed rule. But the NRC cannot respond further to the comment, as it provides no citations to regulatory requirements referenced in the comment.

G. Need for 10 CFR 20.1403, 20.1406, and 20.1501 Amendments

Comment G.1: Support for amended 10 CFR 20.1403.

Commenters from several States expressed support for the proposed criteria in §20.1403 for license termination under restricted conditions eliminating certain financial assurance methods. They noted that since September 11, 2001, it has become more difficult for materials licensees to get any form of surety, and that the NRC should be sensitive to this situation, but also agreed that certain financial assurance methods may not be effective in bankruptcy situations.

Response. The NRC agrees that a trust fund is the financial assurance mechanism most suitable for use over the relatively long period required for license termination under restricted conditions. The trust fund should be a less complicated financial instrument to

establish and fund decommissioning financial assurance compared to other forms of surety which can be difficult for materials facilities to maintain over long periods.

Comment G.2: Support for amended 10 CFR 20.1406 and 20.1501.

Several commenters supported the new Part 20 regulations, arguing that residual radioactivity is a problem that should be addressed promptly. One commenter stated that as time passes, residual radioactivity can spread vertically and laterally driven by downward percolating rainfall and snow melt increasing the volume of materials requiring excavation. This commenter concluded that licensees should be compelled to conduct thorough subsurface investigations of their sites that include drilling and should residual radioactivity be found should be compelled to remediate or otherwise address it promptly. Commenters from several States also support the proposed requirements. One commenter stated that a lack of characterization of subsurface residual radioactivity could lead to a need for additional unforeseen decommissioning activities, and that the cost of removing and disposing of residual radioactivity could overwhelm existing decommissioning funds and lead to the site becoming a legacy site. Subsurface investigations should take place where it is known that residual radioactivity exists so that mitigating efforts can be put in place before the situation worsens and revisions to the decommissioning funding calculations, if necessary, can be made. The cost to enforce and fully decommission a single legacy site is much higher than the cost to prevent the occurrence of a legacy site through amended regulations. A commenter representing several States generally supported the proposed §20.1501 requirements, noting that slow and long-lasting leaks, and leaks from the processing of large quantities of licensed material, especially in liquid form, did pose particular risks. Another commenter asserted that events in the last decade have shown that the key assumptions behind the 1988 and 1998 decommissioning regulations are no longer accurate, and that the NRC has become aware of several unpermitted releases at sites across the country.

Response: The Commission agrees that licensees must have, at a minimum, adequate information about the type and extent of significant residual radioactivity that is present in the subsurface at their facility. The licensees can then make informed decisions about whether to undertake remediation immediately or to plan for remediation at the time of decommissioning, while revising their DCE and decommissioning financial assurance to ensure that they will be able to address effectively the cleanup of the subsurface contamination.

Comment G.3: Support for monitoring and recordkeeping requirements.

One commenter stated that when any subsurface contamination above background is identified, it should be noted in decommissioning records, even if it is not otherwise reportable. This is because such information can be very useful for conducting site characterization for purposes of license termination and to support decisions on the extent of site remediation necessary to meet unrestricted use criteria. It is also useful when planning modifications to a facility. This stems from the logic that if subsurface contamination exists, it came from some plant system that handles that material, so any physical activity on or near those systems should include provisions for dealing with the source of contamination. One state commenter provided a detailed description of a situation it had encountered that supported the need for increased monitoring. It stated further that recording recurring leaks or spills in decommissioning records or operational logs is neither onerous nor financially burdensome. Geographic Information Systems (GIS) make documentation of tracking of spills a relatively easy task, and do not pose a paperwork burden. Tracking of these data are critical for an effective Historical Site Assessment under MARSSIM.

Response: The NRC agrees with these comments as they apply to contamination that may be significant for site specific decommissioning planning.

Comment G.4: Cost of required activities compared to potential benefits.

Commenters argued that the final rule survey and monitoring requirements, particularly as they were interpreted in the draft survey and monitoring guidance released with the proposed rule, would be a tremendous potential financial burden to licensees with no health and safety benefit to the public. Commenters said that sites already have sufficient existing survey, monitoring and detection programs in place to assure compliance with current licenses. In addition, the extent of modeling of the hydrology that would be required to meet the draft regulatory guidance does not appear to be warranted at sites that do not have extensive subsurface contamination.

One commenter argued that the scope of the proposed rule and guidance are far more extensive than warranted by the circumstances and both are inconsistent with the NRC's own finding that none of the instances of inadvertent releases to the environment presented a threat to public health and safety.

Response: The commenter is correct that the NRC's conclusion in its Liquid Radioactive Release Lessons Learned Task Force final report dated September 1, 2006, which was focused on inadvertent and unmonitored radioactive liquid releases from power reactors, was that the measured levels of tritium and other radionuclides do not present a health hazard to the public, and this finding was noted in the preamble to the proposed rule [73 FR 3814 c. 1]. However, as also noted in the preamble to the proposed rule [73 FR 3820 c. 1], based on past NRC experience, significant concentrations or quantities of undetected and unmonitored contamination, caused primarily by subsurface migration of ground water, has been a major contributor to a site becoming a legacy site. A legacy site is a potential radiological hazard and a threat to public health and safety.

As discussed in section II.B of this final rule, all power reactor licensees, and about 300 NRC and 1,000 Agreement State licensees have an obligation to set aside funds for decommissioning financial assurance. These licensees are subject to the amended regulations

in 10 CFR Part 20, and are already required to have radiation protection programs aimed toward reducing exposure and minimizing waste at their site [73 FR 3813 c. 2]. The NRC received no information during the proposed rule public comment period that any operating facility now has subsurface residual radioactivity at levels that would exceed the 10 CFR 20.1402 dose criteria at the time of facility decommissioning. Thus, the NRC believes there is no incremental burden for these licensees as a result of final rule amendments to 10 CFR Part 20, except to read and understand the final rule and the survey and monitoring guidance.

If there is a history of subsurface spills at a site, to the extent that a recurrence could result in significant residual radioactivity, then NRC expects appropriate licensee action to comply with the new survey and monitoring requirements as appropriate for site specific conditions. The survey and monitoring requirements in 10 CFR Part 20 are broad scope requirements that apply to many types of facilities, and thus cannot be specific to any one type of facility. Therefore, the extent of compliance with new survey and monitoring requirements and the level of licensee burden is very much a site-specific issue.

Comment G.5: Indian Point Nuclear Power Plant and Breazeale Research Reactor.

The State of New York and Riverkeeper cited in their comments on the proposed rule information about radioactive leaks from the Indian Point Nuclear Power Plant. The NRC takes this opportunity to discuss survey and monitoring requirements in this final rule by using public information of recent leaks at two nuclear facilities, one the Indian Point Nuclear Power Plant and the other a research and test reactor.

Response: A public meeting was held on May 20, 2008, in Cortlandt, New York, to discuss the results of NRC's inspection of the licensee's performance and the agency's independent assessment of contaminated ground water conditions that were first detected by the licensee at the Indian Point Energy Center in September 2005. NRC Inspection Reports Nos. 05000003/2007010 and 05000247/2007010, dated May 13, 2008, were referenced in this

report (ADAMS Accession No. ML081340425). The ground water samples contained tritium and strontium-90 that were not previously monitored or detected in ground water before late 2005. As determined by the licensee's hydro-geological analysis, and independently confirmed by the NRC, the contaminated ground water does not migrate off site except directly to the Hudson River. Because there is no current drinking water pathway derived from ground water or the Hudson River in the vicinity influenced by the Indian Point Energy Center, the primary radiological liquid effluent exposure pathway is through the consumption of aquatic foods such as fish and invertebrates. The licensee's radiological assessment of this pathway that was performed in accordance with NRC regulatory requirements, and confirmed by NRC inspection, determined that the radiological consequence of ground water migration to the Hudson River was, and continues to be, negligible with respect to NRC regulatory limits, i.e., the dose consequence to a hypothetical maximally exposed individual is no more than 0.1 percent of the NRC regulatory specification for liquid radiological effluent release.

In view of the potential radiological implications of contaminated ground water, NRC initiated enhanced regulatory oversight at Indian Point following the licensee's initial reporting of onsite sample data of ground water contamination. Subsequently, the licensee initiated a comprehensive investigation of the extent of onsite ground water contamination which included an extensive hydro-geological site characterization, the installation of several ground water monitoring wells, comprehensive radiological assessment, and the establishment of a long term monitoring program. As the NRC reported at the May 20, 2008, public meeting, NRC independently confirmed adequacy and acceptability of the licensee's investigation, radiological assessment, and plans for long term monitoring of the contaminant ground water conditions. The licensee's remediation approach (i.e., monitored natural attenuation) is considered reasonable by the NRC. Notwithstanding, the licensee's long term monitoring program will continue to be inspected by the NRC.

The State of New York, in Exhibit A of its comment to the Commission on the proposed rule, cited sample data taken of the contamination concentration levels. Based on the sample data, this level of residual radioactivity is likely to be below the 10 CFR 20.1402 unrestricted release dose criteria at time of Indian Point decommissioning. On the effective date of the final rule, the licensee must demonstrate that it is conducting operations, to the extent practical, to minimize the introduction of residual radioactivity at the site, including the subsurface [10 CFR 20.1406(c)]. The amended 10 CFR 20.1501(a), and the existence of previously undetected ground water contamination due to leakage from the Units 1 and 2 spent fuel pools, requires the licensee to continue monitoring the condition, and evaluate the need for additional monitoring and modeling at the plant in the event of new or additional leaks, spills, data from existing monitoring wells, or other information pertaining to residual radioactivity at the site. The licensee may modify or revise the scope of its monitoring effort at Indian Point based on demonstrated results, supported by analysis of sample and survey data, which indicate that operations and activities are conducted sufficient to minimize the introduction of residual radioactivity at the site. The sample and survey data is planned to be publicly available in ADAMS with the annual effluent and environmental reports.

In October 2007, the Pennsylvania State University Breazeale Research Reactor facility experienced a minor leak of slightly radioactive water from the reactor pool lining. In the following six weeks, the NRC performed several inspections at the facility [ADAMS ML073480163] and determined that the existing environmental monitoring satisfied licensee and regulatory requirements. The licensee reviewed its monitoring and decided to take samples from a nearby water well for overall area well quality. Contamination surveys were performed at the site to understand the migration of the residual radioactivity. The NRC inspection concluded the number and location of survey points were adequate to characterize the radiological

conditions. The NRC inspection report noted that the licensee always investigates readings above background levels and ensures that contaminated areas are decontaminated.

Following the effective date of this final rule, this licensee must demonstrate it is conducting operations, to the extent practical, to minimize the introduction of residual radioactivity at the site, including the subsurface. Also, the licensee must perform surveys sufficient to evaluate the need for additional monitoring and modeling at the reactor based on future leaks or spills or other information the licensee has relevant to residual radioactivity at the site.

There have been leaks at other research and test reactors with outcomes that affected decommissioning planning. For example, Cintichem, Inc., of Tuxedo, New York, held two NRC licenses, one for the operation of a 5-megawatt research reactor and another for special nuclear material. In February 1990, the licensee reported an unmonitored release of radioactively contaminated water from the reactor building to an onsite retention pond, and a second leak in an onsite concrete vessel (56 FR 23601; May 22, 1991). In May 1990, Cintichem informed the NRC that it had decided to decommission the reactor and related facilities. Over the next several years, Cintichem conducted cleanup activities and dismantled the reactor. The Cintichem licenses were terminated in 1998 with the site having been remediated to levels suitable for unrestricted use [63 FR 45268; August 25, 1998].

Comment G.6: The proposed rule is unnecessary.

One commenter, supported by several additional commenters, stated that existing decommissioning regulations contain appropriate requirements to provide reasonable assurance that legacy sites will be prevented. The programs that NRC licensees already have in place address all aspects of decommissioning planning, including conduct of operations to minimize contamination, monitoring and surveillance, recordkeeping, and financing. These programs are subject to NRC inspection and oversight. Another commenter argued that the

reduction of radiological risk associated with the proposed rule is extremely small, yet compliance will be very resource intensive and costly. One commenter agreed with NRC's statement that the vast majority of NRC materials licensees do not have processes that would cause subsurface contamination, but drew from that the conclusion that additional surveys should be required only at those limited sites where subsurface contamination may be a concern rather than requiring monitoring by all licensees. This commenter also asserted that the requirements in §20.1406(c) were unnecessary, because ALARA requirements covered the requirement to conduct operations to minimize subsurface and other residual radioactivity. Current regulations included consideration of subsurface contamination in the DCE, or could be addressed on a case-by-case basis through license conditions, and required materials licensees to minimize contamination, survey contamination, and keep records. This commenter believed the vast majority of licensees would be unlikely to have a reason for, or a means of determining, the volume of onsite subsurface material containing residual radioactivity.

Commenters opposing the rule as unnecessary stated that, at a minimum, the proposed rule and accompanying draft regulatory guidance should be held in abeyance until the issues identified by the commenter have been addressed. The commenter stated that the proposed rule and regulatory guides should be substantially rewritten, and this would require reissuance for public comment. In addition, the commenter encouraged the NRC to hold workshops with the affected stakeholders. Although the commenter believed the rulemaking is unnecessary, issues of importance to the staff might be pursued in these workshops.

Response: The NRC disagrees with these comments concerning the need for rulemaking. ALARA requirements in existing regulations do not explicitly address subsurface contamination and do not provide adequate assurance that additional legacy sites will be prevented. Before this final rule, NRC regulations did not explicitly specify licensees' obligations to survey subsurface contamination, nor did the regulations explicitly specify the requirement of

licensees to conduct operations to minimize residual radioactivity at the site, including the subsurface. This rulemaking will augment NRC inspection and oversight activities by defining the regulatory basis to mandate particular licensee actions on a timely basis to prevent the creation of more legacy sites. The radiological risk of a legacy site with ground water contamination may be significant. The NRC will issue draft Regulatory Guide DG-4014 to support the survey and monitoring requirements in this final rule, and will hold at least one public workshop to refine that guidance for issues of importance to stakeholders.

Comment G.7: The proposed rules are unnecessary because NRC could accomplish its objectives through inspection, oversight, and licensing activities.

Several commenters argued that the decommissioning issues raised in the proposed rule could be better addressed on a case-by-case basis through the licensing, inspection, and enforcement process for the unusual licensee that may have those concerns. This would be much more effective and efficient than attempting to adjust regulations that 23,000 licensees are obliged to read. One commenter stated that the rule seems to be an overly broad response to a narrow problem. If the NRC has concerns regarding the potential for "legacy sites" for only five to six licensees, then the more efficient path would be to impose site-specific and license-specific conditions on the limited set of facilities rather than impose regulations on all licensees with uncertain costs and even more uncertain benefits. Given the limited scope of the problem, as defined by the NRC, it does not make sense to introduce a new layer of NRC review and approval of survey and monitoring programs outside of licensing reviews.

Several commenters also recommended that statements should be added that certain categories of licensees currently satisfy the proposed requirements. According to one commenter, this statement should be made without qualification that NRC inspection and oversight programs provide the necessary guidance and license conditions/requirements to regulate activities for uranium mills undergoing decommissioning and remediation. One

commenter noted that the issue of controlling or limiting the release of radioactivity in licensed operations is different from the issue of intervention to address residual radioactivity that was previously permitted. In the latter case, no general solutions are available and a case-by-case analysis will be necessary. This is exactly what has taken place at the existing legacy sites. To the extent that the proposed rule seeks to require intervention to address residual radioactivity resulting from past, permissible activities, the rule is unlikely to have any impact on reducing the cost or complexity of decommissioning. Ultimately, the NRC's licensing and oversight programs are adequate to reduce introduction of residual radioactivity from current practices. Finally, two commenters argued that the proposed rulemaking contradicts the NRC's policy of risk based regulation. Each affected licensee will be required to spend an enormous amount of resources on monitoring programs to address an issue that by the NRC's own evaluation has no impact on the health and safety of the public. A more reasonable approach would be to address subsurface contamination concerns on a risk informed basis for individual licensees by means of the existing inspection and licensing process.

Response: NRC believes rulemaking is much more effective than relying on existing licensing, inspection, the Reactor Oversight Process and/or enforcement processes to accomplish regulatory objectives that were stated in the technical basis for the proposed rule. A legacy site can occur among a broad range of currently operating licensees. Section II.B in this final rule preamble identifies the licensees that are affected by this final rule. NRC agrees with the commenter that case-by-case intervention is not an effective regulatory approach to reduce the cost or complexity of decommissioning. As discussed in the response to comment G-9 and G-13, NRC considers this final rule to be risk-informed.

Comment G.8: The proposed rules are not stringent enough.

Several commenters generally opposed the proposed rules because they believe the rules are not stringent enough to protect the environment or promote safety, and will not make

NRC actions more effective, efficient, and realistic. One commenter believes the proposed regulations will encourage licensees to postpone the cleanup of radionuclide leaks until some future date, by which time a plume may be more difficult and expensive to decontaminate. This commenter argued that aside from a few modest improvements in limited aspects of the decommissioning process, the proposed rule does not address, in a meaningful way, the deficiencies in facility operations that lead to subsurface contamination, the threats posed by delayed remediation, or the risks of unfunded subsurface decontamination at nuclear power plants. This commenter stated that the final rule should require nuclear power plant owners and other licensees to: (1) actively prevent subsurface radionuclide leaks; (2) look for contamination under their sites; (3) publicly report what they find; (4) immediately clean up subsurface radionuclide contamination; and (5) increase their decommissioning funds to cover the costs of historical contamination at their plants. The commenter also called for the NRC to create an additional funding requirement when contamination is discovered by requiring licensees to update decommissioning estimates to keep pace with the actual subsurface and surface contamination conditions at their facilities; that is, require licensees to set aside ample funds to cover decontamination and decommissioning as if decommissioning were occurring now. Monitoring should be required at least every 2 years.

Response: The NRC agrees that this final rule provides regulatory flexibility to provide licensees discretion in determining the appropriate response to a contaminating event that does not pose a heath or safety concern, and licensees may in fact decide to postpone cleanup activities. The NRC disagrees with the commenter that the rule does not address events at operating facilities that lead to subsurface contamination and additional risks later, resulting from unfunded decommissioning activities. As stated in the proposed rule [73 FR 3814 c. 3], the activities that will be undertaken by licensees as a result of this final rule will provide a technical basis for licensees and the NRC to understand the effects of significant residual

radioactivity on decommissioning costs, and to determine whether existing financial assurance provided for site-specific decommissioning is adequate. By using the term "residual radioactivity," the new § 20.1406(c) and § 20.1501(a) cover any licensed and unlicensed radioactive material that have been introduced into the site by licensee activities. If operating events are causing significant amounts of residual radioactivity to accumulate onsite, those events will need to be mitigated to comply with the new § 20.1406(c).

This final rule contains provisions in § 30.35(e)(2), § 40.36(d)(2), § 70.25(e)(2), and § 72.30(c) to require licensees to update their DFP at least every 3 years to account for changes in costs and the extent of subsurface contamination. A separate set of similar funding update requirements is already applicable to power reactors.

Comment G.9: The proposed rules are not sufficiently precise.

Several commenters opposed the use of the phrase "to the extent practical" in proposed 10 CFR 20.1406(c), and the phrase "reasonable under the circumstances" in proposed § 20.1501 because the terms were too broad. One commenter stated that these phrases created a loophole that was compounded by use of the term "minimize," as opposed to "prevent." The commenter stated that these words will hamper, if not preclude, effective enforcement actions by the NRC or the U.S. Department of Justice against facilities and operators who release radionuclides to the subsurface area. A commenter representing several States also stated that use of the term "to the extent practicable" in the proposed rule could provide licensees with the leeway to perform very limited sampling or surveys to verify the extent of any subsurface plume, leading to erroneous conclusions regarding no significant hazards. Another commenter said the survey requirement must be clearly spelled out in the language of the regulation, to make it binding upon licensees. The current language is unacceptably vague.

Response: The NRC disagrees that the rule language is vague. The phrases "to the extent practical" and "reasonable under the circumstances" are already used in 10 CFR Part 20 requirements to provide flexibility in support of a risk-informed regulatory approach. The risk-informed approach is more effective to achieve acceptable results and compliance by licensees compared to a prescriptive approach which is cumbersome for licensees and regulators considering the broad range of licensees using radioactive material. The regulatory analysis in the proposed rule (page 45) addressed this specific topic as it relates to survey requirements, where it was noted that the Commission established a broad regulatory framework when § 20.1501 was added to the regulations in 1991. This final rule adds precision to survey requirements by amending § 20.1501(a) to explicitly include the subsurface at a site as an area that needs to be surveyed if concentrations or quantities of residual radioactivity in the subsurface present a radiological hazard. The proposed rule stated, "The staff views radiological hazards as including those resulting from subsurface contaminating events, when these events produce subsurface residual radioactivity that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402" [73 FR 3820 c. 2].

Comment G.10: The proposed rules are based on historical AEC legacy sites, rather than modern sites.

Several commenters stated that the NRC was basing the proposed rule on past, rather than current, problems. One commenter asserted that the very limited "examples" cited by the NRC of licensees for which some concern has existed do not support the broad brush approach proposed by the NRC in this rulemaking. The cited examples generally relate to licensees which had been operating long before the current regulations, comprehensive guidance, and discipline in reviewing license applications, contemporary licensee practices and awareness, and current decommissioning funding requirements were in place. The commenter pointed to

the example of burial in soil of radiological waste onsite, even if exceeding "exempt" regulatory limits at the time of burial, which was permitted for over 20 years without prior agency review. The commenter argued that it was likely that significant changes to the historical regulatory scheme with respect to onsite radiological waste disposal were at least factors in some of the site-specific examples of legacy sites of concern to the NRC, but these examples have been addressed within the current regulatory framework.

Response: The NRC agrees that previous changes to regulations on subsurface burials have reduced the likelihood of legacy sites. NRC disagrees that the current regulatory framework is sufficient to provide effective oversight of operating facilities to ensure the prevention of more legacy sites.

Comment G.11: The proposed rulemaking is a new regulatory scheme for "ongoing decommissioning".

One commenter, supported by several others, argued that the requirements for extensive subsurface soil characterization (or remediation) during an operating facility's lifetime is largely unrealistic. It is not feasible to perform subsurface characterization without risking the breach of barriers that contain radioactivity, disrupting the operationally essential equipment, or exacerbating the migration of contaminants already in the environment. Based on industry decommissioning experience, the majority of subsurface contamination (by volume and concentration) would likely be located directly under structures, systems and components (SSCs) that have leaked, where it cannot be safely or adequately accessed for characterization purposes. Even in the case of a reactor undergoing decommissioning, these areas usually cannot be accessed until late in the decommissioning process, when many of the SSCs and higher levels of contaminants sources have been removed. Another commenter stated that the dust and other materials stirred up during decommissioning could lead to greater exposures for site personnel, thus obviating much of the already small benefit of requiring site cleanup while

operations are ongoing. The prospect of "continual decommissioning" may also be contrary to the principles of ALARA embodied elsewhere in 10 CFR Part 20. One commenter requested that licensees be permitted to evaluate normal construction related risks associated with any proposed excavation of residual radioactivity, and that should these risks exceed the risks posed by the residual contamination itself, the licensee should not be required to excavate the material.

Response: As indicated in the response to comment F.2, conducting remediation actions while a facility continues to operate is not required by the proposed rule, even if significant amounts of residual radioactivity are present at a site. Based on the history of radioactive leaks at power reactors, the leaks can generally be attributed to the following SSCs: fuel transfer systems and spent fuel pools, buried piping, and storage tanks. Existing regulatory requirements may apply to SSCs that have leaked radioactive liquids, but determining which requirements apply to a specific facility requires review of the plant's licensing basis. SSCs that are not safety-related and are not covered by the licensee's quality assurance program generally are subject to less maintenance, testing and inspection than safety-related SSCs. The non-safety related SSCs are more likely to have a radioactive leak without detection, and a significant level of contamination from SSCs can migrate through the subsurface far from the source. One of the findings in the Liquid Radioactive Release Lessons Learned Task Force [73 FR 3814 c. 1] final report was that a majority of leaks at power reactors are from non-safety related SSCs that contain radioactive material.

Comment G.12: Variability in licensee practices in documenting spills and leaks important for decommissioning does not justify new requirements.

Several commenters stated that the proposed rule applies the same requirements to all types of licensees despite the inherent differences in how each type of licensee safely manages radioactive material and/or the financial assurance instruments for decommissioning.

Throughout the preamble to the proposed rule, NRC acknowledges that only a few sites have identified contamination and been faced with hurdles to releasing the site for unrestricted use. Nuclear generating facilities have all been successful to date in their decommissioning for unrestricted use.

Response: The NRC agrees that the 10 CFR Part 20 changes in this final rule apply equally to all NRC and Agreement State licensees despite the differences in facility operations and the extent of their radiation safety programs. However, only licensees that have an obligation to provide decommissioning financial assurance, and have liquid processes that would contribute to significant subsurface contamination, are likely to be affected by this rulemaking. The commenters are correct that no power reactor sites have become legacy sites.

Comment G.13: The proposed rules are based on unusual factual and economic circumstances that cannot be generalized to broad classes of licensees.

Several commenters noted that throughout the January 22, 2008, proposed rule NRC acknowledged that only a few facilities have identified contamination that has resulted in unexpected difficulty in decommissioning the site, and that the regulatory analysis represented these facilities as a certain type of licensee (i.e., rare earth extraction facility). Rather than targeting the proposed rule accordingly, the scope of the proposed rule includes all types of licensees, despite the inherent differences in how each type of licensee controls radioactive material. Another commenter stated that the proposed rule and draft guidance are attempting to apply a "one size fits all" approach at all NRC-licensed facilities without regard to the varying processes, radionuclides, and risks at different categories of licensees. For example, uranium mills, conversion facilities, and solution mining facilities have unique attributes making a "one size fits all" approach inappropriate.

Response: The NRC used a risk-informed approach in developing the language for the amendments to 10 CF Part 20 in the proposed rule. This final rule is not prescriptive, but

instead applies a broad and flexible regulatory framework as discussed in the response to comment G.9. NRC agrees in part with the comment regarding the unique attributes for uranium mills and solution mining facilities, as discussed further in response to the next comment.

Comment G.14: Applicability to uranium recovery facilities.

Several commenters urged the NRC not to make uranium recovery facilities subject to the new Part 20 requirements, because such facilities do not process enriched source material. One commenter stated that the proposed rule should not apply to decommissioning uranium recovery (UR) facilities. Another commenter requested that UR facilities (conventional mills, in-situ uranium recovery facilities and heap leach facilities) be categorically excluded from coverage under the proposed amendments to 10 CFR 20.1406 and 20.1501 in the final rule. A commenter stated that NRC inspection and oversight programs together with license conditions and existing regulations, adequately regulate uranium mills undergoing decommissioning and remediation, and are protective of the public health and safety and the environment. A commenter stated that the requirements in the proposed rule to address residual radioactivity during UR operations would result in new operational restrictions well beyond those imposed by existing licenses, and that the extreme variability of natural background radionuclide concentrations, and the presence of Technologically Enhanced radioactive Material (TENORM) and unprocessed ore at a site would introduce new requirements in survey and monitoring methods. Commenters also stated that the "routine" monitoring program described in the guidance would require a more complex and expensive program than is presently necessary to adequately characterize contamination or support decommissioning.

Response: The NRC agrees in part with the above comments. In finalizing the license termination rule, which established 10 CFR Part 20 Subpart E in 1997, the NRC recognized there are unique soil contamination issues associated with the decommissioning of UR facilities.

For this reason, 10 CFR 20.1401(a) was worded to exclude UR facilities from the scope of 10 CFR Part 20 Subpart E, and the NRC requested comments on what radiological criteria should be used in terminating UR facility licenses (62 FR 39093; July 21, 1997). The 10 CFR 20.1401(a) exclusion is not changed by the present rulemaking, and UR licensees and applicants will thus not be subject to the new requirements in 10 CFR 20.1406(c), just as they were not subject to the existing 20.1406 requirements.

As a result of the 1997 request for comments referenced above, Criterion 6(6) of Appendix A to Part 40 was amended in 1999 by adding its second paragraph, which established TEDE requirements to address the radionuclides of concern (chiefly uranium and thorium) present in the soils of UR facilities. See 64 FR 17506 et seq. (April 12, 1999). If UR facilities undergoing decommissioning have radioactive contamination in their soils associated with their operations at levels exceeding background by 5 pCi/g of radium-226 (the benchmark dose), Criterion 6(6) requires that such contamination be remediated. The present rulemaking does not change Criterion 6(6). The NRC thus does not agree with the commenter's concern regarding TENORM and unprocessed ore.

Because the 10 CFR 20.1501 survey and monitoring requirements are part of 10 CFR Part 20 Subpart F rather than Subpart E, they do not fall within the 10 CFR 20.1401(a) exclusion discussed above. For UR facilities, these survey and monitoring requirements must be read in conjunction with the 10 CFR Part 40 Appendix A Criterion 7 and 7A requirements. Together, these part 20 and part 40 requirements help ensure that issues of soil and groundwater contamination—both at operating UR facilities and those undergoing decommissioning—are properly addressed. For example, the operational monitoring and survey requirements in 10 CFR 20.1501 help ensure that the worker and public dose limits set forth in Subparts C and D of 10 CFR Part 20 are met, and UR facilities have been subject to these dose limits since 1991, when Subparts C, D, and F were first established. In that 1991

rulemaking, in response to a comment on then-proposed 10 CFR 20.1501's lack of specific monitoring requirements, the NRC explained that because part 20 contains the general radiation protection requirements that apply to all classes of NRC licensees, the wording of many of its provisions is necessarily general. See 56 Fed. Reg. 23360, at 23376 col.3 (May 21, 1991). With the limited exception discussed above regarding 10 CFR Part 20 Subpart E requirements, part 20 is still the set of general radiation protection requirements that is applicable to all classes of NRC licensees, including UR facilities. Accordingly, UR facilities are and will remain subject to the 10 CFR 20.1501 survey and monitoring requirements.

However, as indicated in the above discussion, the revisions to § 20.1501 made by the present rulemaking do not establish any new remediation criteria for UR facilities. Standards for decommissioning UR facilities, and the various related requirements for conducting soil and groundwater monitoring at UR facilities, are found in 10 CFR Part 40, Appendix A. The present rulemaking does not change any of these requirements. A UR licensee's program that complies with the 10 CFR Part 40, Appendix A site remediation criteria would thus not be impacted by § 20.1501(a)'s revised survey requirements, and such programs would not become more complex or expensive as a result of this rulemaking. The Part 20 worker and public dose requirements are combined with the remediation criteria for UR facilities in Part 40, Appendix A, as has been the case previous to this rulemaking.

The change in terminology from "radioactive material" to "residual radioactivity" in 10 CFR 20.1501(a) will not result in any new operational restrictions at UR facilities. Residual radioactivity, as defined in 10 CFR 20.1003, is not "residual radioactive material" as defined in 10 CFR 40.4. The latter term is used only with respect to materials at sites subject to remediation under title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The challenge to determine background levels of radiation at specific UR sites has not changed as a result of this final rule. Surveys must be performed, that are reasonable under the

circumstances, if there is a potential radiological hazard at a site. Commenters expressing concern about the unlicensed sources that are included in residual radioactivity, such as TENORM and unprocessed ores at a UR facility, have read more into the rule change in § 20.1501 than is intended. For example, UR facilities must currently manage ore because Criterion 5H requires that licensees protect underlying soils and groundwater from ore stockpile contamination. Furthermore, ore remaining at a UR site during decommissioning is considered 11e.(2) byproduct material and may be placed into the tailings impoundment, so long as it is not removed from the site for processing at another facility. As previously stated, radioactive soil contamination at UR sites undergoing decommissioning is addressed by Criterion 6(6). None of this is changed by the present rulemaking.

Comment G.15: Applicability to byproduct manufacturing licensees.

One commenter argued that radionuclide and radiopharmaceutical manufacturing licensees are within the scope of currently operating sites that NRC would not expect to become "legacy sites." The regulations should therefore categorically exempt them from the additional residual radioactivity monitoring requirements.

Response: Radionuclide and radiopharmaceutical manufacturing licensees are byproduct material licensees regulated under the requirements of 10 CFR Part 30. If such a facility has no credible release scenario that could contribute to significant subsurface residual radioactivity at the site, then it is likely that the licensee will not be affected by the final rule changes to 10 CFR Part 20.

Comment G.16: Applicability to research and test reactors.

Several commenters argued that research and test reactor licensees should be exempt from the final rule changes to new 10 CFR 20.1406(c) and amended 20.1501.

Response: Research and test reactors are licensed under the requirements of 10 CFR Part 50. If a research and test reactor has no credible release scenario that could contribute to

significant subsurface residual radioactivity at the site, then it is likely that the licensee of such a reactor will not be affected by the final rule changes to 10 CFR Part 20.

Comment G.17: Applicability to water treatment facilities.

One commenter asked NRC to address the potential applicability to licensed water treatment facilities and to make it clear that such survey and monitoring requirements likely will not be necessary at such facilities because: (1) their licensed operations involve the production of uranium-laden ion exchange (IX) resins that are substantially similar, if not identical, to those generated at *in situ* uranium recovery (ISR) facilities; (2) all equipment that generates such resins is, by license condition, contained within structures/buildings that provide primary and secondary containment to minimize, if not eliminate, potential releases of licensed material; (3) the resins do not present credible release scenarios where potential subsurface contamination would be implicated; and (4) the licenses contain strict monitoring and survey requirements.

Response: Licensees who possess uranium-laden resins at water treatment plants are source material licensees regulated under 10 CFR Part 40. Licensees possessing uranium-laden resins at water treatment plants are not subject to the 10 CFR Part 40 appendix A criteria, and are thus subject to the new Part 20 requirements. However, if a water treatment facility has no credible release scenario that could contribute to significant subsurface residual radioactivity at the site, then it is likely that the facility will not be affected by the final rule changes to 10 CFR Part 20.

Comment G.18: Residual radioactivity at publicly owned sewage treatment works.

A commenter noted that NRC's conclusion that municipal waste treatment facilities were unlikely to have significant concentrations of long-lived radionuclides fails to account for the potential impacts to such facilities if (1) the new uranium and radium Maximum Contaminant Levels (MCLs) are enforced effectively by EPA and their delegated States; and (2) uranium

and/or radium water treatment residuals are released in an uncontrolled manner into sanitary sewers or other discharge points from which such residuals could migrate.

Response: Regardless of whether the drinking water treatment plant is: (1) not removing radium from the drinking water (such as prior to the new EPA drinking water standards for radionuclides), or (2) removing radium from drinking water and discharging the radium-laden residuals to the sanitary sewage system, the amount of radium (or other radionuclide found in the source water) that reaches the publicly owned sewage treatment works (POTW) is unchanged. The NRC assumes, for purposes of this rulemaking, that EPA drinking water standards will be enforced effectively at municipal water treatment plants, and that any release of uranium and/or radium residuals will be done in a controlled manner consistent with license conditions and regulations. Recommendations are available from the ISCORS regarding actions that a POTW operator may take to determine if there is radioactive contamination at its facility and how to interpret the detection results. The recommendations are contained in ISCORS Technical Report 2004-04.

Comment G.19: Definition of residual radioactivity.

One commenter, supported by several others, argued that licensees should not be required to control unlicensed material in a manner that is substantively different from that required by a non-licensee, and stated that the definition of "residual radioactivity" in 10 CFR 20.1003 is inconsistent with a risk-informed approach to regulation and with the recently issued RIS 2008-03 "Return/Re-Use of Previously Discharged Radioactive Effluents." In further support of this argument, the commenter cited the proposed rule's preamble (page 3815, column 1) as excluding from the rule's scope off-site contamination attributable to previously released effluents, thus demonstrating the inconsistency of requiring the licensee to control onsite unlicensed material. This commenter accordingly requested that the NRC revise the

definition of “residual radioactivity” by deleting its reference to unlicensed sources, and its reference to routine releases of radioactive material.

Response: “Residual radioactivity” is a term already defined in 10 CFR 20.1003. Because no changes to this term were proposed when this rulemaking action was published for public comment, the request to now change the definition is outside the scope of this rulemaking. In considering the comment, the NRC re-examined the cited section of the proposed rule’s preamble [73 FR 3815 c. 1]. As stated there, the scope of this rulemaking “does not include offsite contamination discovered during decommissioning.” This preamble for the final rule deletes the following text which conditioned the above statement: “unless such contamination is an extension of onsite contamination (e.g., a contaminated ground water plume originating from the licensee’s facility).” What the NRC may later choose to do regarding offsite contamination discovered during decommissioning is unknown at this point, and making the above deletion avoids any limitation on future actions the NRC may take on this issue.

With respect to RIS 2008-03, when this RIS was issued, the term "radioactive material" was used in 10 CFR 20.1501(a) creating the need to differentiate licensed from unlicensed material. RIS 2008-03 provides a distinction between onsite and offsite unlicensed material. Offsite unlicensed material results primarily from authorized effluent discharges to unrestricted areas that have been evaluated in accordance with regulatory requirements. Radioactive effluent discharge controls, environmental dispersion modeling and dose assessments ensure that any public dose is within public radiation protection standards. The licensed radioactive material that was properly discharged in accordance with 10 CFR 20 to the unrestricted area is no longer the responsibility of the licensee. However, onsite unlicensed material is sometimes co-mingled with licensed radioactive material (for example from leaks or spills), and generally cannot be distinguished from or separated from licensed radioactive material. Both licensed and unlicensed radioactivity (e.g., from returned or re-used effluents) at the site are the

responsibility of the licensee, during operations and during decommissioning. Unlicensed radioactivity from the return or recycle of previously discharged radioactive effluents can be discharged in liquid or gaseous effluents to the environment in accordance with RIS 2008-03. The control of residual radioactivity at the site during operations increases the assurance that the 10 CFR 20.1402 criteria will be met at the time of decommissioning. The reasons NRC is using the term residual radioactivity in new § 20.1406(c) and amended § 20.1501 were set forth in the proposed rule's preamble [73 FR 3814 c.2]. The NRC does not agree that the definition of "residual radioactivity" in 10 CFR 20.1003 is inconsistent with RIS 2008-03.

Comment G.20: Clarify what is meant by "significant" residual radioactivity.

A commenter stated that the term "significant" is not defined and may be open to wide interpretation by licensees and others. Similarly, several other commenters stated that the NRC should define "significant" contamination, and should specify: (1) methods required to conduct surveys and their frequency, to ensure consistency in the ground-water monitoring and sampling program; and (2) the constituents to be sampled, the timing and frequency of the sampling, sampling techniques, and how to analyze samples.

Response: The intended meaning of the phrase "significant residual radioactivity" – which is not a defined regulatory term -- is discussed in the proposed rule's preamble [73 FR 3815 c. 1 and 3835 c. 3]. As stated there, "significant" residual radioactivity is a quantity of radioactive material that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402. Draft Regulatory Guide DG-4014, released for public comment to support this final rule, provides guidance to licensees on acceptable methods to conduct soil and ground-water sampling to meet the new survey requirements.

Comment G.21: Subsurface and significant contamination.

One commenter disagreed with the statement in the proposed rule's preamble [73 FR 3819 c. 3] that subsurface contamination occurs in an area at least 15 centimeters (6.0") below

the surface, arguing that instead it should be defined to, and inclusive of, the ground water table. The same commenter noted that "Significant contamination" is not defined, contrary to a recommendation made at page 22 of the 2006 Final Report of the NRC Liquid Radioactive Release Lessons Learned Task Force.

Response: NRC's use of the term "subsurface" in the proposed rule preamble is consistent with the definition of "subsurface" used in NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual." As stated on page 3-14 of that manual, the surface layer is represented as the top 15 centimeters (6 in.) and may include gravel fill, waste piles, concrete, or asphalt paving. Subsurface soil and media are defined on that same page of the manual as any solid materials not considered to be surface soil.

In this rulemaking, the NRC decided not to make "significant contamination" a defined term in the regulations. Instead, the NRC found that "residual radioactivity" – which is already a defined regulatory term – covers the type of subsurface contamination that prompted the creation of the Liquid Radioactive Release Lessons Learned Task Force. Additionally, as stated in the response to Comment G.20, the proposed rule's preamble provides guidance on the level of residual radioactivity that is considered to be "significant."

Comment G.22: Additional site characterization and monitoring not warranted.

Several commenters stated that the proposed NRC regulations could have the unintended consequence of triggering performance of extensive characterization and remediation efforts, without regard to the degree of actual health and safety impact. The proposed regulations would require the evaluation of subsurface contamination based on future decommissioning exposure scenarios, even though no foreseeable operating exposure limits would be exceeded. Furthermore, due to access constraints, it is unlikely that subsurface characterization efforts at an operating reactor would provide any better DCE input data (i.e., volumes and locations of subsurface media exceeding decommissioning criteria) than that

produced by experienced decommissioning experts making engineering judgments using information currently available as 10 CFR 50.75(g) file data.

Response: As stated in the proposed rule's preamble [73 FR 3813 c. 3], the NRC identified the need for licensees during facility operations to timely report the existence of subsurface contamination that has the potential to complicate future decommissioning efforts. But as indicated in responses to other comments, these commenters incorrectly state that the proposed regulations require the immediate evaluation of subsurface contamination even in cases where no foreseeable operating exposure limits would be exceeded by the contamination. As stated in draft Regulatory Guide DG-4014, released for public comment to support this rule, a licensee may decide to perform extensive characterization following its initial scoping surveys and preliminary characterization to determine if an area at the site contains significant residual radioactivity. There may be a need for additional monitoring and modeling, following evaluation of the initial scoping surveys, based on the significance of a spill or leak. But if there is no significant residual radioactivity at a site, then it is likely that the licensee's current monitoring plan is sufficient and no additional surveys or monitoring are necessary. When there is significant residual radioactivity at a site, survey results will serve as a technical basis to support the licensee's estimates of volumes and locations of subsurface contamination. Such estimates will in turn aid the licensee in arriving at a more accurate DCE.

Comment G.23: Frequency of surveys.

One commenter said that the phrase in 10 CFR 20.1501(b), which requires that records from surveys "describing the location and amount of subsurface residual radioactivity identified at the site" be kept, does not clarify whether the surveys made by licensees are simply one-time snapshots of residual radioactivity at one time, or if the surveys are to be conducted periodically. The commenter urged the NRC to specify that surveys are mandatory, conducted periodically, and the results submitted to the NRC and made public.

Response: The frequency of surveys is dependent on site-specific conditions and is a topic discussed in guidance. The survey results that are included in records important for decommissioning are a licensee recordkeeping requirement for NRC review. As noted in the response to comment D.4, the NRC understands that power reactor licensees will be submitting the onsite ground water sampling results as part of their annual effluent and environmental reports and this information is planned to be publicly available in ADAMS similar to the annual effluent and environmental reports that are currently publicly available.

Comment G.24: Assessed background radioactivity prior to operation.

One commenter questioned the NRC statement that materials licensees already must assess their background radiation prior to operation. Another commenter argued that materials licensees are not now required by 10 CFR 20.1301(a)(1) to make comprehensive measurements of radioactivity in soil or ground water before operation to distinguish levels of residual radioactive material from that due to natural background or the operations of others.

Response: The statement in the proposed rule's preamble that "All licensees with operating facilities must have performed an assessment of background radiation prior to operating their facility, to be compliant with the requirements in 10 CFR 20.1301(a)(1)" [73 FR 3819 c.3] is not correct, and NRC regrets the error. Measuring background before plant operation is not a regulatory requirement in 10 CFR Parts 20, 50 or 52. Instead, the position is stated in Regulatory Guide 4.1, "Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants", that a licensee or license applicant for a nuclear power plant should initiate preoperational monitoring 2 years before operations to provide a sufficient data base for comparison with operational data. This would include surveys of background radioactivity.

Comment G.25: The proposed rules effectively eliminate the option to use restricted release for license termination

A commenter stated that the intent of the proposed rule is to address amounts of residual radioactivity at a site that are significant to achieve effective decommissioning planning. For operating facilities, these events are assumed in the proposed rule to result in residual radioactivity in a quantity that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402. The established approach for determining the cost under ALARA is not factored into the proposed remediation decision. Further, as currently worded, the proposed rule and draft regulatory guidance have the apparently unintended consequence of eliminating the ability to use the restricted release criteria at license termination because a spill has to be remediated to the Derived Concentration Guideline Levels (DCGLs) for unrestricted release of the site. If the licensee does not remediate to the screening DCGLs, they must put money into decommissioning fund to remediate such that the license can be terminated for unrestricted use of the site.

Response: The NRC does not agree that it is effectively eliminating licensees' use of the restricted release option for license termination. On the contrary, the changes being made to 10 CFR 30.35(e)(1)(i)(B), 40.36(d)(1)(i)(B), 70.25(e)(1)(i)(B), and 72.30(b)(2)(iii) allow licensees during facility operations to base their DFP on the 10 CFR 20.1403 restricted release criteria, if the licensee can demonstrate its ability to meet the provisions of § 20.1403. The NRC will accept a reasonable methodology used by a licensee to evaluate remediation costs that support a licensee's decision regarding its response to a spill or leak, and to demonstrate that the licensee is achieving doses at the site that are ALARA. The DCGL screening criteria in NUREG 1757, Volume 1, Rev. 1, "Consolidated NMSS Decommissioning Guidance," apply when the site is a relatively simple site with residual radioactivity in topsoil, typically in the top centimeters of surface soils. For more complex sites with deeper subsurface residual radioactivity, the criteria for significant residual radioactivity may require an evaluation using a more complex modeling code, such as RESRAD or equivalent, to determine whether the

subsurface residual radioactivity is significant with respect to decommissioning criteria of 25 mrem per year total effective dose equivalent. Draft Regulatory Guide DG-4014 provides more guidance to licensees on this topic.

Comment G.26: Reporting and recordkeeping requirements.

Numerous commenters addressed the reporting and recordkeeping requirements. Most were critical, although for widely differing reasons. Several commenters criticized the requirements as unnecessary or too broad. One agreed that documentation of subsurface contamination should be placed in decommissioning records. However, the commenter stated that a small leak or spill inside a building that is promptly cleaned up is not a decommissioning issue. Thus, the commenter objected to references to “any” leakage or spills. Another commenter stated that licensees are currently required to report significant environmental impacts to both NRC-Agreement State agencies and the EPA. A commenter from a power reactor stated that reporting rules under Part 20 were unnecessary because of the requirements already in place in 10 CFR 50.75(g). One commenter also pointed to potential double counting, noting that 10 CFR Part 20 prohibits gaseous effluent releases to the atmosphere above regulatory limits. In accordance with 10 CFR Part 50, appendix I, releases within regulatory limits must account for the dose to the public. Thus, low levels of radioactivity could be deposited onto the site due to rainout, washout and other means, which could then leach into the subsoil. The proposed rule does not consider that these gaseous effluents are accounted for at the time of their release, causing them to be counted again. Finally, one commenter stated that if the proposed rule is finalized, more than 60 days will be needed to implement it. At least a year should be provided to prepare the required reports.

Response: Licensees are responsible for completing decommissioning activities, and thus must, for decommissioning planning purposes, determine which leaks and spills must be documented. NRC has removed its reference to “any” leakage or spills in draft Regulatory

Guide DG-4014. The NRC agrees that gaseous effluents that are properly discharged in accordance with 10 CFR 20 to an unrestricted area are no longer the responsibility of the licensee. However, because onsite unlicensed material is sometimes co-mingled with licensed radioactive material (for example from leaks or spills) and generally cannot be distinguished from or separated from licensed radioactive material, both licensed and unlicensed radioactivity (e.g., from returned or reused effluents) at the site are the responsibility of the licensee, during operations and during decommissioning. The control of residual radioactivity at the site during operations ensures that the 10 CFR 20 Subpart E criteria for unrestricted release will be met at the time of decommissioning. NRC agrees with the commenter on the effective date of the final rule and has established an implementation period of one year following publication of the final rule in the *Federal Register*.

Comment G.27: Public documentation of spills and leaks.

Several commenters argued that the proposed rule was inadequate because although licensees are required to keep records of spills and leaks on site, they are not required to notify NRC regional office or headquarters of the facts that such spills and leaks have occurred. Thus, information about spills and leaks will not be added to the "public side" of the Commission's ADAMS document management system, nor will the Commission ever "possess" a document for purposes of the Federal Freedom of Information Act. The proposed rule will not enable the public to see the company's memo documenting the leak, spill, or plume. These commenters argued that the final rule must require that all licensees submit their documentation of spills and leaks to the NRC and that the NRC promptly make such documentation available to the public. One stated that operating facilities must be required to inform state and local officials, with follow-up notification to the NRC regarding onsite leaks and spills into ground water, and onsite or offsite water sample results that exceed established criteria in the radiological monitoring program. Another said that all surveys and reports of leaks and spills prepared pursuant to

§ 20.1406, § 20.1501 and § 50.75(g) must be submitted to the NRC and disclosed to the general public through publication on the NRC'S ADAMS Database.

Response: The proposed rule did not contain new reporting requirements regarding spills and leaks, and the issues raised in this comment are not within the scope of this rulemaking.

H. Financial Assurance Mechanisms and Reporting

Comment H.1: Need for regulations.

Several commenters argued that the current decommissioning rules in 10 CFR Parts 20, 30, 50, 70, and 72 already provide reasonable assurance of adequate protection of public health, safety, and the environment related to decommissioning, and therefore new and additional financial assurance requirements are unnecessary. One commenter, whose comments were endorsed by several other commenters, cited that statement in SECY-03-0069 that "no licensee providing a parent company or self-guarantee has entered bankruptcy or has failed to proceed with decommissioning projects in an adequate manner." This commenter further quoted the SECY statement that the NRC "staff has not observed an example of an NRC licensee whose decommissioning funding fell short because of inadequate disclosure of the licensee's financial position." One commenter stated that the proposed rules contained some modest improvements in financial assurance for materials facilities and interim spent fuel storage installations, but argued that it did nothing to require licensees of operating power reactors to set aside sufficient funds for decommissioning.

Response: The proposed rule did not identify any changes to financial assurance requirements specifically applicable to nuclear power reactors. Thus, comments arguing for such changes are outside the scope of this rulemaking, and will not be considered here.

The NRC agrees with the other commenters that an extensive revision to the financial assurance requirements is not necessary, because in general the current requirements have worked effectively since they were promulgated in 1988. However, since then, the financial industry, accounting standards, bankruptcy law, and commercial law and practices have evolved, and the NRC periodically amends its financial assurance rules to address these changes. The NRC disagrees with the commenters that the current rules are fully adequate and require no changes to update or improve them. The agency's goal is to address potential risks to the financial assurance system as they are identified, rather than waiting until the risks manifest themselves as delays in decommissioning or the addition of more legacy sites.

Comment H.2: Financial tests.

One commenter stated that the current financial tests in appendix A (Parent Company Guarantee) and appendix C (Self-Guarantee) of Part 30 have proved to be an economical way for materials licensees to demonstrate financial assurance sufficient to fund decommissioning efforts. The NRC has not demonstrated a need, and in fact it is unnecessary, to impose greater restrictions in those tests to provide reasonable assurance of decommissioning funding. Another commenter expressed support for the clarification in the proposed rule that adjustments of "+" or "-" to bond ratings are included. However, another commenter questioned the proposed requirement that bond ratings be for the most recent "uninsured, uncollateralized, and unencumbered" bond issuance. The commenter stated that NRC had not presented any evidence concerning the need for this change, particularly because ratings for senior secured debt are a relevant indicator of good financial health. The same commenter argued that although annual reevaluation of the financial test was already the practice, such reevaluations should not be required to be certified by an independent Certified Public Accountant (CPA).

Response: Although the NRC agrees that the current parent company guarantee and self-guarantee mechanisms have been effective means of demonstrating financial assurance, it

believes that some of the proposed revisions to the financial tests that determine eligibility to use the guarantees will strengthen the tests and thereby increase the assurance provided by the guarantees. Other changes will codify established NRC practice. The NRC currently allows the use of "+" and "-" bond ratings. The requirement for "uninsured, uncollateralized, and unencumbered" bonds is currently part of some, but not all, financial tests used by the NRC and the agency is making all the tests consistent with respect to this criterion. The NRC is convinced that this requirement is desirable and increases assurance. An uninsured, uncollateralized, and unencumbered bond rating is an opinion on the ability of the issuer to meet its repayment obligations in a timely manner. Rating agencies typically go through an extensive financial evaluation process and credit analysis before they assign ratings to the debt of an organization, including meeting with management, examination of financial statements, research into industry and market conditions, and review of non-publicly available information obtained from the organization. However, bonds that are insured, collateralized, or encumbered are not rated in the same manner. Instead, the rating of insured bonds is based on the rating assigned the insurance company, and can change significantly if that rating changes. The NRC notes recent public discussions of sudden declines in the rating of insured debt instruments based on declines in the rating of the insurers. Similarly, the rating of collateralized bonds depends on an evaluation of the quality of the collateral rather than an evaluation of the underlying financial condition of the bond issuer, and can change quickly and significantly if the quality of the collateral declines. Bonds issued for certain purposes (usually by public entities) may be tied (encumbered) to property that is affected by activities paid for by the revenues from the bonds and the property may, in turn, serve as collateral for the bonds. The ratings for such bonds may be affected by all of these factors. Therefore, the NRC is requiring bonds used as part of a demonstration that the firm can pass a financial test to be uninsured, uncollateralized, and unencumbered. With respect to CPA certifications, this requirement is currently part of the

financial tests, and NRC did not propose to revise it. The agency therefore is going forward with the changes as proposed.

Comment H.3: Insurance.

One commenter addressed the NRC's decision not to require materials licensees to obtain environmental cleanup insurance/onsite property damage insurance. The commenter agreed with the NRC's assessment that the cost of such insurance would be prohibitive for a very rare event.

Response: In the absence of any comments supporting the inclusion of an insurance requirement, the agency plans to continue tracking the issue but is not adopting such a requirement at this time.

Comment H.4: License transfer application.

The three commenters who addressed this topic supported the proposed requirement to supply financial assurance information as part of a license transfer application. Two comments supported the §30.34 proposed requirements, and another supported the proposed addition to 10 CFR 72.50. This commenter pointed to the possibility of licensees spinning off a merchant nuclear plant into a new holding company with limited financial assets. The commenter stated that under the current regulations, it remains unclear what financial assurance applicants have to provide to the NRC to address this issue.

Response: The NRC agrees with the commenters that it is important, before approving a license transfer, to determine whether the proposed license transferee will be able to provide the required financial assurance for decommissioning. Therefore, the NRC is adopting this proposed requirement.

Comment H.5: Tangible net worth requirement increase to $21 Million.

One commenter agreed with the proposal to increase the tangible net worth requirement in the existing financial tests to address inflation since the financial tests were adopted, but

argued that the amount of $19 million was based on a calculation performed in 2005. This commenter stated that the NRC should recalculate the proposed $19 million for tangible net worth on the basis of 2007 or 2008 to ensure that it is fully current. The commenter estimated that approximately $21 million would be the more appropriate amount.

Another commenter noted that the proposed rule would also modify Part 30, appendix C to add a new criterion to the financial test for an entity that would provide a self-guarantee. The proposal would add a requirement for demonstrating a tangible net worth of at least $19 million. The commenter noted that the only basis given for this change is that it would make appendix C consistent with the financial tests in appendix A (parent company guarantees) and appendix D (companies with no outstanding rated bonds). However, the commenter argued that the proposed change is unnecessary, first because the proposed test ($19 million) has no correlation to the decommissioning obligation, and second because a focus on tangible net worth as a measure of financial stability and risk of default is unnecessary. The commenter stated that for many companies a $19 million tangible net worth test that excludes intangible assets would serve little purpose. The commenter concluded that NRC should not adopt this requirement.

Response: The NRC agrees with the comment to increase the tangible net worth requirement to $21 million for the financial tests, and has made this change in the final rule text. The NRC disagrees with the second comment, and is making the change to all of the financial tests in 10 CFR Part 30 as a means to provide regulatory consistency and to maintain regulatory efficiency. The tangible net worth test as one criterion for using a guarantee has been in the regulations since the parent guarantee was established in 1988 and is considered by NRC and the EPA as an effective financial threshold among the other financial tests that may be applied by licensees to use a guarantee mechanism.

Comment H.6: Inclusion of salvage value.

One commenter argued that the NRC should consider allowing DCEs to consider the resale value of product and other valuable assets, determined on a case-by-case basis. The amount could be limited to less than the contingency factor in the cost estimate.

Response: Since the financial assurance requirements were promulgated in 1988 the NRC has taken the consistent position, expressed in guidance until issuance of this proposed rule, that licensees should not take credit in their DCEs for the value of any materials that may be byproducts of the decommissioning process (e.g., salvage value). Estimates of salvage value are considered extremely speculative and uncertain, and allowing such estimates to be included in DCEs as offsets would raise the possibility that the amount of financial assurance would be inadequate if at the time of decommissioning such salvage value could not be realized. Allowing salvage value to be included up to the amount of the contingency factor would subvert the reason for the contingency factor, because it is required to address unforeseen technical situations that increase the cost of decommissioning.

Comment H.7: Assume 1 percent real rate of return in §20.1403 trust.

Several commenters addressed the proposal to require licensees to assume only a 1 percent real rate of return on funds set aside to provide long-term care and maintenance of sites decommissioned for restricted use. Commenters' positions ranged from support for the proposal to statements that the 1 percent rate was too high and statements that it was unnecessarily low.

Comment H.7.1: One commenter who supported the proposal noted that a similar provision is currently contained in 10 CFR Part 40, appendix A, Criterion 10, which provides that if a site-specific evaluation shows that a sum greater than the minimum amount specified in the rule is necessary for long-term surveillance following decontamination and decommissioning of a uranium mill site, the total amount to cover the cost of long-term surveillance must be that amount that would yield interest in an amounts sufficient to cover the annual costs of site

surveillance, assuming a 1 percent annual real rate of interest. The commenter noted that once reclamation is complete at Title II uranium mill tailings sites, the licensee is required to transfer the land containing the 11(e)2 byproduct to the Federal Government/Department of Energy (DOE) or to the State government (if the State agrees to accept it) along with funds (a minimum of $250,000 in 1978 dollars or more if necessary) to fund long term site monitoring and maintenance assuming a 1 percent real rate of return on the funds. The commenter believed that extending this type of regulation to other licensees is consistent and fair.

Response: No response is necessary.

Comment H.7.2: One commenter criticized the proposed amendment to 10 CFR 20.1403. This commenter argued that the 30-year period of interest rates examined by the NRC resulting in the 1 percent proposal did not adequately represent the highly variable history of interest rates. The commenter argued that NRC should incorporate the uncertainty of predicting future interest rates into its analysis of the correct rates for long term care by adopting a sliding and declining interest rate assumption. The commenter cited an academic expert's suggestion for a sliding scale of interest rates ranging from 4 percent (years 1-5) to 0 percent (years 300 and over). However, the commenter did not explicitly endorse the sliding scale provided in its comments.

Response: For the reasons discussed in the January 22, 2008, proposed rule, the NRC's view remains that an assumed 1 percent annual rate of return is an appropriate criterion to qualify for license termination under restricted conditions. From 1975 to 2005, U.S. Treasury Bills returned an average of 1.58 percent per year, and government bonds returned an average of 4.87 percent per year [73 FR at 3824 col. 1]. Additionally, the method by which the assumed annual real rate of return would be applied is the same as the method required by 10 CFR Part 40, appendix A, Criterion 10 (rule for determining the adequacy of funds provided by a licensee for long-term surveillance and control of tailings prior to the termination of a uranium or thorium

mill license). NUREG-0706 provides details to determine the minimum charge for long-term surveillance and control. Pages 14-12 through 14-16 of NUREG-0706, Volume 1, provide examples of the method, including Table 14.2 that shows different levels of the total fund amount based on three values of annual monitoring expense and three values for the real rate of return. The method used to derive the values in Table 14.2 is known as an annuity that has no definite end, which would be appropriate for long-term surveillance and control of a site contaminated with uranium or thorium. An annuity that has no definite end is a "perpetuity", or a "perpetual annuity". The present value of a perpetuity is equal to the amount of the annual payment, assumed to be in identical amounts each year, divided by the appropriate rate of return. The perpetuity acceptable to the NRC includes the annual payments for an independent third-party to perform the surveillance and control work, including the 25 percent contingency. For example, if the annual payment was determined to be $200,000 at the time the license was terminated, then a minimum amount of $20 million would be required at an assumed 1 percent real rate of return. This method to derive the value of an adequate amount of decommissioning financial assurance is not the same as a sinking fund method, suggested by the commenter, in which a sliding scale of interest rates could be applied over a specified period of time. The NRC considers an assumed annual 1 percent real rate of return on investment to be appropriate for 10 CFR 20.1403(c)(1) , as it is for 10 CFR Part 40, appendix A, Criterion 10, even if historically low rates of return prevail for extended periods of time. The method is well suited for assessment of sites for which restricted use is planned for license termination. Accordingly, the NRC is making no change to the rule text in 10 CFR 20.1403(c)(1) in the final rule compared to the proposed rule.

Comment H.7.3: Some commenters argued that the proposed rate to be used in determining the appropriate amount to be set aside in a trust for long-term surveillance and monitoring was too low. They argued that the trust funds would be managed to the standard of

care required by State or Federal law or one or more State or Federal regulatory agencies with jurisdiction over the trust funds, or, to the standard of care of that a prudent investor would use in the same circumstances. In light of these new restrictions on the handling and segregation of long-term funds, the adequacy of the trust funds should be assessed based on an assumed annual 2 percent real rate of return on investment. This would bring the treatment of long-term surveillance and monitoring funds into line with the other NRC regulatory provisions, such as 10 CFR 50.75(e)(l)(ii), which permit credit for projected earnings using up to a 2 percent annual real rate of return. One commenter noted that the 2 percent real rate of return assumption is already very conservative and is used over very long periods of time, including SAFSTOR periods for shutdown reactors. The commenter asserted that the NRC should not depart from a real rate of return standard that is already adequately conservative. The commenter stated that it did not find the argument for considering the 1 percent real rate of return compelling.

Response: For the reasons discussed in the response to Comment H.7.2, the NRC believes an assumed 1 percent annual rate of return is an appropriate criterion to qualify for license termination under restricted conditions.

Comment H.8: Standby trust established for all guarantees.

Several commenters opposed the proposed requirement that a standby trust fund be set up at the same time that a licensee proposes using a parent company guarantee for financial assurance. One commenter argued that to qualify for the parent-company guarantee, the licensee's guarantor must pass a rigorous financial test with acceptance criteria that banks, which would engage with licensees to establish the standby trust fund, may not satisfy. There would be no need for such a company, particularly with an AAA rating, to establish a trust fund with a bank with a rating that is at the same level or lower. It makes no sense for NRC to prefer to accept this potentially greater vulnerability. Another commenter noted that a Part 50 reactor licensee may have established a decommissioning trust and be using a guarantee to provide

financial assurance for the balance of the decommissioning assurance required. This commenter argued that a standby trust should not be required to support a parent company guarantee if the licensee has already established a decommissioning trust. The same commenter also argues that, for non-reactor licensees, this requirement imposes an unnecessary burden and significant cost, including the cost to develop the trust arrangements and ongoing trustee fees. These costs are not insignificant in the context of the amount of the guarantees being provided by many non-reactor licensees. Moreover, the cost is simply not justified given the already very high thresholds for qualifying to give a guarantee (e.g., an investment grade credit rating). A company that drops to a slightly below investment grade rating is not necessarily in financial distress. This itself is a very early warning signal, which can be used as the trigger point for requiring the creation of the trust and setting aside of funds, long before the company's ability to fund the guarantee can seriously be questioned. Thus, the commenter suggests that the requirement to establish a trust be imposed at the time this advance indicator of a potential financial issue arises, and payment under a guarantee is required under the new rules. For reactor licensees, the requirement for an existing standby trust is not a major issue, because existing trust arrangements should qualify to serve this purpose. If this requirement is retained, a clarifying sentence should be added: "An existing trust established for purposes of meeting the prepayment or external sinking fund methods pursuant to 10 CFR 50.75(e)(1) is acceptable to serve as the "standby trust." This commenter concluded that there is insufficient justification to require additional standby trust agreements for financially sound companies well in advance of the need.

Response: As stated in the proposed rule's preamble, the standby trust is necessary to ensure that if the entity supplying financial assurance is required to provide funds, the funds do not need to go directly to the NRC, which would then be required to remit them to the U.S. Treasury. For funds placed in a standby trust, the NRC can issue instructions to the trustee to

expend the funds on decommissioning without facing the possibility of significant delays in carrying out decommissioning. If the NRC has required the guarantor to fund the standby trust, it will be because the parent or self-guarantor no longer can pass the financial test and has not been able to obtain alternative financial assurance in an approved form. Thus, because the financial strength of the parent or self-guarantor at that point will not be sufficient to pass the financial test the argument about the financial vulnerability of the guarantor versus the vulnerability of the trustee is not relevant. Furthermore, the licensee should be able to set up a standby trust with de minimus funding at relatively little cost. The NRC is not aware of any reason why a nuclear power reactor could not revise and use a tax-qualified or non-tax-qualified trust fund that the reactor already has in place as its standby trust. Having the trust in place from the beginning of time that the licensee relies on a guarantee for its financial assurance will ensure that if the funds are needed for decommissioning delays will not occur while the trust is set up.

Comment H.9: Parent company guarantor is subject to Commission orders.

One commenter noted that the proposed rule would require that what is essentially a consent order be entered into by a parent company seeking to provide a guarantee on behalf of its subsidiary.

Response: The NRC believes that the provision under which a parent company, providing a parent company guarantee on behalf of its subsidiary, must agree that it would be subject to Commission orders to make payments under the guarantee agreement would essentially require the parent's consent to NRC personal jurisdiction, and acknowledgement that it is engaged in NRC subject matter jurisdiction, but not the parent's waiver of all hearing rights or defenses.

Comment H.10: Joint and several liability for the full cost of decommissioning.

Comment H.10.1: Several commenters opposed the proposal to make parent guarantors jointly and severally liable for the full cost of decommissioning. One commenter argued that the parent company guarantee is a legal commitment only to cover costs up to the guarantee amount. Another commenter stated that because financial auditors might consider it necessary, as a result of this "open-ended liability" to require firms to reflect the whole liability and not just the guaranteed amount among their liabilities on their financial statements, this could have the result of negatively impacting corporate credit ratings and the firm's ability to borrow.

Response: The joint and several liability clause is to be used as a last resort to cover any gaps in financial assurance. The joint and several liability clause is fair as a last resort measure because it is reasonable to assume that parent companies have accrued substantial benefits from their subsidiary licensees' operation of their nuclear facilities. In addition, the parent company can disclose through footnotes in its financial statements that it is providing a parent company guarantee for its subsidiary to cover decommissioning costs, but that in addition to the parent company guarantee, the subsidiary already has a sinking fund of a specific value or other mechanism to cover the cost of decommissioning.

Comment H.10.2: Another commenter that opposed the proposal pointed out that in some cases parent guarantees have been approved by the NRC for power reactor licensees. The commenter stated that the current parent guarantees that have been approved by the NRC in Orders in individual license transfer cases do not provide for joint and several liability between a parent guarantor and licensee. The commenter pointed, as an example, to a situation in which a company had acquired an ownership share in a reactor licensee and the NRC had approved a parent guaranty given by the parent company on behalf of the acquiring company to provide financial assurance for the difference between the amount that was deposited in a decommissioning trust account and the NRC formula amount for decommissioning, calculated

as of the transaction closing date pursuant to 10 CFR 50.75(c). The commenter noted that this arrangement was approved as part of a large commercial transaction, and imposition of a new requirement for the parent to assume joint and several liability above and beyond the amount of the parent guarantee would be a fundamental change, after the fact, to the terms of this transaction. The commenter stated that there has not been any practical experience demonstrating a need to impose such a joint and several liability requirements on parent guarantors, and that the proposed rule provides no specific evidence of any vulnerability in a parent guarantee arrangement, only a brief reference to a "potential" vulnerability [73 FR 3815]. The commenter therefore believes the NRC has not articulated a factual or legal basis justifying this proposed change to Part 30 and urges NRC not to adopt the proposed rule change.

Response: The NRC has approved individual license transfer cases without specifically requiring joint and several liability when parent company guarantees were used in part to demonstrate reasonable assurance of adequate decommissioning funding at the time of the proposed license transfer. However, acceptable mechanisms other than parent company guarantees may be used, and substituted, during the life of a plant following the transfer of a license should a parent company choose not to be potentially liable for the full cost of decommissioning. Furthermore, if a parent company guarantee is used in conjunction with another mechanism, the other mechanism should provide reasonable assurance that the parent will not be subject to liability beyond the intended value of the parent company guarantee. The justification for joint and several liability for parent companies was discussed in the response to Comment H.10.1. The NRC considers this new requirement to be fair as a measure of last resort.

Comment H.10.3: Another commenter noted that in 1998, NRC changed its rules to specifically permit the current practice of using a parent guarantee in combination with a trust fund balance, a practice which had been prohibited until 1998. In its September 22, 1998, final

rule (63 FR 50465, 50473), the NRC stated: "In sum, the NRC has eliminated the prohibition on combining parent company or self-guarantees with external sinking funds." Now, under existing 10 CFR 50.75(e)(1)(iii)(B), a parent guarantee for a reactor licensee is expected to conform to the "guarantee and test . . . as contained in appendix A to 10 CFR Part 30." Thus, the commenter believes a literal reading of the proposed rules would require reactors to conform any existing and future parent guarantee with the new joint and several liability requirement. The commenter argued this is a departure from the current practice, in which a guaranty is typically provided in a limited specified amount in combination with a trust fund or "external sinking fund." For example, if a licensee's trust balance were $350 million, and the NRC required amount of assurance were $360 million, the licensee might provide a parent guarantee in the amount of $10 million. The parent should not be guaranteeing the full $360 million. Because the proposed rule states that "No changes in these requirements are planned for power reactor licensees" [73 FR at 3818], the commenter believes that application of the proposal to power reactors may be an unintended consequence of the proposed changes to appendix A to 10 CFR Part 30.

Response: NRC agrees with the commenter that parent company guarantors of power reactor licensees decommissioning financial assurance must conform with the joint and several liability requirement. The argument, based on the 1998 rulemaking allowing the parent guarantee to be used in conjunction with other financial methods (63 FR 50465, 50473, sec. 7.J), that the Commission has rejected joint and several liability is not supported by the language of the 1998 preamble, which is silent on the topic. Moreover, in SECY-00-0126, June 8, 2000 (62 FR 44074) the Commission reiterated the position it had taken in its "Final Policy Statement on the Restructuring and Economic Deregulation of the Electric Utility Industry," published on August 19, 1997 (62 FR 44071), that private contractual responsibilities do not necessarily limit the NRC's regulatory authority. In the final policy statement, which

addressed the situation of co-owners of plants who had by contract defined the proportional responsibility of each co-owner for decommissioning, the Commission indicated that it "reserves the right, in highly unusual situations where adequate protection of the public health and safety would be compromised, if such action were not taken, to consider imposing joint and several liability on co-owners of more than de minimis shares when one or more co-owners have defaulted" (62 FR 44074). This final rule defines the potential responsibility of a parent corporation or limited liability company for the decommissioning obligations of its subsidiary, irrespective of the limited corporate liability or limited liability of a limited liability company parent, that would otherwise typically exist. With respect to the accounting consequences of the joint and several liability provision, the agency believes that a parent company that prepares consolidated financial reports will be required in any case to include the full potential decommissioning liability on its balance sheet, but will in addition offset the liability by the amount of the licensee's funded decommissioning trust fund or other financial assurance mechanism(s).

Comment H.10.4: Regarding the proposed addition of a joint and several liability provision (Section III.E) to Part 30 appendix A, pertaining to the parent company guarantee option for providing financial assurance, three commenters (including one with a power reactor in decommissioning status, and one with an operating power reactor who uses the parent company guarantee in combination with another mechanism to provide decommissioning financial assurance) objected. Section III.E states as follows:

> "The guarantor must agree that it is jointly and severally liable with the licensee for the full cost of decommissioning, and that if the costs of decommissioning and termination of the license exceed the amount guaranteed, the guarantor will pay such additional costs that are not paid by the licensee."

The third commenter stated that this requirement is a departure from the current practice, in which a guaranty is typically provided in a limited specified amount in combination with a trust fund or "external sinking fund," and that this departure would effectively eliminate the ability of power reactor licensees to combine use of the parent company guarantee method with an external sinking fund method for providing financial assurance. The commenter thus views proposed Section III.E as being a reversal of policy that will have an "unintended consequence," with respect to reactors, maintaining that its impact on reactor licensees is not discussed in the proposed rule's preamble. Instead, the NRC only stated more generally there that no "changes in these [financial assurance] requirements are planned for power reactor licensees" [73 FR 3818].

Response: As discussed below, the NRC does not agree that the proposed Section III.E is a reversal of policy having unintended consequences for Part 50 licensees.

Proposed Section III.E and broader related issues were fully discussed in the proposed rule's preamble. As stated there [73 FR at 3818, cols. 2-3], the parent company guarantee method is available to licensees who can demonstrate adequate financial strength through their annual completion of the financial tests contained in appendices A of 10 CFR Part 30. Additionally, the external sinking fund option allows licensees to gradually prepay the DCE. For power reactor licensees, the amount that is not prepaid may be covered by a surety, insurance, or by the parent company guarantee method. The NRC noted that a 1998 rulemaking (63 FR 50465; September 22, 1998) regarding power reactor financial assurance allowed use of a parent company guarantee with an external sinking fund, and that the present rulemaking applies analogous reasoning to 10 CFR Part 30, 40, 70, and 72 licensees, thus providing greater consistency with the 10 CFR Part 50 regulations. In this regard, pursuant to 10 CFR 50.75(e)(1)(iii)(A)(2)(B) and (2)(C), the NRC continues to allow Part 50 licensees to use the parent company guarantee and self-guarantee methods, and this rulemaking does not change

those regulations. Section III. E thus does not materially affect the decommissioning regulatory options available to Part 50 licensees or the liability of the guarantor. Rather, Section III.E provides added assurance that funds will be available at time of decommissioning even if the guarantor goes into bankruptcy, and it applies equally to the guarantors of power reactor decommissioning financial assurance, and to guarantors of facilities licensed under 10 CFR Parts 30, 40, 70, and 72.

Comment H.11: Issues when guarantor is in financial distress.

One commenter, supported by several additional commenters, argued that the proposed rule is overly harsh in requiring payment of the guarantee if a triggering event occurs. Options short of such payment should include use of a third party letter of credit. The rules should be revised to provide that upon NRC's determination that the guarantee is no longer acceptable, it may be replaced by another acceptable form of financial assurance.

Response: The current decommissioning financial assurance rules allow a licensee that has previously relied upon a parent guarantee or self-guarantee, but which no longer can do so because it or its parent cannot pass the financial test, to obtain a replacement form of financial assurance. However, if a guarantor's ability to pay its debts is compromised, the NRC may seek immediate payment of the entire DCE, or a lesser amount if the guarantee is combined with another financial assurance mechanism, to the standby trust. Under the existing financial assurance requirements, a licensee must notify the NRC in writing immediately following the filing of a bankruptcy action. The revisions to the requirements provide a more detailed description of the information to be provided in such a situation, as previously set forth in guidance.

Comment H.12: Elimination of the escrow.

Several commenters supported retention of the escrow as a financial assurance mechanism. One commenter argued that NRC lacked a clear basis for eliminating the escrow,

stating that the escrow account is a sound financial instrument that is protected to the same extent as a trust fund during bankruptcy. It stated that NRC's arguments that a dedicated trust fund should be outside the reach of creditors in a bankruptcy also would apply to a dedicated escrow account. The commenter noted that in cases where the amount of decommissioning funding assurance is relatively small, e.g., $100,000, use of an escrow account may be less expensive and more appropriate, because the cost of trust arrangements and annual trustee fees may be prohibitive. While eliminating the escrow option would thus particularly impact small materials licensees, small minority owners of power reactors during decommissioning may also want to use an escrow account. Two other commenters said that NRC should not limit the options (instruments) available for financial assurance, and noted that Agreement State licensees were using escrows.

Response: As stated in the proposed rule's preamble, the NRC does not agree that escrows are as secure as trust funds in the event of bankruptcy [73 FR 3819 c. 1], and the commenter's general statements to the contrary are not persuasive. While the NRC agrees that a number of financial assurance options should be available, the NRC must balance cost and availability with other factors, including especially the ability of the mechanism to provide funds for decommissioning when needed. The NRC has evaluated the likelihood that an escrow could survive the bankruptcy, insolvency, or financial incapacity of the licensee, and concluded that in comparison to other financial mechanisms like the trust, surety bond, or letter of credit, the escrow is significantly less secure. The U.S. Environmental Protection Agency decided in 1981 not to add the escrow account as an approved financial assurance mechanism [January 12, 1981; 46 FR 2827]. Based on these considerations, the NRC is removing the escrow from the list of approved mechanisms in 10 CFR 30.35(f)(1), 40.36(e)(1), 70.25(f)(1), and 72.30(e)(1). Note that this rulemaking does not eliminate use of escrows as an option for Part 50 licensees. Power reactor licensees are allowed to continue their use of an escrow account, pursuant to

10 CFR 50.75(e), due to an unintentional omission by NRC to include paragraphs 10 CFR 50.75(e)(1), (h)(1), and (h)(2) in the scope of the proposed rule text. The NRC plans to make that regulatory change in the future in a separate rulemaking.

Comment H.13: Elimination of the line of credit.

One commenter supported retention of the line of credit, noting that while no NRC licensees were apparently using a line of credit for financial assurance, such is not the case with respect to Agreement State licensees.

Response: The NRC finds that a letter of credit - which will be available for use - has many of the attributes in terms of cost and availability as a line of credit, but provides greater security. A line of credit can be cancelled quickly if certain financial conditions are not met, while a letter of credit represents a more binding obligation of the financial institution. Based on these considerations, and those discussed in the proposed rule's preamble [73 FR 3826 c. 3], the NRC is removing the line of credit from the list of approved mechanisms in 10 CFR 30.35(f)(1), 40.36(e)(1), 50.75(e)(1)(iii)(A), 70.25(f)(1), and 72.30(e)(1).

Comment H.14: Allowing intangible assets in the determination of net worth.

Some commenters disagreed with the proposal to allow intangible assets to be used in the determination of net worth for purposes of meeting the financial test applied to those seeking to use a parent company or self-guarantee financial assurance method. Two commenters, including CRCPD, pointed to recent overvaluing of bundled mortgage assets, and said that in light of this experience the NRC should reconsider allowing intangible assets to be used in conjunction with an investment grade bond rating to meet financial test criteria.

In contrast, several commenters representing both materials licensees and reactor licensees stated that consideration of intangible assets should be allowed. One commenter noted that the NRC had already granted an exemption to one licensee allowing a company with an investment grade bond rating to consider intangible assets to meet the 10 times ratio test.

The commenter noted that intangible assets generally include assets such as goodwill, brand value, or patents and that, as recognized in the proposed rule's preamble [73 FR 3812, 3825], financial accounting standards issued after 1988 (when the NRC's original decommissioning rule was adopted) provide objective methods for valuation of such intangible assets. According to the commenter, for a diversified technology and manufacturing company with a history of acquisitions intangible assets are a significant measure of the financial stability of the company. Another commenter stated that permitting the consideration of intangible assets is an appropriate change in light of the development of objective methods to value intangible assets.

Response: The NRC agrees with this latter set of comments. The NRC has examined a sample of firm financial reports to ensure that confirmatory information about intangible assets could be obtained from publicly available quarterly and annual reports of publicly traded firms. The NRC finds that bundled mortgage assets are sufficiently dissimilar to intangible assets that the recent problems associated with bundled mortgages do not provide a basis for withdrawing the proposed rule. On the basis of these considerations, and those discussed in the proposed rule's preamble [73 FR 3825], the NRC will allow the use of intangible assets.

Comment H.15: CPA evaluation of off-balance sheet transactions.

A commenter opposed the requirement that the CPA provide information about off-balance sheet transactions, stating that it was already difficult to meet the timetable for annual submittal of the financial assurance report, which already must be reviewed by a CPA. The commenter consulted with an independent accountant, who said that meeting the additional requirements would take considerable more evaluation time at a greater cost. According to the commenter, if the proposed provision is adopted, the date for submission of financial assurance reports will need to be extended by at least one month to allow reasonable performance of the additional evaluation. Another commenter argued that CPA certification was an unnecessary burden and cost, because company officials are already required to submit information that is

complete and accurate in all material respects, and this should provide adequate assurance that the financial information is being evaluated by qualified company personnel.

Response: Firms may, as a means of reducing risk or achieving tax minimization opportunities, account for certain kinds of transactions off the company's balance sheet. Recent experience has shown, however, that such off-balance sheet transactions may constitute a source of risk to the firm. Information should be readily available concerning such transactions, particularly for publicly traded firms. Section 401(a) of the Sarbanes-Oxley Act of 2002 requires disclosure of off-balance sheet transactions that may be material. The Securities and Exchange Commission in 2003 issued regulations to implement Section 401(a). The American Institute of Certified Public Accountants has prepared materials for company audit committees and accountants on the identification and evaluation of such transactions. The NRC therefore finds that the proposed requirement will be neither difficult nor unduly expensive for licensees to meet. The NRC is therefore retaining the proposed requirement in the final rule.

Comment H.16: CPA verification of bond ratings.

One commenter opposed the proposed new requirement for certification by an independent CPA of a parent company's or a licensee's bond ratings as part of showing that the criteria for using a parent company guarantee or self guarantee are met (as set forth in 10 CFR Part 30 appendices A and C, respectively). The commenter stated that this new requirement would impose an additional unnecessary burden and cost. Company officials now are required to submit information that is complete and accurate in all material respects, e.g., 10 CFR 30.10, 40.10, 50.5, 70.10, and 72.12. This should provide adequate assurance that the specific bond rating is being evaluated by qualified company personnel, and if the importance of such information needs to be emphasized the rule could simply require a company to certify its accuracy.

Response: In the past, those addressing the 10 CFR Part 30 Appendices A and C financial test criteria have frequently failed to correctly apply the requirement to use the current rating of the most recent bond issuance. As stated in the proposed rule's preamble [73 FR 3826 c. 2], NRC finds that requiring an audit of the bond rating will minimize the potential of future such errors being made. An independent CPA is already required to audit the financial test data for a parent company and a self guarantee, and adding the verification of a bond rating to this existing audit is not a significant burden.

Comment H.17: Requirement to base DFP on unrestricted release.

Two commenters supported the proposal to require licensees to base their DFPs and DCEs on unrestricted release, unless they can show the ability to meet the restricted release criteria. Making early funding arrangements to cover the increased costs of unrestricted release will increase the likelihood that the funds will be available when needed.

Response: The NRC agrees with these comments. Based on these considerations, and those discussed in the proposed rule's preamble [73 FR 3818 c. 3], the NRC is retaining the proposed requirement in the final rule.

Comment H.18: Basis for the cost estimate in the DFP.

One commenter argued that the DFP should include an estimate of the funds necessary to pay licensing fees. The public should not have to pay the costs of inspections, document reviews, license amendments, and other NRC regulatory activities when a license is taken over by an independent third party. Nor should a licensee be exempted for annual fees that ordinarily would have been assessed. Recovery of these fees should be part of any financial assurance.

Response: Applicable guidance (section A.3.17 of NUREG-1757, Volume 3, appendix A) specifies that one of the miscellaneous costs that should be included in the DCE is licensing fees. But making this a regulatory requirement was not proposed in the draft rules published for

public comment. The NRC thus views this comment as raising issues that are outside the scope of this rulemaking.

Comment H.19: Basis for certification.

Two commenters argued that DCEs should be based on a licensee's actual radionuclide inventory, rather than on license limits. Both stated that, for example, broad scope licensees may be licensed to possess multi-Ci quantities of a broad range of radionuclides, but may actually possess only limited quantities of radionuclides in a narrow range. The DCEs should be based on the historic use as indicated in licensee inventory records.

Response: This concern is addressed in part by existing regulations in 10 CFR Parts 30, 40, and 70, allowing licensees holding limited amounts of licensed material to certify and to provide specified amounts of financial assurance. Such licensees need not submit a DCE and DFP to NRC for approval. The NRC recently updated the certification amounts in another rulemaking, and in the current rulemaking is updating NUREG-1757, Volume 3, appendix A, Attachment 1 to reflect those changes to certification amounts. However, the agency did not propose in this rulemaking to revise the certification amounts or the basis upon which a licensee determines the certification amount it must provide. Therefore, the request to base the certification amounts on actual radionuclide inventory is not within the scope of this rulemaking.

Comment H.20: Use of third-party costs.

One commenter opposed the proposed requirement in § 30.35(e)(1)(i)(A) that each DFP must be based on the cost of an independent contractor to perform all decommissioning activities. It stated that its industry had extensive experience using licensee staff to perform decommissioning, and made use of custom-designed equipment that only licensee staff was experienced in using safely. Use of licensee staff, according to the commenter, provided the optimum cost effective schedule.

Response: The rule is not intended to preclude the use of licensee staff to carry out decommissioning activities. However, the financial assurance requirements are designed to provide the funds necessary to carry out decommissioning activities even when the licensee is no longer present or financially able to do so and, as a consequence, licensee staff are not available to perform decommissioning. Thus, NRC has recommended in guidance since 1988 that DFPs be based on the use of third party contractors, which as the commenter notes are likely to be more expensive than licensee staff, to ensure that if third party contractors must be relied upon the necessary funds are available. The proposed rule codifies the previously mentioned guidance.

Comment H.21: Timing of preparation of DFP and DCE.

One commenter stated that the proposed requirement in § 30.35(e)(2) to submit a DFP at the time of license renewal, in addition to submitting one at intervals not to exceed 3 years, would cause an excessive frequency of submissions because the license renewal interval is typically 5 years. The commenter suggested that submission of an updated DFP be required only at the time of license renewal or when a substantive change is necessary or as specified as a license condition. Of these alternatives, the commenter recommended specifying the renewal period as a license condition, possibly on the order of 5 to 6 years. The commenter argued that improvements in operations tended to cancel out inflation in the costs of decommissioning and waste disposal.

Response: Frequent revisions are desirable to ensure that the DCE remains accurate and reflects current prices for labor and materials, even in periods of rapid inflation. On balance, the NRC finds the benefits of frequent revisions to the DCE outweigh the costs, and that revisions should be submitted as part of a license renewal request in addition to being submitted every 3 years.

Comment H.22: Status of DFPs for operating power reactors.

One commenter criticized the proposed rules on the basis that they would require all types of licensees, except licensees of operating power reactors, to submit a DFP to the NRC if during the site survey the licensee detects radioactive contamination that would have to be removed during decommissioning. Under the proposed rule, the licensee would have a year after detection of the contamination to submit the funding plan or update to the NRC. The commenter supports this concept, and notes that it may in some instances serve as an incentive to minimize contamination so that the licensee does not have to go to the trouble and expense of preparing or updating a DFP and setting aside additional decommissioning funds. But the flaw in the NRC's proposed changes to 10 CFR 30.35, 40.36, 70.25, and 72.30 is the apparent exemption being granted to power reactor licensees. According to the commenter, a survey of a power reactor site may detect an amount of contamination that materially increases the cost of decommissioning, yet the NRC proposes to give such a licensee the option of doing nothing more than recording the information in the plant's decommissioning planning records. This is not acceptable, and is not protective of long-term public safety.

Another commenter objected to the proposed rule's failure to require full public reporting of the factors used to estimate decommissioning costs, and the NRC's failure to set a specific and responsible deadline for licensee submission of DFPs incorporating costs stemming from known subsurface contamination. The commenter urged the NRC to require power reactor, dry cask storage, and materials licensees to thoroughly survey their facilities for contamination within six months of the final rule's effective date, and submit a survey report and a DFP within a year of that date. The commenter said the NRC also should require reactor licensees to submit an updated DFP to the NRC within a year of discovery of site contamination.

Response: Existing 10 CFR Part 50 regulations (e.g. § 50.75 and § 50.82) contain a comprehensive set of decommissioning requirements unique to power reactors. The NRC does not agree that these requirements fail to adequately protect public health and safety. Moreover,

in the proposed rule's preamble, the NRC stated that it was making no changes with respect to the obligated amount for power reactor decommissioning financial assurance [73 FR 3818 c. 1]. Because the proposed rule did not address the manner or amount of financial assurance required for nuclear power reactors, comments seeking such actions are outside the scope of this rulemaking.

Comment H.23: Potential redundancy in DFP requirements.

Two commenters stated that in proposed § 72.30(b), paragraphs (b)(1) and (b)(4) are partially redundant and should be merged. The commenter also noted that the comment also related to the proposed rules in 10 CFR Parts 30, 40, and 70.

Response: The NRC disagrees that paragraphs (b)(1) and (b)(4) should be merged. Section 72.30(b) previously read as follows:

> "(b) The proposed decommissioning plan must also include a decommissioning funding plan containing information on how reasonable assurance will be provided that funds will be available to decommission the ISFSI or MRS. 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 or MRS."

In the proposed rule, 10 CFR 72.30(b)'s first sentence has become paragraph (b)(1), which states the overall general obligation regarding the DFP. The proposed requirement in paragraph (b)(4) largely repeats the text in the last sentence of the preceding paragraph, describing in detail the method of assuring funds. Both paragraphs (b)(1) and (b)(4) have independent utility – just as the two sentences in the former 10 CFR 72.30(b) had – so no change in the final rule will be made in response to this comment.

Comment H.24: Implementation schedule for submission of revised DFPs.

Several commenters addressed the implementation of the revised DCE and DFP requirements. One commenter urged the NRC to allow at least one year for licensees to prepare and submit their first updated DFPs, and to state this submittal time in the final rule. Another suggested that NRC should consider a time frame of 5 years for implementation, because existing sites would face significant costs retrofitting or upgrading their facilities.

Response: The NRC has established the final rule effective date to be one-year following final rule publication in the *Federal Register*. This provides sufficient time to respond to the revised DFP requirements. The NRC concluded that adoption of a period as long as 5 or 6 years between revisions of the DFP could cause the DCEs to fall substantially out of date.

Comment H.25: Special requirements for 10 CFR Part 72 licensees.

Comment H.25.1: One commenter, supported by several additional commenters, noted that proposed rule section 10 CFR 72.13 states that only § 72.30(e) and (f) apply to ISFSI general licensees (holders of a Part 50 License). The commenter believes that the basis for excluding ISFSI general licensees from compliance with the new requirements in proposed rule § 72.30(b), (c), and (g), was that these licensees have a Part 50 license and, therefore, have accumulated or have access to adequate funds for decommissioning. However, the commenter argued that as written the proposed rule § 72.30(b)(2)(i) would require holders of a Part 50 license, who are also Part 72 specific licensees, to submit a separate DCE for their ISFSI. This effectively prohibits the Part 50 licensee from continuing to include in the Part 50 DCE, the ISFSI decommissioning costs and related assumptions. The commenter urged the NRC to revise the proposed rule to allow a Part 72 specific licensee, who also holds a Part 50 license, to continue to include in the Part 50 DCE the ISFSI decommissioning costs and related assumptions. The same commenter also noted that, as written, the proposed rule § 72.30(c) would require holders of a Part 50 license, who are also Part 72 specific licensees, to report their adjusted ISFSI DCE information to the NRC at intervals not to exceed 3 years. Part 72

specific licensees that have a Part 50 license normally have included costs for decommissioning of the ISFSI in their Part 50 DCE. The proposed rule should be revised to allow a Part 72 specific licensee with a Part 50 license to continue to report their ISFSI DCE information to the NRC in their Part 50 DCE submittal using the Part 50 reporting interval.

Response: This rulemaking revises § 72.30(b), and adds new paragraphs (c), (d), and (g). Existing paragraph (c) is redesignated as paragraph (e), and existing paragraph (d) is redesignated as paragraph (f). Section 72.13(b) references the Part 72 provisions applicable to those holding Part 72 specific licenses, and 10 CFR 72.13(c) references the Part 72 provisions applicable to those holding Part 72 general licenses. Thus, any amendments to 10 CFR 72.30 need to be reflected in 10 CFR 72.13.

In considering this comment, the NRC realized that the proposed changes to 10 CFR 72.30 - as published in the January 22, 2008 proposed rule - are not fully reflected in the published amendments to 10 CFR 72.13. While the NRC correctly stated in its January 2008 proposed rule that 10 CFR 72.13(c) was being amended to reference 10 CFR 72.30(e) and (f) – reflecting the fact that existing 10 CFR 72.13(c) references 10 CFR 72.30(c) and (d) – the proposed revisions to paragraph (b), and the addition of new paragraphs (c), (d), and (g) to 10 CFR 72.30 are not referenced in the published amendments to 10 CFR 72.13. As discussed further in this document, the NRC is correcting the inadvertent omissions in the final rule, and finds that Part 72 general licensees were fairly on notice that they were subject to revisions in DFP requirements due to the provisions of existing § 72.30(d)(4).

As stated previously, existing 10 CFR 72.13(c) references 10 CFR 72.30(d). Thus, those holding Part 72 general licenses are subject to the 10 CFR 72.30(d) requirements, including the DFP provisions referenced in 10 CFR 72.30(d)(4). The new provisions in 10 CFR 72.30(b) provide further details of what initial DFPs must include. New paragraph (c) of 10 CFR 72.30 provides a set of timing provisions describing when updated DFPs must be submitted for

NRC approval. New paragraph (d) of 10 CFR 72.30 is a special 1-year DFP update provision based on 10 CFR 20.1501 survey results. Together, these new DFP requirements, for purposes of applicability, should be treated the same as the existing 10 CFR 72.30(d)(4) DFP provisions, as it would make no sense to have some but not all DFP requirements be applicable to Part 72 general licensees.

Existing Part 72 subpart K requirements already impose similar requirements on Part 72 general licensees. Existing 10 CFR 72.218(a) references 10 CFR 50.54(bb), which is the functional equivalent of a DFP provision in requiring a one-time report setting forth the licensee's program to provide funding for management of spent fuel during the time between when the reactor shuts down and when DOE accepts title to and takes possession of the spent fuel. Existing 10 CFR 72.218(a) further requires that a plan be identified for removing spent fuel from the reactor site in connection with decommissioning activities. Part 72 general licensees are thus already subject to spent fuel funding requirements. Similarly, 10 CFR 72.218(b) references 10 CFR 50.82, stating that such applications must describe how spent fuel will eventually be removed from the reactor site.

A further reason that the new 10 CFR 72.30 provisions referenced previously are applicable to Part 72 general licensees is the connection some of the provisions have [10 CFR 72.30(b)(2)(iii) and (b)(5), and 72.30(d)] with 10 CFR Part 20 requirements. Such requirements are applicable to the Part 72 general licensees because Part 20 is applicable to all Part 50 licensees.

Accordingly, the final rule amends 10 CFR 72.13(c) so that it correctly references 10 CFR 72.30(b), (c), (d), (e), and (f) as being applicable to holders of Part 72 general licenses.

The requirements of new 10 CFR 72.30(g) – under which licensees must replenish fund levels if decommissioning funds fall below specified levels – are unlike the previously referenced DFP and related requirements in that no similar provisions now exist in either Part 72 or Part 50.

Additionally, the January 2008 proposed rule gave no notice that any such provisions would be added to Part 50, and a Part 72 general licensee can only be subject to requirements that a Part 50 licensee is subject to. Accordingly, new 10 CFR 72.30(g) will be applicable only to holders of Part 72 specific licenses. There is no need to amend 10 CFR 72.13(b) in this regard, because it already specifies that 10 CFR 72.30 requirements apply to holders of Part 72 specific licenses.

Comment H.25.2: Another commenter argued that the NRC had approved partial exemptions from 10 CFR 72.30(c)(5) for Part 72 specific licensees to continue to rely on 10 CFR 50.75(e)(1)(ii)(A) as their exclusive mechanism for providing financial assurance for ISFSI decommissioning even after the reactor's Part 50 license was terminated. This commenter also encouraged the NRC to allow Part 72 specific licensees that no longer have a power reactor license under Part 50 to continue to use the methods of 10 CFR 50.75(b), (e), and (h) without the need for an exemption. The commenter provided recommended wording changes to 10 CFR 72.30(e)(5) to achieve this result.

Response: The NRC agrees with these comments and has made the suggested changes to the final rule text in § 72.30(e)(5), as discussed further in Section IV below.

Comment H.25.3: A commenter stated that to meet the requirements of this rule change, a Part 72 specific licensee will need a considerable amount of time and resources to prepare this DFP and its detailed DCE for submittal to the NRC. It is recommended that the NRC provide at least one year following the effective date of the rule change for Part 72 specific licensees to prepare and submit their first updated DFP. This submittal time should be stated in § 72.30(c) of the final rule.

Response: NRC agrees with this comment, except that there is no need to specify a submittal time in § 72.30(c). The NRC, in Section II.S of this final rule, has specified a one year implementation period for all of the final rule requirements (except for the reporting provisions in 10 CFR 50.82(a)(8)(v) and (vii), which are due by March 31, 2010).

Comment H.25.4: Several commenters cited the proposed provision in § 72.30(c) which states: "If the amount of financial assurance will be adjusted, this cannot be done until the updated decommissioning funding plan is approved." The commenters asked why increases could not occur before approval of the DFP. One commenter noted that § 72.54(e) currently states that, "the amount of financial assurance must be increased, or may be decreased, as appropriate, to cover the detailed cost estimate for decommissioning…" and recommended that the wording in the proposed § 72.30(c)'s last sentence be changed to read as follows: "If the amount of financial assurance will be decreased, this cannot be done until the updated decommissioning funding plan is approved."

Response: NRC agrees with the commenters that it needs to approve only reductions in the amount of financial assurance in the DFP. The NRC has made changes to the final rule text in § 30.35(e)(2), § 40.36(d)(2), § 70.25(e)(2), and § 72.30(c).

Comment H.25.5: A commenter noted that Part 72 does not have provisions for an ISFSI licensee to certify to a prescribed amount of financial assurance like Parts 30, 40, and 70 material licensees do. Therefore, the § 72.30(f)(4) wording, related to certifying to a prescribed amount of financial assurance, should be deleted and item (4) be reworded as: "(4) Records of the cost estimate performed for the decommissioning funding plan and records of the funding method used for assuring funds are available for decommissioning." The same commenter recommended changes in cross references in Part 72 to address proposed rule changes.

Response: The commenter has identified a technical error in the existing regulations which was not identified in the proposed rule. Because the suggested action to remove "amount certified for decommissioning" constitutes a technical correction, the NRC is making the correction in Part 72 even though it was not previously proposed. The NRC is also correcting cross references in the final rule.

Comment H.26: Monitor decommissioning fund investment balance.

Comment H.26.1: Several commenters disagreed with the proposed regulations in 10 CFR 30.35(e)(1)(iv), 40.36(d)(1)(iv), 70.25(e)(1)(iv), and 72.30(b)(6) requiring that if there are changes to the DCE, the amount of financial assurance must be revised to match the cost estimate. One commenter agreed that licensees might consider increasing decommissioning assurance when remediation costs exceed the initial DCE, but said the increase should not be a requirement. The actual remediation costs could exceed DCEs due to a licensee deciding for business purposes to choose an expensive method to remediate. This might be to minimize a business interruption or to organize the remediation around ongoing operations. Another commenter stated that the new rules require that additional financial assurance must be provided each year, if there is any shortfall in existing assurance levels. An annual assessment of financial assurance is already required by 10 CFR 50.75(b)(2), but the new rules would impose a firm requirement, which would be less flexible than NRC's current case-by-case evaluation of the funding plans for shutdown reactors. To assure that the new rule is not interpreted as a departure from current practice, the commenter recommended that NRC revise the language to provide that either additional assurance be provided or that the licensee submit an acceptable plan for obtaining additional assurance.

Response: Decommissioning financial assurance is required in the amount of the DCE. Just as a licensee that has not used its financial assurance proceeds wisely to remediate a site is still required to provide financial assurance to complete the remediation work, a licensee that decides to use a more expensive remediation method is required to provide financial assurance to cover the entire cost estimate. A plan for obtaining additional assurance is not considered financial assurance, and allowing a licensee to rely on a mere plan may result in significant delays and insufficient funds being available for decommissioning.

Comment H.26.2: Another commenter stated that the new § 72.30(g) of the proposed rule contains excessive requirements for monitoring and correcting fund balances. It noted that

Part 72 specific licenses are normally a 20 year license that will need to be renewed or extended until the U.S. Department of Energy takes title to the spent nuclear fuel. Based on continuing delays in the scheduled opening of the federal repository, a specific and realistic ISFSI facility decommissioning date cannot be determined, however, it may not occur until approximately 2030 or 2040. Based on such a long period of ISFSI licensed operations, the requirements in § 72.30(g) to monitor decommissioning fund balances "quarterly" and "at any time" and to increase fund balances "within 5 days" are very excessive. The commenter recommended several changes to simplify the rule and reduce an unnecessary burden on Part 72 specific licensees, while still providing adequate assurance and information to the NRC. The commenter stated that it was not clear why the requirements in both § 72.30(g)(1) and (g)(2) are needed, because the required action (increase fund balance within five days) and reporting requirement (30 day report to NRC) are essentially the same. One monitoring requirement that requires timely action and adequate reporting should be sufficient. Based on the long duration of ISFSI operations, an annual (versus quarterly) monitoring requirement and a 30 day (versus 5 days) requirement to increase the fund balance is considered more reasonable and adequate. The commenter provided recommended wording incorporating this recommendation. The commenter also suggested that the NRC could, if it found it necessary to know when a licensee's fund balance falls below 75 percent of the required amount, add a new reporting provision. The commenter recommended language for such a provision. Finally, the commenter recommended parallel changes to § 30.35(h), § 40.36(g), and § 70.25(h).

Response: While ISFSIs may operate for many years, always having access to adequate financial funds is crucial if the creation of additional legacy sites is to be avoided, and funding shortfalls cannot be tolerated. However, the NRC has considered the fact that some ISFSI licensees hold both Part 72 general and specific licenses at a single ISFSI site. With respect to providing financial assurance, Part 72 general licensees are subject to Part 50

requirements, and are thus required by 10 CFR 50.75(b)(2) to adjust their financial assurance annually using a rate at least equal to formula adjustment factors in 10 CFR 50.75(c). As discussed above in comment section H.25, new 10 CFR 72.30(g) applies only to Part 72 specific licensees. To achieve greater consistency in how Part 72 general and specific licensees are regulated in this regard, the NRC is revising proposed 72.30(g)(1) in this final rule to require that the fund balance be monitored every calendar year, rather than every calendar quarter.

The NRC considers ISFSI operations to be at a lesser risk of becoming a legacy site compared to other materials licensees because many of the Part 72 licensees are also electric utilities, and thus can more easily gain access to decommissioning financial assurance funding for their ISFSI operations. The proposed quarterly monitoring requirement is being retained in this final rule for Part 30, 40, and 70 licensees.

In further response to the comment, the NRC had decided to give Part 30, 40, 70, and 72 licensees 30 days – rather than the proposed 5 days – to increase the fund balances when specified funding shortfalls exist. The process of obtaining access to funds may, in many cases, take longer than 5 days, and such a short period of time may have generated an excessive number of exemption requests for more time. Accordingly, the proposed 5-day timing provisions are revised to 30 days in 10 CFR 30.35(h), 40.36(g), 70.25(h), and 72.30(g) of this final rule. Thus, if a fund balance drops by more than 25 percent, the licensee must increase the balance within 30 days of the occurrence, and the increase must be sufficient to cover the cost of decommissioning. If a fund balance drops by 25 percent or less, Part 30, 40, and 70 licensees must increase the balance within 30 days after the end of the calendar quarter, and the increase must be sufficient to cover the cost of decommissioning. In such cases, Part 72 licensees must increase the balance within 30 days after the end of the calendar year, and the increase must be sufficient to cover the cost of decommissioning.

Comment H.26.3: A commenter requested the following proposed licensee reporting requirements in 10 CFR 50.82(a)(8)(v) and (vii) be made available to the public: (1) The amount of funds accumulated to cover the current cost of managing spent fuel; (2) The projected costs of spent fuel management until the Department of Energy takes title to the spent fuel; and (3) The plan to obtain additional spent fuel management funds if the accumulated funds do not cover the projected costs. Potential delays in the availability of a long-term repository, issues of repository capacity, and the consequent likelihood of long-term storage of spent fuel at reactor sites make this information particularly important. This commenter also stated that the power reactor decommissioning fund should never be allowed to pay for onsite spent fuel storage.

Response: The financial assurance status report, due annually from the power reactor licensees under the proposed requirements in 10 CFR 50.82(a)(8)(v) and (vii), will be subject to the public disclosure requirements in 10 CFR 2.390. If a power reactor licensee considers the submitted information to be proprietary, the licensee must meet the requirements in 10 CFR 2.390(b) to support withholding the report from public disclosure. Absent such a showing, the report will be made publicly available in ADAMS. As stated by the commenter, this final rule requires in 10 CFR 72.30(g) that decommissioning financial assurance funds must be used only for decommissioning activities which would not include onsite spent fuel storage operations.

Comment H.27: Replenish funds if an external sinking fund is used.

Comment H.27.1: Almost all of the comments on the proposed requirements to track the level of decommissioning financial assurance, and to replenish the funds if, as a result of market fluctuations or other causes, they fall below certain specified levels, addressed the implications of the requirement for ISFSI's and related to 10 CFR 72.30(g) in particular. One commenter noted that the new § 72.30(g) requirements, which are consistent with the new requirements being added to § 30.35(h), § 40.36(g), and § 70.25(h) for other material licensees, would apply

only to Part 72 specific licensees. These new requirements are focused on the portion of a licensee's decommissioning funds that have been prepaid or collected and are subject to market variations. The licensee's funds associated with the prepayment and external sinking fund methods will be invested and may be subject to market variations. Because the prepayment method is expected to be fully funded at all times, the commenter believed the proposed wording would work for that mechanism. However, in the case of the external sinking fund method, the fund is not required to be fully funded until the final facility decommissioning is expected to begin. Section 72.30(b) of the proposed rule would require a Part 72 specific licensee to have an NRC approved DFP for their external sinking fund and to make deposits into the fund at least annually. Parts 30, 40, and 70 material licensees may also use an external sinking fund and could have an NRC approved DFP. The proposed wording in § 30.35(h), § 40.36(g), § 70.25(h), and § 72.30(g) does not recognize that a licensee's fund balance for their external sinking fund is not required to contain "the amount necessary to cover the cost of decommissioning" until the final facility decommissioning begins. As these proposed rule sections are currently worded, on the effective date of the rule change, some licensees would be required to fully fund their external sinking fund to cover the cost of decommissioning within 5 days and make the 30 day report to the NRC. The commenter therefore recommended that wording similar to the following be added to the proposed § 72.30(g)(1) and (g)(2) and the corresponding sections in Part 30, 40, and 70: "If …, the fund balance is below the amount necessary to cover the cost of decommissioning, or in the case of an external sinking fund the amount required at that point in time by the approved funding plan, the licensee must increase the balance to provide the required amount of funds ...."

Response: If funds from a Part 50 external sinking fund are to be used for Part 72 decommissioning, the funds must be reported separately under 10 CFR Part 72.30 for the ISFSI and held in a separate subaccount and this subaccount must be identified for spent fuel. The

certification for an external sinking fund will include a calculation section in which the licensee can take credit for future contributions that are provided by ratepayers and a 2 percent growth rate for the estimated number of years remaining prior to title transfer and possession of the fuel by DOE. For the Part 72 specific licensee, if this calculation yields anything lower than the total cost estimate, than the fund balance must be increased. If the fund balance is underfunded by more than 25 percent, the Part 72 specific licensee must fully fund the balance within 5 days of the occurrence of the funds dropping to this low of a funding level. If the fund balance is underfunded by 25 percent or less, than the Part 72 specific licensee must fully fund the balance within 5 days after the end of the calendar quarter.

Comment H.27.2: A commenter stated that the proposed rule was appropriate only for prepaid funds and should not be applied to ISFSI general licensee facilities using external sinking funds. The commenter also argued that the quarterly monitoring requirements and the reporting requirements were very excessive for ISFSI facilities, which may not be decommissioned until 2030 or 2040. The commenter stated that the rule should specify the NRC position/office which should receive reports, and whether a written report is required.

Response: The NRC partially agrees with these comments. The reporting requirements in § 72.30(b), (c), and (d) apply to Part 72 specific and general licensees. The financial assurance requirements in § 72.30(e) and the maintenance of records important for decommissioning and the DCE in the funding plan in § 72.30(f) also apply to Part 72 specific and general licensees. The final rule language in § 72.30(e)(5), allowing use of the external sinking fund in 10 CFR 50.75(e)(1)(ii) as the exclusive funding method, applies to Part 72 licensees who are issued a power reactor license under 10 CFR Part 50, or Part 72 specific licensees who also are an electric utility, as defined in Part 50. Regarding the reporting requirements in § 72.30(g), which apply to Part 72 specific licensees, if the decommissioning fund balance needs to be replenished, a written report identifying that such action needed to be

taken is to be submitted to the Director, Office of Federal and State Materials and Environmental Management Programs. The NRC is not adopting the commenter's suggestions regarding the timing of required reports, finding that the quarterly monitoring of funds is a prudent business practice. Also, the NRC considers the annual reporting of a financial status report to be a reasonable burden as part of a licensee's responsibility to maintain an accurate DFP.

Comment H.27.3: Two commenters supported the changes to § 72.30 because they address the concern that – depending on future NRC actions – spent fuel could remain in dry cask storage at reactors for decades, providing the potential for additional adverse environmental impacts whose remediation costs must be assessed and addressed in the decommissioning plan. This commenter noted that the proposed rule appears to require more specific reporting requirements for ISFSI licensees than would be required for power reactor licensees.

Response: NRC shares the commenter's concern about the length of time spent fuel may need to be managed at the ISFSI facility. The NRC provides oversight of the facility operations and decommissioning to prevent adverse environmental impacts. The commenter is correct that the content of the spent fuel financial status report required by proposed 10 CFR 50.82(a)(8)(vii) differs from the content of decommissioning financial assurance reports required of power reactor licensees.

Comment H.28: Support for more detail in the DCE.

Comment H.28.1: Two commenters supported the proposed requirements in 10 CFR 30.35(e)(2), 40.36(d)(2), 70.25(e)(2), and 72.30(c) requiring the licensee to address how routine spills and accidental releases affect the cost of decommissioning. They believed this requirement would be a useful reinforcement to the requirements in § 40.36(f) and § 20.1101(b), which had been interpreted to require reducing dose to a receptor, but not to be drivers for

environmental monitoring or remediation, particularly if the presumed receptor was not drinking water from the site. Historically, according to these commenters, sites were not characterized until shortly before closure and routine spills were not considered significant. The commenters believed that the identification of source terms during operations would reduce the possibility of underestimation of public dose. In contrast, one commenter argued that although current regulations do not specifically require a licensee to increase its decommissioning financial assurance following a spill if the licensee decides to defer remediation to a later date, this requirement is covered by broader requirements, including ALARA provisions and the cradle-to-grave principle in managing licensed materials. These provisions can be written into the section of the DFP that specifies how the cost estimate and funding assurance are maintained and kept current. Also the plan typically will have a 25 percent contingency for unexpected cost increases that would cover all but the most unusual spill.

Response: The NRC agrees that the documentation of spills and accidental releases will improve the basis for the DCE, and the identification of source terms at the site during operations will help to reduce the possibility of underestimation of public dose due as a result of contaminant migration beyond the licensed site. NRC regulations allow some discretion in the licensee response to a spill or leak that is not an immediate safety concern. If the licensee chooses to defer remediation to a later date in such a situation, the licensee must document the release in its records important for decommissioning and the added cost, if any, to remediate the spill or leak which must be included in the cost estimate, DFP, and financial instruments used as decommissioning financial assurance.

Comment H.28.2: One commenter stated that the NRC should ensure that there is a direct correlation between decontamination costs and decommissioning funding assurances. To implement this the NRC should require bi-annual funding reports and a link between the changes proposed to 10 CFR 20.1501 and the DFP required by 10 CFR 50.75(g).

Response: The NRC agrees with the commenter regarding a direct correlation between the DCE and the financial assurance provided by the licensee. New 10 CFR 20.1501(b) provides a link to the existing 10 CFR 50.75(g) provisions in requiring that survey records of subsurface residual radioactivity be kept with records important for decommissioning.

Comment H.29: Reporting requirements for shut down power reactors.

Comment H.29.1: One commenter interpreted the proposed 10 CFR 50.82(a)(8) reporting requirements as also creating a requirement that an operating utility with a shut-down reactor that funds its spent fuel storage costs from its operating budget, would instead now need to set aside large amounts of dedicated funding to pre-fund the costs of spent fuel storage.

Response: The proposed changes in 10 CFR 50.82(a)(8) specify increased reporting requirements for all licensees with a power reactor in decommissioning status. These reporting requirements do not change in any way the existing 10 CFR 50.75 requirements to prepay decommissioning financial assurance, or the existing 10 CFR 50.54(bb) requirements to provide funding for the management of irradiated fuel until title and possession of the fuel is transferred to the Secretary of Energy.

Comment H.29.2: A commenter stated that it is not clear what is meant by "the decommissioning criteria upon which the estimate is based" in proposed 10 CFR 50.82(a)(8)(v)(B).

Response: The proposed 10 CFR 50.82(a)(8)(v)(B) is a required element of the annual financial assurance status report to be submitted by shutdown power reactors, requiring such licensees to update DCEs. Such estimates must reflect whether the site is planned to be released for unrestricted use, or is planned to be released under restricted conditions. Both of these release options are available -- based on how the term "decommission" is defined in § 50.2 -- and the option chosen will affect decommissioning costs.

Comment H.29.3: One commenter argued that the proposed 10 CFR 50.82(a)(8)(vii) reporting requirement regarding spent fuel management costs was not necessary for facilities that are owned by operating utilities with a significant electric sales income and who have access to rate relief. According to this commenter, for sites owned by an operating utility, the annual expense for nuclear fuel storage will be a very small percentage of the utility's total operating budget and would be included in rate relief proceedings.

Response: Regardless of company size, all licensees must demonstrate and provide adequate financial assurance for decommissioning. For facilities that are owned by an electric utility, as defined in 10 CFR 50.2, this demonstration (described in NUREG-1757, Volume 3, Revision 1 released with the final rule) may include a calculation for an external sinking fund in which the licensee can take credit for future contributions that are provided by ratepayers and a 2 percent growth rate for the estimated number of years remaining prior to DOE taking title and possession of the spent fuel. The NRC agrees that the annual expense and future contributions for nuclear fuel storage will be a small percentage of an electric utility's total operating budget.

Comment H.29.4: A commenter noted some technical obstacles to the proposed reporting under 10 CFR 50.82(a)(8). First, because DOE has provided no reliable basis for determining when it will begin to perform and complete its obligation to remove the nation's used nuclear fuel from individual facilities or take title to the fuel, the total cost of fuel storage cannot be estimated. The total cost is the summation of annual expenses over time, and because there is a lack of any definitive information on the duration of the storage periods it is unreasonable to require the owners to pay up-front a projected unknown total cost of nuclear fuel storage. Second, under the DOE Standard Contract and legal decisions, DOE is liable to pay for the storage cost for nuclear fuel. Ongoing and possible future litigation will eventually determine the schedule and amounts for which the DOE is responsible. For permanently

shutdown plants, it is the DOE, not the utility, which should be required to provide financial assurance for fuel storage.

Response: The extent to which the DOE may be responsible for onsite spent fuel storage costs is an issue that is outside the scope of this rulemaking. Moreover, the NRC disagrees with the claim that total spent fuel storage costs cannot be estimated. Similar cost estimates for decommissioning are required by existing regulations [10 CFR 50.82(a)(8)(iii)], and have duly been submitted by NRC licensees. While estimates of future costs will always be based on uncertainties to some extent, this does not mean that no estimate at all can be made. This is as true for estimated spent fuel storage costs as for any other estimated cost.

Comment H.29.5: One commenter argued that the NRC is imposing a new annual reporting requirement on shutdown reactors that requires a higher level of detail than the annual decommissioning funding status reports currently required under 10 CFR 50.75(f). It is not clear why the existing reports are not adequate, but at a minimum, there should not be duplicative requirements. If NRC adopts this provision, it should remove the reporting requirement under 10 CFR 50.75(f). To the extent that NRC's desire is to ensure appropriate funds will be available by reviewing the historical expenditures, power reactor licensees are able provide this information. However, it is unlikely to be useful other than for interest's sake, and further use of this data to predict future decommissioning costs may be suspect. The value of the reporting requirement does not justify burden upon licensees, because only a few plants have decommissioned to unrestricted release and this data does not constitute a representative sample. Licensees will be unduly challenged by rate regulators, financial auditors and other stakeholders having opposing interests as they relate to funding decommissioning. The existing NRC minimum funding formulae provide stability in rate regulation prior to retirement. Estimates of only forward-looking expenses have provided the same stability for retired units. This section should be focused only on forward-looking needs to meet decommissioning liabilities.

Response: The final rule 10 CFR 50.82(a)(8)(v) reporting requirements do not duplicate the existing 10 CFR 50.75(f) reporting requirements. As stated in the proposed rule's preamble [73 FR 3828 c. 1], the reports under 10 CFR 50.75(f) do not require information on the actual amount of funds spent on decommissioning, whereas such information is required by proposed 10 CFR 50.82(a)(8)(v). The new reporting requirements are not intended for comparison between different power reactor decommissioning costs. The purpose of obtaining the information reported under 10 CFR 50.82(a)(8)(v) is to identify actual expenditures at a particular site and projected costs to complete the decommissioning.

I. Draft Regulatory Guidance

Comment I.1: The survey and monitoring guidance goes beyond what is required.

Several commenters criticized the draft guidance on subsurface residual radioactivity. They argued that the guidance went substantially beyond what the rule required with respect to site surveys, the timeframe for remediation, retrofitting facilities to eliminate sources of subsurface residual radioactivity, monitoring, use of MARSSIM, and remediation during operations. One commenter, who provided detailed comments on many parts of the guidance, stated that it described actions that were not necessary to protect public health, safety, and the environment.

Response: All comments were reviewed and considered by the agency in preparing draft Regulatory Guide DG-4014 released for public comment to support this final rule.

Comment I.2: The survey and monitoring guidance requires prompt remediation.

A commenter on the draft guidance on subsurface residual radioactivity argued that, as written, the remediation language in the draft regulatory guidance document could have the unintended consequence of disrupting safe plant operation, without regard to actual health or environmental impacts. Another commenter, supported by several additional commenters,

argued that the emphasis on “prompt” remediation, found especially in the draft guidance, of a leak or spill is unreasonable and is not always practically achievable. Licensees should be given the flexibility to define the appropriate timeframe for clean-up of a spill or leak, taking into consideration ALARA, realistic exposure pathways, and the site-specific soil and ground water characteristics. Another commenter said it makes little sense to require remediation during operation of the site. The commenter noted that the draft guidance encourages licensees to perform cost-effectiveness analyses of prompt versus delayed clean up of residual radioactivity at the site.

Response: The NRC is aware that in some cases subsurface residual radioactivity is located where the only feasible remediation measures that can be taken without disrupting safe plant operation must occur at the time of final plant decommissioning. The NRC does not intend that licensees adopt remediation measures that will disrupt safe plant operation. The topic of cleanup activities during facility operations, especially in the context of soil contamination, is very dependent on site-specific conditions. In response to the commenters, the NRC has applied a performance-based approach in the DG-4014 survey and monitoring guidance released for public comment to support this final rule. Small leaks and spills that have no impact on decommissioning planning are not within the scope of the guidance, but the larger leaks and spills to the subsurface that could affect decommissioning planning are addressed in the guidance. The NRC has placed in draft Regulatory Guide DG-4014 a discussion on different approaches that may be used by licensees to determine the cost-effectiveness of prompt compared to deferred cleanup. Licensees should become familiar with this guidance and can develop reasoned explanations to support deferral of cleanup activities where there has been a significant amount of subsurface contamination.

Comment I.3: The survey and monitoring guidance should clarify cost-effectiveness calculations.

One commenter stated that the cost-effectiveness calculation recommended in the guidance will nearly always show that it is more cost-effective to wait until a site has ceased operations to dispose of contaminated soil or conduct any remediation. The proposed regulations would require and the guidance describes methods to evaluate subsurface contamination based on future decommissioning exposure scenarios, even though no foreseeable operating exposure limits would be exceeded.

Response: The NRC agrees with this comment that it is likely that licensees will decide to remediate soil contamination during decommissioning rather than during operations, although this is a site-specific and licensee-specific decision. The NRC believes it is beneficial for licensees to remediate certain types of contaminating events on a timely basis. This certainly includes contaminating events that have the potential to reach a ground water pathway or that are cost-effective to perform earlier rather than later as determined by an analysis performed by the licensee, as recommended in draft Regulatory Guide DG-4014.

Comment I.4: The survey and monitoring guidance is contrary to Commission direction.

A commenter stated that that the draft guidance's references to MARSSIM for "subsurface" survey requirements, documentation and quality assurance/quality control requirements are contrary to the Commission's SRM in SECY-03-0069 regarding MARSSIM.

Response: This final rule is not requiring any MARSSIM submittals. The optional use of the MARSSIM screening values is discussed in draft Regulatory Guide DG-4014 along with several other low cost approaches as a means for the licensee to apply sampling concentration results to dose based results. The dose based results are the basis by which the facility will be evaluated for license termination.

Comment I.5: The financial assurance guidance needs to clarify acceptable methods for Part 72 licensees.

The comments on the revisions to NUREG-1757, Volume 3, raised questions concerning how 10 CFR Part 72 licensees, and in particular specific licensees and general licensees, should implement the proposed rules. The commenters also suggested renumbering of certain sections of the guidance and pointed out possible typographical errors.

Response: All comments were reviewed and considered by the agency in preparing Revision 1 to NUREG-1757, Volume 3 to accompany this final rule. Additional sections have been added to the guidance document for the Part 72 licensees.

J. OMB Supporting Statement

In comments on the OMB Supporting Statement submitted to OMB, NEI argued that NRC's justification for imposing new information collection requirements was flawed because the proposed rule, including the information collection requirements, was designed to address problems that no longer existed because of intervening regulatory developments. In addition, NRC enforcement and oversight could address any problems more efficiently. Secondly, NEI argued that the proposed information collection and recordkeeping requirements are not justified because current reporting and recordkeeping requirements are adequate, and any necessary clarification can be achieved in a less burdensome manner. NEI therefore concluded that the requirements of the Paperwork Reduction Act were not met because the required balancing of the burden against the need for the information showed that the burden was excessive. NEI argued that the estimate of the burden did not adequately include costs of new equipment, physical containment barriers, procedures, and training, which it suggested might total as much as $500 thousand to $1 million per nuclear power reactor. NEI did not agree with the NRC's conclusion that the voluntary implementation of the nuclear industry's GPI will make it unnecessary for nuclear power reactors to take any additional significant steps to comply with the reporting and recordkeeping requirements of these rules.

In comments on the January 2008 proposed rules, the NEI again addressed only the reporting and recordkeeping requirements associated with 10 CFR 20.1406 and 20.1501. NEI noted that the estimate for the burden for Part 50 implementation of those two provisions was zero. NEI then essentially summarized its previous comments on the OMB Supporting Statement, although it also addressed in the same comment proposed implementing guidance. NEI argued that the burden estimate in the supporting statement for implementation of the Part 20 requirements by nuclear power reactors was "grossly inaccurate" because as "an industry, nuclear power plants have spent thousands of person hours and millions of dollars implementing the Industry Groundwater Protection Initiative. Given that the GPI is a voluntary effort and, to some degree, adopts a more graded approach to reevaluation of a site's hydrogeology, as an example, the amount of time and resources necessary to implement the proposed rule using the draft guidance are significantly greater than zero hours."

Response: The NRC, after careful consideration of the comments, has concluded that the commenters are correct that the time certain licensees will need to spend to determine whether a particular facility is affected by the final rule's Part 20 regulations should have been included as part of the paperwork burden. Therefore, the burden estimate has been increased significantly for new § 20.1406(c) and amended § 20.1501(a) to account for the time necessary to read the regulations, determine their impact, if any, on the licensee, and prepare a record of this activity. NRC, however, does not agree with the commenter that time and other resources used to implement the preexisting voluntary industry ground water initiative are properly attributable as reporting or recordkeeping burden for this rule. Although the NRC received no public comments on the reporting and recordkeeping requirements in the proposed rule for 10 CFR Parts 30, 40, 70, or 72, it has reviewed all of those provisions and in a few instances increased the burden estimates for particular sections of those rules. Finally, the NRC has

added an estimate of the burden for 10 CFR Part 50 licensees of changes to the financial test requirements in 10 CFR Part 30, which are cross referenced in 10 CFR 50.75.

K. Agreement State Compatibility

Two comments were received on the Agreement State Compatibility table published with the Decommissioning Planning proposed rule. One of the commenters, an organization representing multiple states, stated that it had no issues with the compatibility designations in the proposed rule. Another commenter stated that the Compatibility Table for the final rule should be expanded to include 10 CFR 20.1401 and 20.1402, and that these sections should be assigned Agreement State Compatibility Category B instead of the existing Category C. The commenter believes this change is needed to eliminate inconsistency in regulatory approach in the Agreement States. The commenter believes that some states, using the Compatibility Category C guideline to adopt NRC "essential objectives," are regulating site termination and release under schemes that are unreasonable and impractical, resulting in excessive burden on licensees without measurable benefit to the public or the environment.

Response: The commenter is correct that 10 CFR 20.1401 and 20.1402 are both assigned Compatibility Category C. But those two sections were not included in the technical basis supporting the Decommissioning Planning proposed rule, and no changes to these regulations were proposed. The NRC does not have a technical basis to support a Compatibility Category change for these regulations, and the change request is outside the scope of this rulemaking. Accordingly, the NRC is making no change in this final rule to the compatibility designations for 10 CFR 20.1401 and 20.1402.

IV. Discussion of Final Amendments by Section

Section 20.1403 Criteria for license termination under restricted conditions.

This rulemaking amends § 20.1403(c)(1) to require financial assurance funds to be placed into a trust segregated from the licensee's assets and outside the licensee's administrative control, and eliminates the licensee's option to use other prepayment financial mechanisms, such as the escrow account, government fund, certificate of deposit, or deposit of government securities. This subsection is further amended to require that the initial amount of the trust fund established for long-term care and maintenance be based on a conservative assumption of a 1 percent annual real rate of return on investment.

The current § 20.1403(c)(2) is deleted to remove the licensee's option to use a surety method, insurance, or other guarantee method to provide financial assurance for a restricted release site. The provisions for government entities to provide financial assurance for long term control and maintenance contained in existing § 20.1403(c)(3) and (4) is retained but redesignated as § 20.1403(c)(2) and (3).

Section 20.1404 Alternate criteria for license termination.

This rulemaking adds a new § 20.1404(a)(5) specifying a fifth criterion that the NRC must consider in determining whether to terminate a license under alternate site release criteria. This new fifth criterion pertains to whether the licensee has provided sufficient financial assurance in the form of a trust fund to enable an independent third party, including a government custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site.

Section 20.1406 Minimization of contamination.

This rulemaking adds a new § 20.1406(c) to require licensees, to the extent practical, to conduct operations to minimize the introduction of residual radioactivity into the site, including

the subsurface. The term "residual radioactivity," defined in 10 CFR Part 20, identifies the type and scope of radioactive material that must be considered by licensees to effectively plan for decommissioning activities during facility operations. The term includes licensed and unlicensed radioactive material.

Section 20.1501 General.

This rulemaking amends § 20.1501(a) to specify that licensee survey requirements include consideration of residual radioactivity, conforming to the new § 20.1406(c). The linkage between new § 20.1406(c) and amended § 20.1501(a) requires that surveys be performed if there is reason to believe that significant subsurface contamination is present which constitutes a potential radiological hazard.

This rulemaking adds a new § 20.1501(b) to require licensees to maintain records from surveys describing the location and amount of subsurface residual radioactivity identified at the site with records important for decommissioning. Existing § 20.1501(b) has been redesignated as paragraph (c), and existing § 20.1501(c) has been redesignated as paragraph (d).

Section 30.34 Terms and conditions of licenses.

Existing § 30.34(b) has been redesignated as paragraph (b)(1) and a new paragraph (b)(2) has been added to require that an application for license transfer must include the proposed transferee's identity, its technical and financial qualifications, and a showing that it will be able to provide adequate financial assurance for decommissioning.

Existing § 40.46 and § 70.36 contain parallel provisions to those in § 30.34(b). Sections 40.46 and 70.36 have been redesignated as § 40.46(a) and § 70.36(a), respectively. New § 40.46(b) and § 70.36(b) parallel the new § 30.34(b)(2) provisions described previously.

Section 30.35 Financial assurance and recordkeeping for decommissioning.

A new paragraph (c)(6) has been added to 10 CFR 30.35 [and parallel § 40.36(c)(5) and § 70.25(c)(5)], to reflect the changes being made to the § 20.1501(a) survey requirements. If these surveys detect residual radioactivity at a site at levels that would, if left uncorrected, prevent the site from meeting the § 20.1402 criteria for unrestricted use, the licensee must submit a DFP within one year of when the survey is complete.

Existing § 30.35(e) [and in parallel § 40.36(d)(1) and (d)(2), Part 40 appendix A, § 70.25(e)(1) and (e)(2), and § 72.30(b) and (c)] have been amended to contain new paragraphs (e)(1) and (e)(2). Section 30.35(e)(1) requires that each DFP submitted for review and approval must contain a DCE based on three cost components. Two of the cost components (a dollar amount adequate to cover the cost of an independent contractor to perform all decommissioning activities, and an adequate contingency factor) are described in existing guidance. The new cost component is an estimate of the volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the decommissioning criteria. Additionally, the DCE must be based on the cost of meeting the § 20.1402 criteria for unrestricted use unless it can be adequately shown that the requirements of § 20.1403 will be met.

A new provision, § 30.35(e)(1)(ii), requires the licensee to identify and justify the basis for all key assumptions underlying the DCE.

Section 30.35(e)(1)(iii) retains the existing § 30.35(e) provision requiring a description of the method of assuring funds for decommissioning. Section 30.35(e)(1)(iv) retains the existing § 30.35(e) provision requiring a certification by the licensee that financial assurance for decommissioning has been provided in the amount of the DCE. Section 30.35(e)(1)(v) retains the existing § 30.35(e) requirement that the DFP include “a signed original of the financial instrument” being used to provide financial assurance, if it has not been previously submitted and accepted as the financial instrument to cover the cost estimate for decommissioning.

New § 30.35(e)(2) requires that the DFP be submitted at the time of license renewal, and at intervals not exceeding 3 years with adjustments as necessary to account for changes in costs and the extent of contamination. The updated DFP must specifically consider the effect of the following events on the cost of decommissioning:

- Spills of radioactive material producing additional residual radioactivity in onsite subsurface material;
- Waste inventory increasing above the amount previously estimated;
- Waste disposal costs increasing above the amount previously estimated;
- Facility modifications;
- Changes in authorized possession limits;
- Actual remediation costs that exceed the previous cost estimate;
- Onsite disposal; and
- Use of a settling pond.

As discussed further in this section, this rulemaking amends the introductory language in 10 CFR 30.35(f), and amends paragraphs (f)(1) through (f)(3). Parallel changes have been made in § 40.36(e), § 40.36(e)(1), (e)(2) and (e)(3), § 70.25(f), § 70.25(f)(1), (f)(2) and (f)(3), § 72.30(e), § 72.30(e)(1), (e)(2) and (e)(3).

Section 30.35(f) is amended to require that the financial instrument used for decommissioning funding assurance include the licensee's name, license number, and docket number, and the name, address, and other contact information of the issuer, and, if a trust is used, the trustee. If there are any changes to this information, the licensee must submit financial instruments reflecting these changes within 30 days.

Section 30.35(f)(1) is amended to require that the prepayment financial method be in the form of a trust. This parallels the rule text change in § 20.1403, eliminating the four other

prepayment mechanisms (i.e., the escrow account, government fund, certificate of deposit, and deposit of government securities).

Section 30.35(f)(2) is amended to eliminate the existing line of credit option as a guarantee method for financial assurance.

Section 30.35(f)(3) is amended to require an external sinking fund to be in the form of a trust, eliminating the escrow account, government fund, certificate of deposit, and deposit of government securities because of their relative risk of loss during bankruptcy.

Section 30.35(h) has been added [and in parallel new § 40.36(f) and § 70.25(h)] specifying that each licensee must use its financial assurance funds only for decommissioning activities. The new section also requires monitoring by the licensee of its investment balance in the decommissioning trust account. Conservative investments are expected in the trust account. If the investment balance in the trust account is below the estimated cost of decommissioning, but is not below 75 percent of the cost, then the licensee must, within 30 days after the end of the calendar quarter, deposit funds into the trust account to fully cover the estimated cost. If at any time the loss results in a balance that is below 75 percent of the amount necessary to cover the decommissioning cost, the licensee must, within 30 days of such occurrence, deposit funds into the trust account to fully cover the estimated cost. The licensee must report taking such actions to the NRC within 30 days of the occurrence.

Part 30 Appendices A, C, D, and E.

This rulemaking makes a set of parallel amendments to 10 CFR Part 30, appendices A, C, D, and E. The types of guarantors for which the financial tests in these appendices apply are:

- Appendix A, Parent company guarantees;
- Appendix C, Self-guarantees;

- Appendix D, Self-guarantees by companies that have no rated commercial bonds;
- Appendix E, Self-guarantees by non-profit colleges, universities and hospitals.

In the financial test in Section II.A in appendices A, C, and D of Part 30, this rulemaking adds language to allow the inclusion of intangible assets in the determination of net worth. Net worth is defined to exclude the net book value and goodwill of the nuclear facility and site. Tangible net worth is defined to exclude all intangible assets and the net book value of the nuclear facility and site. In appendix A, Section II.A.2.(ii) has been revised to require the licensee to perform a net worth calculation instead of a tangible net worth calculation.

In the financial test in Section II.A in appendices A, C, and D of Part 30, this rulemaking requires that the guarantor's tangible net worth be at least $ 21 million to pass one of the criteria for that financial test.

Each set of changes to Appendices A, C, D, and E of Part 30 requires the independent CPA (who compares the data used in the financial tests against data in year-end financial statements) to evaluate the guarantor's off-balance sheet transactions regarding the impact these transactions may have on the guarantor's ability to pay decommissioning costs. The CPA also must verify bond ratings if these are used to pass the financial test.

For those licensees or guarantors that issue bonds and use the financial test under Section II.B of appendices A, C, and E of Part 30, this rulemaking specifies that the current rating of the most recent bond issuance of AAA, AA, or A by Standard and Poor's could include adjustments of + or - (i.e., AAA+, AA+, or A+ and AAA-, AA-, and A- would meet the criterion) and the current rating of Aaa, Aa, or A by Moody's could include adjustments of 1, 2, or 3. In each of these appendices, this rulemaking also requires the bond to be the most recent "uninsured, uncollateralized, and unencumbered" bond issuance.

In each appendix A, C, D, and E of Part 30, this rulemaking makes changes to the 90 day test to show continued eligibility for the licensee and guarantor.

In each appendix A, C, D, and E to Part 30, this rulemaking amends Section III to clarify that the guarantor is required to set up a standby trust, with new criteria for selecting an acceptable trustee.

In appendix A to Part 30, this rulemaking amends section III to require that the parent company guarantor agree to make itself subject to Commission orders (e.g., order to make payments under the guarantee agreement). The parent company guarantor also must agree to make itself jointly and severally liable with the licensee for the full cost of decommissioning with any additional costs not paid by the licensee to be paid by the parent company guarantor.

In each appendix A, C, D, and E to Part 30, this rulemaking amends Section III to allow the Commission, in cases of the guarantor company's financial distress, to declare the financial assurance guaranteed by the guarantor to be immediately due and payable to the standby trust. The guarantor companies also are required to notify the NRC, in writing, immediately following the occurrence of events signifying financial distress.

Section 40.36 Financial assurance and recordkeeping for decommissioning.

This rulemaking amends § 40.36(c)(5) in changes that are parallel to those described under § 30.35(c)(6); amends § 40.36(d)(1) and (d)(2) in changes that are parallel to those described under § 30.35(e)(1) and (e)(2); amends § 40.36(e) in changes that are parallel to those described under § 30.35(f); and amends § 40.36(f) in changes that are parallel to those described under § 30.35(h).

Section 40.46 Inalienability of licenses.

This rulemaking amends § 40.46. The changes are described under the section for § 30.34.

Part 40 Appendix A.

This rulemaking amends appendix A, Criterion 9, to Part 40. For the most part, the changes are parallel to those described under § 30.35(e)(1) and § 30.35(e)(2). However, two errors contained in the proposed published amendments to Criterion 9 are being corrected. First, in proposed Criterion 9(b)(2) – relating to financial surety arrangements that uranium recovery licensees must establish – the term “residual radioactive material” was used in describing one of the items that a Commission-approved cost estimate must contain. This term, as defined in existing 10 CFR 40.4, applies only to uranium mill sites that were inactive (so-called Title I sites) as of 1978 when the Uranium Mill Tailings Radiation Control Act was enacted. To avoid confusion, the proposed use of "residual radioactive material" is replaced by the phrase "radioactive contamination" in Criterion 9(b)(2). Second, in proposed Criterion 9(f)(4) – relating to required adjustments in surety liability amounts – the term "residual radioactivity" was used in conjunction with the phrase "license termination criteria." Such a juxtaposition is appropriate for 10 CFR Part 30 licensees and most others. But pursuant to 10 CFR 20.1401(a), the scope of 10 CFR Part 20 subpart E, "Radiological Criteria for License Termination," does not include facilities subject to Part 40 appendix A, which contains its own set of provisions governing the long term control and remediation of tailings and associated contaminants. Accordingly, in Criterion 9(f)(4), the term "residual radioactivity" is replaced by the word "contamination"; and the phrase "license termination criteria" is replaced by the phrase "applicable remediation criteria."

Section 50.75 Reporting and recordkeeping for decommissioning planning.

This rulemaking eliminates the line of credit in § 50.75(e)(1)(iii)(A) as a guarantee method for financial assurance. Additionally, in the parallel provisions of § 50.75(f)(1) and (f)(2), in each paragraph between its second and third sentences, the following additional sentence is

added: "If any of the preceding items is not applicable, the licensee should so state in its report." This change clarifies that not all listed items in § 50.75(f)(1) and (f)(2) are applicable to all reactor licensees, and resolves an issue raised in a recent NRC audit of decommissioning funding assurance requirements. The NRC is also making minor editorial and clarifying changes in § 50.75(f)(1) and (f)(2) that impose no additional requirements, and are not substantive modifications.

Section 50.82 Termination of license.

This rulemaking revises § 50.82(a)(4)(i) to require that additional details be included in the PSDAR. The PSDAR must now include a description of the planned decommissioning activities, a schedule for their accomplishment, and an estimate of expected costs. As revised, this regulation will now also require that the PSDAR cost estimates include those for managing irradiated fuel.

This rulemaking also adds paragraphs (v) through (vii) to existing § 50.82(a)(8). New paragraph (a)(8)(v) requires that a power reactor licensee, that has submitted its certification of permanent cessation of operation, must report annually on the status of its radiological decommissioning funding on a calendar-year basis.

New paragraph (a)(8)(vi) requires that if funds reported in the financial assurance status report are below the estimated cost to complete the decommissioning, the licensee must include additional financial assurance to make up the difference.

New paragraph (a)(8)(vii) requires an annual report on the status of funds for managing irradiated fuel. This report includes the accumulated amount, the projected costs until title to the fuel is transferred to the Secretary of Energy, and the plan to obtain the necessary additional funds if the total projected cost is higher than the accumulated amount.

Section 70.25 Financial assurance and recordkeeping for decommissioning.

This rulemaking amends § 70.25. The changes are parallel to those described under § 30.35.

Section 70.36 Inalienability of licenses.

This rulemaking amends § 70.36. The changes are parallel to those described under § 30.34.

Section 72.13 Applicability.

As stated in the January 2008 notice for the proposed rule, references in § 72.13(c) to § 72.30 are being changed to conform with the revisions to § 72.30, whereby § 72.30(c) is being re-designated as § 72.30(e), and § 72.30(d) is being re-designated as § 72.30(f). This reflects the fact that existing 10 CFR 72.13(c) references 10 CFR 72.30(c) and (d).

However, the January 2008 notice's discussion of proposed changes in the cross-referencing provisions of § 72.13 did not capture all of the proposed changes to 10 CFR 72.30 (i.e., the revisions to 10 CFR 72.30(b), and the addition of new subsections (c), (d), and (g) to 10 CFR 72.30). Section 72.13(b) references the Part 72 provisions applicable to those holding Part 72 specific licenses, and 10 CFR 72.13(c) references the Part 72 provisions applicable to those holding Part 72 general licenses. Thus, any amendments to 10 CFR 72.30 need to be reflected in 10 CFR 72.13. An expanded discussion of the changes in the cross-referencing provisions of § 72.13 is set forth below (a more detailed discussion of these and related issues appears in the response to comment H.25 above).

As stated above, existing 10 CFR 72.13(c) references 10 CFR 72.30(d). Thus, those holding Part 72 general licenses are already subject to all of the existing 10 CFR 72.30(d) requirements. Such requirements include the decommissioning funding plan (DFP) provisions

referenced in 10 CFR 72.30(d)(4) – which this rulemaking re-designates as 10 CFR 72.30(f)(4). The new provisions in 10 CFR 72.30(b) provide further details of what initial DFPs must include. New subsection (c) of 10 CFR 72.30 presents a set of timing provisions describing when updated DFPs must be submitted for NRC approval. New subsection (d) of 10 CFR 72.30 is a special 1-year DFP update provision based on 10 CFR 20.1501 survey results. Together, these new DFP requirements, along with the 10 CFR 72.30(f)(4) DFP provisions, will be referenced in 10 CFR 72.13(c), and will thus be applicable to Part 72 general licensees.

Accordingly, the final rulemaking amends 10 CFR 72.13(c) so that it correctly includes references 10 CFR 72.30(b), (c), (d), (e), and (f) that are applicable to holders of Part 72 general licenses.

The requirements of new 10 CFR 72.30(g) – under which licensees must replenish fund levels if decommissioning funds fall below specified levels – are unlike the above-referenced DFP requirements in that no similar provisions now exist in either Part 72 or Part 50. Aside from requirements listed in 10 CFR 72.13(c), a Part 72 general licensee can only be subject to requirements that a Part 50 licensee is subject to. Thus, the new 10 CFR 72.30(g) requirements will be applicable only to holders of Part 72 specific licenses. No amendment to 10 CFR 72.13(b) is necessary to reflect this, because existing 10 CFR 72.13(b) lists "72.16 through 72.34" as being among the part 72 requirements that are applicable to specific licenses.

Section 72.30 Financial assurance and recordkeeping for decommissioning.

This rulemaking amends § 72.30. The changes are similar to those described under § 30.35(e), and two existing paragraphs are redesignated.

Additionally, the NRC is amending the newly redesignated § 72.30(e)(5) – formerly § 72.30(c)(5) – to allow a licensee, who is also an electric utility as defined in 10 CFR Part 50, to continue to rely on Part 50 mechanisms for decommissioning financial assurance. In the event

that funds remaining to be placed into the licensee's ISFSI decommissioning external sinking fund are no longer approved for recovery in rates by a competent rate making authority, the licensee must make changes to provide financial assurance using the methods in 10 CFR 72.30(e). This change was not noticed in the January 2008 proposed rule. It is being made as a result of a public comment on the proposed rule, regarding acceptable mechanisms in providing decommissioning financial assurance under § 72.30(e). The commenter noted that it and another licensee, each with Part 72 specific licenses, were granted in 2005 exemptions from 10 CFR 72.30(c)(5) – now 72.30(e)(5) -- allowing them to continue to use 10 CFR 50.75(e)(1)(ii)(A) as the exclusive mechanism for ISFSI decommissioning financial assurance. This rulemaking change in § 72.30(e)(5) provides adequate financial assurance for decommissioning an ISFSI, and will improve regulatory efficiency and effectiveness by allowing ISFSI licensees who are also an electric utility to continue their use of the Part 50 sinking fund applied to ISFSI decommissioning after the power reactor has been decommissioned.

The NRC in this rulemaking is amending the newly redesignated § 72.30(f)(4) to remove the reference to "the amount certified for decommissioning" which occurs in the existing regulation, under § 72.30(d)(4). Part 72 does not have provisions for an ISFSI licensee to certify to a prescribed amount of financial assurance. This rulemaking change is being made as a technical correction.

New § 72.30(g) states that each licensee with a Part 72 specific license must use its financial assurance funds only for decommissioning activities. As discussed above in response to a comment, the NRC in this final rule is revising the proposed section 72.30(g) to require monitoring by the licensee of its investment balance in the decommissioning trust account, on an annual rather than quarterly basis. If, at the end of a calendar year, the investment balance in the trust account is below the estimated cost of decommissioning, but is not below 75 percent of the cost, then licensees must, within 30 days after the end of the calendar year, deposit funds

into the trust account to fully cover the estimated cost. If at any time the loss results in a balance that is below 75 percent of the amount necessary to cover the decommissioning cost, the licensee must, within 30 days of such occurrence, deposit funds into the trust account to fully cover the estimated cost. The licensee must report taking such actions to the NRC within 30 days of the occurrence.

Section 72.50 Transfer of license.

This rulemaking amends § 72.50 by adding a new paragraph (b)(3), requiring that the license transfer application describe the financial assurance that will be provided for the decommissioning under § 72.30.

Section 72.80 Other records and reports.

References in § 72.80(e) and (f) are corrected to conform with the changes to § 72.30, whereby § 72.30(d) would become § 72.30(f).

V. Criminal Penalties

For the purpose of Section 223 of the Atomic Energy Act (AEA), the Commission is amending 10 CFR Parts 20, 30, 40, 50, 70, and 72 under one or more of Sections 161b, 161i, or 161o of the AEA. Willful violations of the rule would be subject to criminal enforcement.

VI. Agreement State Compatibility

Under the "Policy Statement on Adequacy and Compatibility of Agreement State Programs" approved by the Commission on June 30, 1997, and published in the *Federal Register* on September 3, 1997 (62 FR 46517), this final rule is a matter of compatibility

between the NRC and the Agreement States, thereby providing consistency among the Agreement States and the NRC requirements. The NRC staff analyzed the final rule in accordance with the procedure established within Part III, "Categorization Process for NRC Program Elements," of Handbook 5.9 to Management Directive 5.9, "Adequacy and Compatibility of Agreement State Programs" (a copy of which may be viewed at http://www.nrc.gov/reading-rm/doc-collections/management-directives/).

NRC program elements (including regulations) are placed into four compatibility categories (See the Compatibility Table in this section). In addition, the NRC program elements also can be identified as having particular health and safety significance or as being reserved solely to the NRC. Compatibility Category A establishes program elements that are basic radiation protection standards and scientific terms and definitions that are necessary to understand radiation protection concepts. An Agreement State should adopt Category A program elements in an essentially identical manner to provide uniformity in the regulation of agreement material on a nationwide basis. Compatibility Category B establishes program elements that apply to activities that have direct and significant effects in multiple jurisdictions. An Agreement State should adopt Category B program elements in an essentially identical manner. Compatibility Category C establishes program elements that do not meet the criteria of Category A or B, but the essential objectives of which an Agreement State should adopt to avoid conflict, duplication, gaps, or other conditions that would jeopardize an orderly pattern in the regulation of agreement material on a nationwide basis. An Agreement State should adopt the essential objectives of the Category C program elements. Compatibility Category D establishes program elements that do not meet any of the criteria of Category A, B, or C, above, and, thus, do not need to be adopted by Agreement States for purposes of compatibility.

Health and Safety (H&S) are program elements that are not required for compatibility but are identified as having a particular health and safety role (i.e., adequacy) in the regulation of

agreement material within the State. Although not required for compatibility, the State should adopt program elements in this H&S category based on those of the NRC that embody the essential objectives of the NRC program elements, because of particular health and safety considerations. Compatibility Category NRC establishes program elements that address areas of regulation that cannot be relinquished to Agreement States under the Atomic Energy Act, as amended, or provisions of Title 10 of the Code of Federal Regulations. These program elements are not adopted by Agreement States.

The following table lists the parts and sections that have been added or revised by this final rule and their corresponding categorization under the "Policy Statement on Adequacy and Compatibility of Agreement State Programs."

Compatibility Table for Decommissioning Planning final rule

Section	Change	Subject	Compatibility	
			Existing	New*
20.1403(c)(1)	Amend	Trust fund for restricted use	C	C
20.1403(c)(2)	Deleted	Acceptable financial assurance methods	C	C
20.1403(c)(3) & (4)	Redesignated	Government entity financial assurance	C	C
20.1404(a)(5)	Add	Trust fund for alternate criteria	-	C
20.1406(c)	Add	Minimize residual radioactivity	-	C
20.1501(a)	Amend	Surveys and monitoring	H&S	H&S
20.1501(b)	Add	Records from surveys	-	H&S
30.34(b)(1)	Redesignated	License transfer requirements	C	C
30.34(b)(2)	Add	License transfer requirements	-	C
30.35(c)(6)	Add	Assess subsurface contamination	-	D
30.35(d)	No change	Certification amounts financial assurance	H&S**	D
30.35(e)(1)	Amend	Contents of decommissioning funding plan	D***	H&S
30.35(e)(2)	Amend	Updates of decommissioning funding plan	D***	H&S
30.35(f)	Amend	Methods for financial assurance	D	D
30.35(h)	Add	Monitor the balance of funds	-	D
30 Appendix A	Amend	Parent company guarantee	D	D
30 Appendix C	Amend	Self-guarantee with bonds	D	D
30 Appendix D	Amend	Self-guarantee without bonds	D	D
30 Appendix E	Amend	Self-guarantee nonprofits	D	D
40.36(c)(5)	Add	Assess subsurface contamination	-	D
40.36(d)(1)	Amend	Contents of decommissioning funding plan	H&S	H&S
40.36(d)(2)	Amend	Updates of decommissioning funding plan	H&S	H&S
40.36(e)	Amend	Methods for financial assurance	D	D
40.36(g)	Add	Monitor the balance of funds	-	D
40.46(a)	Redesignated	License transfer requirements	C	C
40.46(b)	Add	License transfer information requirements	-	C
40 Appendix A Criterion 9(b)	Amend	DCEs and financial surety [with 11e.(2)]	C	C
40 Appendix A Criterion 9(b)	Amend	DCEs and financial surety [without 11e.(2)]	NRC	NRC
50.75(e) & (f)	Amend	Surety and reporting of status of funding	NRC	NRC
50.82(a)(4)	Amend	Cost information in the PSDAR	NRC	NRC
50.82(a)(8)(v), (vi) & (vii)	Add	Cost information in the annual financial assurance status report	-	NRC
70.25(c)(5)	Add	Assess subsurface contamination	-	D
70.25(d)	No change	Certification amounts financial assurance	H&S**	D
70.25(e)(1)	Amend	Contents of decommissioning funding plan	D***	H&S
70.25(e)(2)	Amend	Updates of decommissioning funding plan	D***	H&S
70.25(f)	Amend	Methods for financial assurance	D	D
70.25(h)	Add	Monitor the balance of funds	-	D
70.36(b)	Add	License transfer requirements	-	C
72.13 & 72.30(b)	Amend	Applicability and contents of funding plan	NRC	NRC
72.30(c)	Add	Updates of decommissioning funding plan	-	NRC
72.30(d)	Add	Assess subsurface contamination	-	NRC
72.30(e)	Amend	Methods for financial assurance	NRC	NRC
72.30(g)	Add	Monitor the balance of funds	-	NRC
72.50(b)(3) & 72.80	Add	License transfer and other records	-	NRC

* final rule compatibility category
** The compatibility category for § 30.35(d) and § 70.25(d) were incorrectly specified in the 68 FR 57334, October 3, 2003, Financial Assurance for Materials Licensees final rule. The correct category for both of these sections is D.
*** The compatibility category for § 30.35(e) and § 70.25(e) were incorrectly specified in the 68 FR 57334, October 3, 2003, Financial Assurance for Materials Licensees final rule. The correct category for both of these sections is H&S.

VII. Voluntary Consensus Standards

The National Technology Transfer and Advancement Act of 1995, Pub. L. 104-113, requires that Federal agencies use technical standards developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. There are no consensus standards regarding acceptable methods for radiological surveys across a broad spectrum of licensed facilities, or for preparing DCEs or providing financial assurance for decommissioning that would apply to the requirements imposed by this final rule. Thus, the provisions of the Act do not apply to this rule.

VIII. Environmental Assessment and Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, that this rule is not a major Federal action significantly affecting the quality of the human environment and therefore an environmental impact statement is not required. The Commission has prepared an environmental assessment for this final rule.

The amendments in this final rule require licensees, to the extent practical, to conduct their operations to minimize the introduction of residual radioactivity into the site, particularly in the subsurface soil and ground water. There are a variety of monitoring methods to evaluate subsurface characteristics, and these are highly site specific with respect to their effectiveness. One or more licensees may find that compliance with the amendments will mean the installation of ground water monitoring wells and surface monitoring devices at their sites. The installation

of these monitoring devices and wells is generally expected to result in small environmental impacts due to their very localized nature.

During sampling and testing, the amendments introduce the potential for a small amount of increased occupational exposures. These exposures are expected to remain within 10 CFR Part 20 limits and to be ALARA. If subsurface contamination is detected, licensees may choose to remediate when contamination levels are lower and more manageable, which could result in reduced future occupational exposure rates than if the contamination conditions were allowed to remain and become increasingly more hazardous. Licensees may alternatively choose to provide adequate funding in response to their knowledge of the extent of any subsurface contamination, which will better ensure that the area is remediated following decommissioning to a degree that supports public health and safety, and protection of the environment.

If significant onsite residual radioactivity in the subsurface is found due to the monitoring imposed by these amendments, such knowledge will better ensure the protection of public health and safety, and protection of the environment. Identifying and resolving the source of the contamination will better ensure that waste is not allowed to migrate offsite. Early identification also provides more time to plan waste remediation strategies that are both safe and cost effective. The effect of the amendments is anticipated to be beneficial to the environment, and it is expected that the overall environmental impacts will be positive.

Therefore, the determination of the environmental assessment is that there will be no significant impact to the human environment from this action.

This conclusion was published in the environmental assessment that was posted to the NRC rulemaking website: http://www.regulations.gov for 75 days after publication of the proposed rule. Two comments were received on the content of the environmental assessment. These comments did not change the conclusion of the environmental assessment. These comments are discussed in Section III.D of this rule.

IX. Paperwork Reduction Act Statement

This final rule imposes new or amended information collection requirements contained in 10 CFR Parts 20, 30, 40, 50, 70, and 72, that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq*.). These requirements were approved by the Office of Management and Budget, approval numbers 3150-0014, -0017, -0020, -0011, -0009, and –0132.

The burden to the public for these information collections is estimated to average 12 hours per response. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments on any aspect of these information collections, including suggestions for reducing the burden, to the Records and FOIA/Privacy Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to INFOCOLLECTS.resource@nrc.gov; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0011), Office of Management and Budget, Washington, DC 20503 or by Internet electronic mail to Nathan J. Frey@omb.eop.gov.

Public Protection Notice

The NRC may not conduct or sponsor, and a person is not required to respond to a request for information for an information collection requirement unless the requesting document displays a currently valid OMB control number.

X. Regulatory Analysis

As part of this final rulemaking, the Commission has prepared a regulatory analysis examining the costs and benefits of the rulemaking and alternatives considered by the Commission.

The regulatory analysis was performed over a 15 year analysis period using 2007 dollars. The implementation of the final rule by industry, NRC and Agreement States is estimated to cost about $44 million, over the 15 year analysis period at a 3 percent discount rate. NRC licensee costs are about $6 million, and NRC costs are about $3 million. Agreement State licensee costs are about $22 million, and Agreement State costs are about $12 million. Virtually all of the industry costs are due to changes to 10 CFR Parts 20 and 30.

The regulatory analysis is available for inspection in the NRC Public Document Room, 11555 Rockville Pike, Rockville, MD, and may be downloaded from the NRC rulemaking website at www.regulations.gov. Single copies of the regulatory analysis are available from Kevin O'Sullivan, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-8112, e-mail Kevin.OSullivan@nrc.gov.

XI. Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the Commission certifies that this rule will not have a significant economic impact on a substantial number of small entities. Only about 300 NRC materials licensees are required to have decommissioning financial assurance and the large majority of these organizations do not fall within the scope of the definition of "small entities" set forth in the Regulatory Flexibility Act or

the Small Business Size Standards set out in regulations issued by the Small Business Administration at 13 CFR Part 121. Based on the regulatory analysis, the NRC believes that the amendments in this final rule are the least burdensome, most flexible alternative that would accomplish the NRC's regulatory objective.

XII. Backfit Analysis

As discussed more fully in the regulatory analysis, the NRC has determined that the NRC's backfitting rules at issue here (10 CFR 50.109, 70.76, and 72.62) do not require the preparation of a backfit analysis for this rulemaking. A backfit is the modification of equipment or procedures required to operate a facility resulting from new or amended NRC regulations, or the imposition of a regulatory staff position interpreting the Commission rules that is either new or different from a previously applicable staff position.

The new or amended regulations in this final rule either clarify existing requirements, or require the collection and reporting of information using existing equipment and procedures, or are administrative matters outside the scope of the backfitting rules. The amended survey and monitoring requirements in Part 20 of this rulemaking do not constitute a backfit because they are information collection requirements to support licensee and NRC decisions on decommissioning planning and related activities. The decommissioning financial assurance requirements being amended in Parts 30, 40, 50, 70, and 72 of this rulemaking do not entail modifying any equipment or procedures required to operate the types of NRC-licensed facilities covered by the backfitting rules. These regulatory changes concern administrative matters and are not backfits. Therefore, as discussed further below, the NRC finds that preparation of a backfit analysis is not required for this rulemaking.

In part, this rulemaking amends 10 CFR 20.1406 and 20.1501. Section 20.1406, "Minimization of contamination," is amended by adding a new subsection (c) to read as follows:

> (c) Licensees shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the existing radiation protection requirements in Subpart B and radiological criteria for license termination in Subpart E of this part.

This is not a backfit because it clarifies licensee requirements under existing regulations applicable to licensed operations. The current § 20.1101(a) requires each licensee to implement a radiation protection program to ensure compliance with the regulations in 10 CFR Part 20. The current § 20.1101(b) requires each licensee to use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA, during operations and during decommissioning. These operating procedures and controls need to include methods to minimize the introduction of residual radioactivity into the site, including the subsurface, during active facility operations to achieve doses that are ALARA. Otherwise, licensees will lack a substantive basis to demonstrate that they have achieved, during the life cycle of the facility (which includes decommissioning), public and occupational exposures that are ALARA. The concept of reducing residual radioactivity to ALARA levels as part of the decommissioning criteria has been a position of the NRC since at least 1994 (NUREG-1501, page iii). Licensees should already have these procedures in place as part of their radiation protection program, and 10 CFR 20.1406(c) clarifies this requirement.

As stated above, this rulemaking also amends 10 CFR 20.1501, “General” (part of Subpart F, "Surveys and Monitoring"). Section 20.1501 is amended by revising subsection (a), and inserting a new subsection (b), to read as follows:

(a) Each licensee shall make or cause to be made, surveys of areas, including the subsurface, that--

(1) May be necessary for the licensee to comply with the regulations in this part; and

(2) Are reasonable under the circumstances to evaluate --

(i) The magnitude and extent of radiation levels; and

(ii) Concentrations or quantities of residual radioactivity; and

(iii) The potential radiological hazards of the radiation levels and residual radioactivity detected.

(b) Records from surveys describing the location and amount of subsurface residual radioactivity identified at the site must be kept with records important for decommissioning.

The amended 10 CFR 20.1501(a) replaces the undefined term "radioactive material" with "residual radioactivity," a term already defined in 10 CFR Part 20. As defined in existing 10 CFR 20.1003, residual radioactivity includes subsurface contamination within its scope, and the word "subsurface" is being added to 10 CFR 20.1501(a). The current 10 CFR 20.1501(a)(2)(iii) already requires the evaluation of potential radiological hazards. Thus, as amended, 10 CFR 20.1501(a) makes clear that subsurface residual radioactivity is a potential radiological hazard that is within the scope of these survey requirements. This clarification of existing requirements does not represent a new NRC position and therefore does not fall within the definition of backfitting as set forth in the applicable backfitting regulations.

As set forth above, new paragraph (b) to 10 CFR 20.1501 requires that survey records describing the location and amount of subsurface residual radioactivity identified at a licensed site be kept with records important for decommissioning. NRC licensees are already required to keep records important for decommissioning. See, e.g., 10 CFR 50.75(g), 70.25(g), and

72.30(d). Moreover, the new 10 CFR 20.1501(b) is not intended to require recordkeeping of any and all amounts of subsurface residual radioactivity, but only amounts that are significant to achieve effective decommissioning planning and ALARA dose requirements. Regulatory changes imposing information collection and reporting requirements do not constitute regulatory actions to which the backfit rule applies. New subsection 20.1501(b) and amended section 20.1501(a) contain provisions which require the licensee to perform surveys to collect data on the location and amount of subsurface residual radioactivity that may be a radiological hazard and important for decommissioning planning. Neither of these provisions constitutes a backfit because they are information collection requirements to support licensee and NRC decisions on decommissioning activities.

This rulemaking also revises decommissioning planning and financial assurance requirements in 10 CFR Parts 30, 40, 50, 70 and 72. These revisions do not entail modifying any equipment or procedures required to operate the types of NRC-licensed facilities subject to the backfitting rules. Therefore, preparation of a backfit analysis is not required for the proposed revisions to the decommissioning planning and financial assurance requirements.

Accordingly, the NRC has determined that the final rule's provisions do not constitute backfitting and do not require the preparation of a backfit analysis. The regulatory analysis identifies the benefits and costs of the rulemaking, discusses the voluntary Industry Ground Water Protection Initiative (GPI), and evaluates other options for addressing the identified issues. The regulatory analysis constitutes a "disciplined approach" for evaluating the merits of the final rule and is consistent with the intent of the backfit rule.

XIII. Congressional Review Act

In accordance with the Congressional Review Act of 1996, the NRC has determined that this action is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs of OMB.

List of Subject Terms

10 CFR Part 20

Byproduct material, Criminal penalties, Licensed material, Nuclear materials, Nuclear power plants and reactors, Occupational safety and health, Packaging and containers, Radiation protection, Reporting and recordkeeping requirements, Source material, Special nuclear material, Waste treatment and disposal.

10 CFR Part 30

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

10 CFR Part 40

Criminal penalties, Government contracts, Hazardous materials transportation, Nuclear materials, Reporting and recordkeeping requirements, Source material, Uranium.

10 CFR Part 50

Antitrust, Classified information, Criminal penalties, Fire protection, Intergovernmental relations, Nuclear power plants and reactors, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements.

10 CFR Part 70

Criminal penalties, Hazardous materials transportation, Material control and accounting, Nuclear materials, Packaging and containers, Radiation protection, Reporting and recordkeeping requirements, Scientific equipment, Security measures, Special nuclear material.

10 CFR Part 72

Administrative practice and procedure, Criminal penalties, Manpower training programs, Nuclear materials, Occupational safety and health, Penalties, Radiation protection, Reporting and recordkeeping requirements, Security measures, Spent fuel, Whistleblowing.

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 20, 30, 40, 50, 70, and 72.

PART 20--STANDARDS FOR PROTECTION AGAINST RADIATION

1. The authority citation for Part 20 continues to read as follows:

Authority: Secs. 53, 63, 65, 81, 103, 104, 161, 182, 186, 68 Stat. 930, 933, 935, 936, 937, 948, 953, 955, as amended, sec. 1701, 106 Stat. 2951, 2952, 2953 (42 U.S.C. 2073, 2093, 2095, 2111, 2133, 2134, 2201, 2232, 2236, 2297f), secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); sec. 1704, 112 Stat. 2750 (44

U.S.C. 3504 note), sec. 651(e), Pub. L. 109–58, 119 Stat. 806-810 (42 U.S.C. 2014, 2021, 2021b, 2111).

2. In § 20.1403, paragraph (c)(2) is removed, paragraph (c)(3) is redesignated as paragraph (c)(2), and paragraph (c)(4) is redesignated as paragraph (c)(3), and paragraph (c)(1) is revised to read as follows:

§ 20.1403 Criteria for license termination under restricted conditions.

*****

(c) ***

(1) Funds placed into a trust segregated from the licensee's assets and outside the licensee's administrative control, and in which the adequacy of the trust funds is to be assessed based on an assumed annual 1 percent real rate of return on investment;

*****

3. In § 20.1404, paragraph (a)(5) is added to read as follows:

§ 20.1404 Alternate criteria for license termination.

(a) ***

(5) Has provided sufficient financial assurance in the form of a trust fund to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site.

*****

4. In § 20.1406, paragraph (c) is added to read as follows:

§ 20.1406 Minimization of contamination.

*****

(c) Licensees shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the existing radiation protection requirements in Subpart B and radiological criteria for license termination in Subpart E of this part.

5. In § 20.1501, paragraph (b) is redesignated as paragraph (c), and paragraph (c) is redesignated as paragraph (d), the introductory text of paragraphs (a) and (a)(2), and paragraphs (a)(2)(ii) and (a)(2)(iii) are revised, and a new paragraph (b) is added to read as follows:

§ 20.1501 General.

(a) Each licensee shall make or cause to be made, surveys of areas, including the subsurface, that --

*****

(2) Are reasonable under the circumstances to evaluate --

*****

(ii) Concentrations or quantities of residual radioactivity; and

(iii) The potential radiological hazards of the radiation levels and residual radioactivity detected.

(b) Records from surveys describing the location and amount of subsurface residual radioactivity identified at the site must be kept with records important for decommissioning.

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

6. The authority citation for Part 30 continues to read as follows:

Authority: Secs. 81, 82, 161, 182, 183, 186, 68 Stat. 935, 948, 953, 954, 955, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2111, 2112, 2201, 2232, 2233, 2236, 2282); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note); sec. 651(e), Pub. L. 109-58, 119 Stat. 806-810 (42 U.S.C. 2014, 2021, 2021b, 2111).

Section 30.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 102-486, sec. 2902, 106 Stat. 3123 (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. 955 (42 U.S.C. 2237).

7. In § 30.34, paragraph (b) is redesignated as paragraph (b)(1) and a new paragraph (b)(2) is added to read as follows:

§ 30.34 Terms and conditions of licenses.

*****

(b) ***

(2) An application for transfer of license must include:

(i) The identity, technical and financial qualifications of the proposed transferee; and

(ii) Financial assurance for decommissioning information required by § 30.35.

*****

8. In § 30.35, a new paragraph (c)(6) is added, and paragraph (e), the introductory text in paragraph (f), paragraph (f)(1), the introductory text of paragraph (f)(2) and paragraph (f)(3) are revised, and a new paragraph (h) is added to read as follows:

§ 30.35 Financial assurance and recordkeeping for decommissioning.

*****

(c) ***

(6) If, in surveys made under 10 CFR 20.1501(a), residual radioactivity in the facility and environment, including the subsurface, is detected at levels that would, if left uncorrected, prevent the site from meeting the 10 CFR 20.1402 criteria for unrestricted use, the licensee must submit a decommissioning funding plan within one year of when the survey is completed.

*****

(e)(1) Each decommissioning funding plan must be submitted for review and approval and must contain –

(i) A detailed cost estimate for decommissioning, in an amount reflecting:

(A) The cost of an independent contractor to perform all decommissioning activities;

(B) The cost of meeting the 10 CFR 20.1402 criteria for unrestricted use, provided that, if the applicant or licensee can demonstrate its ability to meet the provisions of 10 CFR 20.1403, the cost estimate may be based on meeting the 10 CFR 20.1403 criteria;

(C) The volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination; and

(D) An adequate contingency factor.

(ii) Identification of and justification for using the key assumptions contained in the DCE;

(iii) A description of the method of assuring funds for decommissioning from paragraph (f) of this section, including means for adjusting cost estimates and associated funding levels periodically over the life of the facility;

(iv) A certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning; and

(v) A signed original of the financial instrument obtained to satisfy the requirements of paragraph (f) of this section (unless a previously submitted and accepted financial instrument continues to cover the cost estimate for decommissioning).

(2) At the time of license renewal and at intervals not to exceed 3 years, the decommissioning funding plan must be resubmitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted downward, this can not be done until the updated decommissioning funding plan is approved. The decommissioning funding plan must update the information submitted with the original or prior approved plan, and must specifically consider the effect of the following events on decommissioning costs:

(i) Spills of radioactive material producing additional residual radioactivity in onsite subsurface material;

(ii) Waste inventory increasing above the amount previously estimated;

(iii) Waste disposal costs increasing above the amount previously estimated;

(iv) Facility modifications;

(v) Changes in authorized possession limits;

(vi) Actual remediation costs that exceed the previous cost estimate;

(vii) Onsite disposal; and

(viii) Use of a settling pond.

(f) The financial instrument must include the licensee's name, license number, and docket number, and the name, address, and other contact information of the issuer, and, if a trust is used, the trustee. When any of the foregoing information changes, the licensee must, within 30 days, submit financial instruments reflecting such changes. The financial instrument submitted must be a signed original or signed original duplicate, except where a copy of the

signed original is specifically permitted. Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) *Prepayment.* Prepayment is the deposit before 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 must be made into a trust account, and the trustee and the trust must be acceptable to the Commission.

(2) *A surety method, insurance, or other guarantee method.* These methods guarantee that decommissioning costs will be paid. A surety method may be in the form of a surety bond, or letter 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. For commercial corporations that issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in appendix C to this part. For commercial companies that do not issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs may be used if the guarantee and test are as contained in appendix D to this part. For nonprofit entities, such as colleges, universities, and nonprofit hospitals, a guarantee of funds by the applicant or licensee may be used if the guarantee and test are as contained in appendix E to this part. Except for an external sinking fund, a parent company guarantee or a guarantee by the applicant or licensee may not be used in combination with any other financial methods used to satisfy the requirements of this section. A guarantee by the applicant or licensee may not be used in any situation where the applicant or licensee has a parent company holding majority control of the voting stock of the company. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

*****

(3) *An external sinking fund in which deposits are made at least annually, coupled with a surety method, insurance, or other guarantee method, 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 must be in the form of a trust. If the other guarantee method is used, no surety or insurance may be combined with the external sinking fund. The surety, insurance, or other guarantee provisions must be as stated in paragraph (f)(2) of this section.

*****

(h) In providing financial assurance under this section, each licensee must use the financial assurance funds only for decommissioning activities and each licensee must monitor the balance of funds held to account for market variations. The licensee must replenish the funds, and report such actions to the NRC, as follows:

(1) If, at the end of a calendar quarter, the fund balance is below the amount necessary to cover the cost of decommissioning, but is not below 75 percent of the cost, the licensee must increase the balance to cover the cost, and must do so within 30 days after the end of the calendar quarter.

(2) If, at any time, the fund balance falls below 75 percent of the amount necessary to cover the cost of decommissioning, the licensee must increase the balance to cover the cost, and must do so within 30 days of the occurrence.

(3) Within 30 days of taking the actions required by paragraph (g)(1) or (g)(2) of this section, the licensee must provide a written report of such actions to the Director, Office of Federal and State Materials and Environmental Management Programs, and state the new balance of the fund.

9. In appendix A to Part 30, Section II, the introductory text of paragraph A, paragraphs A.1.(ii), A.1.(iii), A.2.(i), A.2.(ii), A.2.(iii), B, and C.1. are revised, in Section III paragraphs B, C, and D are revised, and new paragraphs E, F, G, and H are added to read as follows:

Appendix A to Part 30—Criteria Relating to Use of Financial Tests and Parent Company Guarantees for Providing Reasonable Assurance of Funds for Decommissioning

*****

II. ***

A. To pass the financial test, the parent company must meet the criteria of either paragraph A.1 or A.2 of this section. For purposes of applying the appendix A criteria, tangible net worth must be calculated to exclude all intangible assets and the net book value of the nuclear facility and site, and net worth must be calculated to exclude the net book value and goodwill of the nuclear facility and site.

1. ***

(ii) Net working capital and tangible net worth each at least six times the amount of decommissioning funds being assured by a parent company guarantee for the total of all nuclear facilities or parts thereof (or prescribed amount if a certification is used); and

(iii) Tangible net worth of at least $ 21 million; and

*****

2. ***

(i) A current rating for its most recent uninsured, uncollateralized, and unencumbered bond issuance of AAA, AA, A, or BBB (including adjustments of + and -) as issued by Standard and Poor's or Aaa, Aa, A, or Baa (including adjustment of 1, 2, or 3) as issued by Moody's; and

(ii) Net worth at least six times the amount of decommissioning funds being assured by a parent company guarantee for the total of all nuclear facilities or parts thereof (or prescribed amount if a certification is used); and

(iii) Tangible net worth of at least $ 21 million; and

*****

B. The parent company's independent certified public accountant must compare 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. The accountant must evaluate the parent company's off-balance sheet transactions and provide an opinion on whether those transactions could materially adversely affect the parent company's ability to pay for decommissioning costs. The accountant must verify that a bond rating, if used to demonstrate passage of the financial test, meets the requirements of paragraph A of this section. In connection with the auditing procedure, the licensee must 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 annually pass the test and provide documentation of its continued eligibility to use the parent company guarantee to the Commission within 90 days after the close of each succeeding fiscal year.

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III. ***

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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 alternative financial assurance that meets the provisions of the Commission's regulations 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, accepted in writing the parent company's alternate financial assurances, or accepted in writing the licensee's financial assurances.

D. A standby trust to protect public health and safety and the environment must be established for decommissioning costs before the parent company guarantee agreement is submitted. 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, whose trust operations are regulated and examined by a Federal or State agency. The Commission has the right to change the trustee. An acceptable trust will meet the regulatory criteria established in these regulations that govern the issuance of the license for which the guarantor has accepted the obligation to pay for decommissioning costs.

E. The guarantor must agree that it is jointly and severally liable with the licensee for the full cost of decommissioning, and that if the costs of decommissioning and termination of the license exceed the amount guaranteed, the guarantor will pay such additional costs that are not paid by the licensee.

F. The guarantor must agree that it would be subject to Commission orders to make payments under the guarantee agreement.

G. The guarantor must agree that if the guarantor admits in writing its inability to pay its debts generally, or makes a general assignment for the benefit of creditors, or any proceeding is instituted by or against the guarantor seeking to adjudicate it as bankrupt or insolvent, or seeking dissolution, liquidation, winding-up, reorganization, arrangement, adjustment, protection, relief or composition of it or its debts under any law relating to bankruptcy, insolvency, or reorganization or relief of debtors, or seeking the entry of an order for relief or the

appointment of a receiver, trustee, custodian, or other similar official for the guarantor or for any substantial part of its property, or the guarantor takes any action to authorize or effect any of the actions stated in this paragraph, then the Commission may:

1. Declare that the financial assurance guaranteed by the parent company guarantee agreement is immediately due and payable to the standby trust set up to protect the public health and safety and the environment, without diligence, presentment, demand, protest or any other notice of any kind, all of which are expressly waived by guarantor; and

2. Exercise any and all of its other rights under applicable law.

H. 1. The guarantor must agree to notify the NRC, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of title 11 (Bankruptcy) of the United States Code, or the occurrence of any other event listed in paragraph G of this Appendix, by or against:

(i) The guarantor;

(ii) The licensee;

(iii) An entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensee as property of the estate; or

(iv) An affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.

2. This notification must include:

(i) A description of the event, including major creditors, the amounts involved, and the actions taken to assure that the amount of funds guaranteed by the parent company guarantee for decommissioning will be transferred to the standby trust as soon as possible;

(ii) If a petition of bankruptcy was filed, the identity of the bankruptcy court in which the petition for bankruptcy was filed; and

(iii) The date of filing of any petitions.

10. In appendix C to Part 30, in Section II, paragraphs A., B.(2) and B.(3) are revised, in Section III, paragraphs E and F are revised, and paragraphs G, H, and I are added to read as follows:

Appendix C to Part 30—Criteria Relating to Use of Financial Tests and Self Guarantees for Providing Reasonable Assurance of Funds for Decommissioning

*****

II. ***

A. To pass the financial test a company must meet all of the criteria set forth below. For purposes of applying the appendix C criteria, tangible net worth must be calculated to exclude all intangible assets and the net book value of the nuclear facility and site, and net worth must be calculated to exclude the net book value and goodwill of the nuclear facility and site. These criteria include:

(1) Tangible net worth of at least $ 21 million, and net worth at least 10 times the amount of decommissioning funds being assured by a self-guarantee, for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor for the total of all nuclear facilities or parts thereof (or the current amount required if certification is used).

(2) Assets located in the United States amounting to at least 90 percent of total assets or at least 10 times the amount of decommissioning funds being assured by a self-guarantee, for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor for the total of all nuclear facilities or parts thereof (or the current amount required if certification is used).

(3) A current rating for its most recent uninsured, uncollateralized, and unencumbered bond issuance of AAA, AA, or A (including adjustments of + and -) as issued by Standard and Poor's, or Aaa, Aa, or A (including adjustments of 1, 2, or 3) as issued by Moody's.

B.***

(2) The company's independent certified public accountant must compare the data used by the 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. The accountant must evaluate the company's off-balance sheet transactions and provide an opinion on whether those transactions could materially adversely affect the company's ability to pay for decommissioning costs. The accountant must verify that a bond rating, if used to demonstrate passage of the financial test, meets the requirements of Section II paragraph A of this appendix. In connection with the auditing procedure, the licensee must 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.

(3) After the initial financial test, the company must annually pass the test and provide documentation of its continued eligibility to use the self-guarantee to the Commission within 90 days after the close of each succeeding fiscal year.

*****

III. ***

E. (1) If, at any time, the licensee's most recent bond issuance ceases to be rated in any category of ''A-'' and above by Standard and Poor's or in any category of ''A3'' and above by Moody's, the licensee will notify the Commission in writing within 20 days after publication of the change by the rating service.

(2) If the licensee's most recent bond issuance ceases to be rated in any category of A or above by both Standard and Poor's and Moody's, the licensee no longer meets the requirements of Section II.A. of this appendix.

F. The applicant or licensee must provide to the Commission a written guarantee (a written commitment by a corporate officer) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the Commission, the licensee will fund the standby trust in the amount guaranteed by the self-guarantee agreement.

G. (1) A standby trust to protect public health and safety and the environment must be established for decommissioning costs before the self-guarantee agreement is submitted.

(2) 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. The Commission has the right to change the trustee. An acceptable trust will meet the regulatory criteria established in these regulations that govern the issuance of the license for which the guarantor has accepted the obligation to pay for decommissioning costs.

H. The guarantor must agree that if the guarantor admits in writing its inability to pay its debts generally, or makes a general assignment for the benefit of creditors, or any proceeding is instituted by or against the guarantor seeking to adjudicate it as bankrupt or insolvent, or seeking dissolution, liquidation, winding-up, reorganization, arrangement, adjustment, protection, relief or composition of it or its debts under any law relating to bankruptcy, insolvency, or reorganization or relief of debtors, or seeking the entry of an order for relief or the appointment of a receiver, trustee, custodian, or other similar official for the guarantor or for any substantial part of its property, or the guarantor takes any action to authorize or effect any of the actions stated in this paragraph, then the Commission may:

(1) Declare that the financial assurance guaranteed by the parent company guarantee agreement is immediately due and payable to the standby trust set up to protect the public

health and safety and the environment, without diligence, presentment, demand, protest or any other notice of any kind, all of which are expressly waived by guarantor; and

(2) Exercise any and all of its other rights under applicable law.

I. The guarantor must notify the NRC, in writing, immediately following the occurrence of any event listed in paragraph H of this appendix, and must include a description of the event, including major creditors, the amounts involved, and the actions taken to assure that the amount of funds guaranteed by the self-guarantee agreement for decommissioning will be transferred to the standby trust as soon as possible.

11. In appendix D to Part 30 in section II, the introductory text of paragraph A., paragraphs A.(1), B.(1), and B.(2) are revised, in section III paragraph D is revised and paragraphs E, F, and G are added to read as follows:

Appendix D to Part 30—Criteria Relating to Use of Financial Tests and Self-Guarantee for Providing Reasonable Assurance of Funds for Decommissioning by Commercial Companies That Have no Outstanding Rated Bonds

*****

II. ***

A. To pass the financial test a company must meet all of the criteria set forth below. For purposes of applying the appendix D criteria, tangible net worth must be calculated to exclude all intangible assets and the net book value of the nuclear facility and site.

(1) Tangible net worth greater than $ 21 million, and at least 10 times the amount of decommissioning funds being assured by a self-guarantee, whichever is greater, for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor for the total of all nuclear facilities or parts thereof (or the current amount required if certification is used).

*****

B. ***

(1) The company's independent certified public accountant must compare the data used by the 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. The accountant must evaluate the company's off-balance sheet transactions and provide an opinion on whether those transactions could materially adversely affect the company's ability to pay for decommissioning costs. In connection with the auditing procedure, the licensee must 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.

(2) After the initial financial test, the company must annually pass the test and provide documentation of its continued eligibility to use the self-guarantee to the Commission within 90 days after the close of each succeeding fiscal year.

*****

III. ***

D. The applicant or licensee must provide to the Commission a written guarantee (a written commitment by a corporate officer) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the Commission, the licensee will fund the standby trust in the amount of the current cost estimates for decommissioning.

E. A standby trust to protect public health and safety and the environment must be established for decommissioning costs before the self-guarantee agreement is submitted. 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. The Commission will have the right to change the trustee. An acceptable trust will meet the regulatory criteria established in the part of these regulations that governs the issuance of the license for which the guarantor has accepted the obligation to pay for decommissioning costs.

F. The guarantor must agree that if the guarantor admits in writing its inability to pay its debts generally, or makes a general assignment for the benefit of creditors, or any proceeding is instituted by or against the guarantor seeking to adjudicate it as bankrupt or insolvent, or seeking dissolution, liquidation, winding-up, reorganization, arrangement, adjustment, protection, relief or composition of it or its debts under any law relating to bankruptcy, insolvency, or reorganization or relief of debtors, or seeking the entry of an order for relief or the appointment of a receiver, trustee, custodian, or other similar official for the guarantor or for any substantial part of its property, or the guarantor takes any action to authorize or effect any of the actions stated in this paragraph, then the Commission may:

(1) Declare that the financial assurance guaranteed by the self-guarantee agreement is immediately due and payable to the standby trust set up to protect the public health and safety and the environment, without diligence, presentment, demand, protest or any other notice of any kind, all of which are expressly waived by guarantor; and

(2) Exercise any and all of its other rights under applicable law.

G. The guarantor must notify the NRC, in writing, immediately following the occurrence of any event listed in paragraph F of this appendix, and must include a description of the event, including major creditors, the amounts involved, and the actions taken to assure that the amount of funds guaranteed by the self-guarantee agreement for decommissioning will be transferred to the standby trust as soon as possible.

12. In appendix E to Part 30, in Section II, paragraphs A.(1), B.(1), C.(1), and C.(2) are revised, in Section III, paragraphs D and E are revised and paragraphs F, G, and H are added to read as follows:

Appendix E to Part 30—Criteria Relating to Use of Financial Tests and Self-Guarantee for Providing Reasonable Assurance of Funds for Decommissioning by Nonprofit Colleges, Universities, and Hospitals

*****

II. ***

A. ***

(1) For applicants or licensees that issue bonds, a current rating for its most recent uninsured, uncollateralized, and unencumbered bond issuance of AAA, AA, or A (including adjustments of + or -) as issued by Standard and Poor's (S&P) or Aaa, Aa, or A (including adjustments of 1, 2, or 3) as issued by Moody's.

*****

B.***

(1) For applicants or licensees that issue bonds, a current rating for its most recent uninsured, uncollateralized, and unencumbered bond issuance of AAA, AA, or A (including adjustments of + or -) as issued by Standard and Poor's or Aaa, Aa, or A (including adjustments of 1, 2, or 3) as issued by Moody's.

*****

C.***

(1) The licensee's independent certified public accountant must compare the data used by the licensee 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. The

accountant must evaluate the licensee's off-balance sheet transactions and provide an opinion on whether those transactions could materially adversely affect the licensee's ability to pay for decommissioning costs. The accountant must verify that a bond rating, if used to demonstrate passage of the financial test, meets the requirements of Section II of this appendix. In connection with the auditing procedure, the licensee must 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 licensee no longer passes the test.

(2) After the initial financial test, the licensee must repeat passage of the test and provide documentation of its continued eligibility to use the self-guarantee to the Commission within 90 days after the close of each succeeding fiscal year.

*****

III. ***

D. The applicant or licensee must provide to the Commission a written guarantee (a written commitment by a corporate officer or officer of the institution) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the Commission, the licensee will fund the standby trust in the amount of the current cost estimates for decommissioning.

E. (1) If, at any time, the licensee's most recent bond issuance ceases to be rated in any category of ''A'' or above by either Standard and Poor's or Moody's, the licensee shall notify the Commission in writing within 20 days after publication of the change by the rating service.

(2) If the licensee's most recent bond issuance ceases to be rated in any category of "A-" and above by Standard and Poor's or in any category of "A3" and above by Moody's, the licensee no longer meets the requirements of Section II.A. of this appendix.

F. (1) A standby trust to protect public health and safety and the environment must be established for decommissioning costs before the self-guarantee agreement is submitted.

(2) 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. The Commission has the right to change the trustee. An acceptable trust will meet the regulatory criteria established in the part of these regulations that governs the issuance of the license for which the guarantor has accepted the obligation to pay for decommissioning costs.

G. The guarantor must agree that if the guarantor admits in writing its inability to pay its debts generally, or makes a general assignment for the benefit of creditors, or any proceeding is instituted by or against the guarantor seeking to adjudicate it as bankrupt or insolvent, or seeking dissolution, liquidation, winding-up, reorganization, arrangement, adjustment, protection, relief or composition of it or its debts under any law relating to bankruptcy, insolvency, or reorganization or relief of debtors, or seeking the entry of an order for relief or the appointment of a receiver, trustee, custodian, or other similar official for guarantor or for any substantial part of its property, or the guarantor takes any action to authorize or effect any of the actions stated in this paragraph, then the Commission may:

(1) Declare that the financial assurance guaranteed by the self-guarantee agreement is immediately due and payable to the standby trust set up to protect the public health and safety and the environment, without diligence, presentment, demand, protest or any other notice of any kind, all of which are expressly waived by guarantor; and

(2) Exercise any and all of its other rights under applicable law.

H. The guarantor must notify the NRC, in writing, immediately following the occurrence of any event listed in paragraph G of this appendix, and must include a description of the event, including major creditors, the amounts involved, and the actions taken to assure that the amount

of funds guaranteed by the self-guarantee agreement for decommissioning will be transferred to the standby trust as soon as possible.

PART 40 — DOMESTIC LICENSING OF SOURCE MATERIAL.

13. The authority citation for Part 40 continues to read as follows:

Authority: Secs. 62, 63, 64, 65, 81, 161, 182, 183, 186, 68 Stat. 932, 933, 935, 948, 953, 954, 955, as amended, secs. 11e(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, 2236, 2282); sec. 274, Pub. L. 86-373, 73 Stat. 688 (42 U.S.C. 2021); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (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); sec. 193, 104 Stat. 2835, as amended by Pub. L. 104-134, 110 Stat. 1321, 1321-349 (42 U.S.C. 2243); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note).

Section 40.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 102-486, sec. 2902, 106 Stat. 3123 (42 U.S.C. 5851). Section 40.31(g) also issued under sec. 122, 68 Stat. 939 (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).

14. In § 40.36, a new paragraph (c)(5) is added, paragraph (d), the introductory text in paragraph (e), and paragraphs (e)(1), the introductory text of paragraph (e)(2) and paragraph (e)(3) are revised, and a new paragraph (g) is added to read as follows:

§ 40.36 Financial assurance and recordkeeping for decommissioning.

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(c) ***

(5) If, in surveys made under 10 CFR 20.1501(a), residual radioactivity in the facility and environment, including the subsurface, is detected at levels that would, if left uncorrected, prevent the site from meeting the 10 CFR 20.1402 criteria for unrestricted use, the licensee must submit a decommissioning funding plan within one year of when the survey is completed.

(d)(1) Each decommissioning funding plan must be submitted for review and approval and must contain –

(i) A detailed cost estimate for decommissioning, in an amount reflecting:

(A) The cost of an independent contractor to perform all decommissioning activities;

(B) The cost of meeting the 10 CFR 20.1402 criteria for unrestricted use, provided that, if the applicant or licensee can demonstrate its ability to meet the provisions of 10 CFR 20.1403, the cost estimate may be based on meeting the 10 CFR 20.1403 criteria;

(C) The volume of onsite subsurface material containing residual radioactivity that will require remediation; and

(D) An adequate contingency factor.

(ii) Identification of and justification for using the key assumptions contained in the DCE;

(iii) A description of the method of assuring funds for decommissioning from paragraph (e) of this section, including means for adjusting cost estimates and associated funding levels periodically over the life of the facility;

(iv) A certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning; and

(v) A signed original, or if permitted, a copy, of the financial instrument obtained to satisfy the requirements of paragraph (e) of this section (unless a previously submitted and accepted financial instrument continues to cover the cost estimate for decommissioning).

(2) At the time of license renewal and at intervals not to exceed 3 years, the decommissioning funding plan must be resubmitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted downward, this can not be done until the updated decommissioning funding plan is approved. The decommissioning funding plan must update the information submitted with the original or prior approved plan, and must specifically consider the effect of the following events on decommissioning costs:

(i) Spills of radioactive material producing additional residual radioactivity in onsite subsurface material;

(ii) Waste inventory increasing above the amount previously estimated;

(iii) Waste disposal costs increasing above the amount previously estimated;

(iv) Facility modifications;

(v) Changes in authorized possession limits;

(vi) Actual remediation costs that exceed the previous cost estimate;

(vii) Onsite disposal; and

(viii) Use of a settling pond.

(e) The financial instrument must include the licensee's name, license number, and docket number; and the name, address, and other contact information of the issuer, and, if a trust is used, the trustee. When any of the foregoing information changes, the licensee must, within 30 days, submit financial instruments reflecting such changes. The financial instrument submitted must be a signed original or signed original duplicate, except where a copy is specifically permitted. Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) *Prepayment.* Prepayment is the deposit before 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 must be made into a trust account, and the trustee and the trust must be acceptable to the Commission.

(2) *A surety method, insurance, or other guarantee method.* These methods guarantee that decommissioning costs will be paid. A surety method may be in the form of a surety bond, or letter 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. For commercial corporations that issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in appendix C to this part. For commercial companies that do not issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs may be used if the guarantee and test are as contained in appendix D to this part. For nonprofit entities, such as colleges, universities, and nonprofit hospitals, a guarantee of funds by the applicant or licensee may be used if the guarantee and test are as contained in appendix E to this part. Except for an external sinking fund, a parent company guarantee or guarantee by the applicant or licensee may not be used in combination with any other financial methods used to satisfy the requirements of this section. A guarantee by the applicant or licensee may not be used in any situation where the applicant or licensee has a parent company holding majority control of the voting stock of the company. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

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(3) *An external sinking fund in which deposits are made at least annually, coupled with a surety method, insurance, or other guarantee method, 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 must be in the form of a trust. If the other guarantee method is used, no surety or insurance may be combined with the external sinking fund. The surety, insurance, or other guarantee provisions must be as stated in paragraph (e)(2) of this section.

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(g) In providing financial assurance under this section, each licensee must use the financial assurance funds only for decommissioning activities and each licensee must monitor the balance of funds held to account for market variations. The licensee must replenish the funds, and report such actions to the NRC, as follows:

(1) If, at the end of a calendar quarter, the fund balance is below the amount necessary to cover the cost of decommissioning, but is not below 75 percent of the cost, the licensee must increase the balance to cover the cost, and must do so within 30 days after the end of the calendar quarter.

(2) If, at any time, the fund balance falls below 75 percent of the amount necessary to cover the cost of decommissioning, the licensee must increase the balance to cover the cost, and must do so within 30 days of the occurrence.

(3) Within 30 days of taking the actions required by paragraph (g)(1) or (g)(2) of this section, the licensee must provide a written report of such actions to the Director, Office of Federal and State Materials and Environmental Management Programs, and state the new balance of the fund.

15. In § 40.46, the current paragraph is designated as paragraph (a) and a new paragraph (b) is added to read as follows:

§ 40.46 Inalienability of licenses.

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(b) An application for transfer of license must include:

(1) The identity, technical and financial qualifications of the proposed transferee; and

(2) Financial assurance for decommissioning information required by § 40.36 or appendix A to this part, as applicable.

16. In appendix A to Part 40, Section II, Criterion 9 is revised to read as follows:

Appendix A to Part 40—Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content

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II. ***

Criterion 9-- (a) Financial surety arrangements must be established by each mill operator before the commencement of operations to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site and for the reclamation of any tailings or waste disposal areas. The amount of funds to be ensured by such surety arrangements must be based on Commission-approved cost estimates in a Commission-approved plan, or a proposed revision to the plan submitted to the Commission for approval, if the proposed revision contains a higher cost estimate, for

(1) Decontamination and decommissioning of mill buildings and the milling site to levels which allow unrestricted use of these areas upon decommissioning, and

(2) The reclamation of tailings and/or waste areas in accordance with technical criteria delineated in Section I of this appendix.

(b) Each cost estimate must contain –

(1) A detailed cost estimate for decontamination, decommissioning, and reclamation, in an amount reflecting:

(i) The cost of an independent contractor to perform the decontamination, decommissioning and reclamation activities; and

(ii) An adequate contingency factor;

(2) An estimate of the amount of radioactive contamination in onsite subsurface material;

(3) Identification of and justification for using the key assumptions contained in the DCE; and

(4) A description of the method of assuring funds for decontamination, decommissioning, and reclamation.

(c) The licensee shall submit this plan in conjunction with an environmental report that addresses the expected environmental impacts of the milling operation, decommissioning and tailings reclamation, and evaluates alternatives for mitigating these impacts. The plan must include a signed original of the financial instrument obtained to satisfy the surety arrangement requirements of this criterion (unless a previously submitted and approved financial instrument continues to cover the cost estimate for decommissioning). The surety arrangement must also cover the cost estimate and the payment of the charge for long-term surveillance and control required by Criterion 10 of this section.

(d) To avoid unnecessary duplication and expense, the Commission may accept financial sureties that have been consolidated with financial or surety arrangements established to meet requirements of other Federal or state agencies and/or local governing bodies for decommissioning, decontamination, reclamation, and long-term site surveillance and control, provided such arrangements are considered adequate to satisfy these requirements and that the portion of the surety which covers the decommissioning and reclamation of the mill, mill

tailings site and associated areas, and the long-term funding charge is clearly identified and committed for use in accomplishing these activities.

(e) The licensee's surety mechanism will be reviewed annually by the Commission to assure, that sufficient funds would be available for completion of the reclamation plan if the work had to be performed by an independent contractor.

(f) The amount of surety liability should be adjusted to recognize any increases or decreases resulting from:

(1) Inflation;

(2) Changes in engineering plans;

(3) Activities performed;

(4) Spills, leakage or migration of radioactive material producing additional contamination in onsite subsurface material that must be remediated to meet applicable remediation criteria;

(5) Waste inventory increasing above the amount previously estimated;

(6) Waste disposal costs increasing above the amount previously estimated;

(7) Facility modifications;

(8) Changes in authorized possession limits;

(9) Actual remediation costs that exceed the previous cost estimate;

(10) Onsite disposal; and

(11) Any other conditions affecting costs.

(g) Regardless of whether reclamation is phased through the life of the operation or takes place at the end of operations, an appropriate portion of surety liability must be retained until final compliance with the reclamation plan is determined.

(h) The appropriate portion of surety liability retained until final compliance with the reclamation plan is determined will be at least sufficient at all times to cover the costs of decommissioning and reclamation of the areas that are expected to be disturbed before the next

license renewal. The term of the surety mechanism must be open ended, unless it can be demonstrated that another arrangement would provide an equivalent level of assurance. This assurance would be provided with a surety instrument which is written for a specified time (e.g., 5 years) and which must be automatically renewed unless the surety notifies the beneficiary (the Commission or the State regulatory agency) and the principal (the licensee) with reasonable time (e.g., 90 days) before the renewal date of their intention not to renew. In such a situation the surety requirement still exists and the licensee would be required to submit an acceptable replacement surety within a brief time to allow at least 60 days for the regulatory agency to collect.

(i) Proof of forfeiture must not be necessary to collect the surety. In the event that the licensee can not provide an acceptable replacement surety within the required time, the surety shall be automatically collected before its expiration. The surety instrument must provide for collection of the full face amount immediately on demand without reduction for any reason, except for trustee fees and expenses provided for in a trust agreement, and that the surety will not refuse to make full payment. The conditions described previously would have to be clearly stated on any surety instrument which is not open-ended, and must be agreed to by all parties. Financial surety arrangements generally acceptable to the Commission are:

(1) Trust funds;

(2) Surety bonds;

(3) Irrevocable letters of credit; and

(4) Combinations of the financial surety arrangements or other types of arrangements as may be approved by the Commission. If a trust is not used, then a standby trust must be set up to receive funds in the event the Commission or State regulatory agency exercises its right to collect the surety. The surety arrangement and the surety or trustee, as applicable, must be acceptable to the Commission. Self insurance, or any arrangement which essentially

constitutes self insurance (e.g., a contract with a State or Federal agency), will not satisfy the surety requirement because this provides no additional assurance other than that which already exists through license requirements.

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PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES.

17. The authority citation for Part 50 continues to read as follows:

Authority: Secs. 102, 103, 104, 161, 182, 183, 186, 189, 68 Stat. 936, 937, 938, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2201, 2232, 2233, 2236, 2239, 2282); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note); sec. 651(e), Pub. L. 109-58, 119 Stat. 806-810 (42 U.S.C. 2014, 2021, 2021b, 2111). Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5841). Section 50.10 also issued under secs. 101, 185, 68 Stat. 955, as amended (42 U.S.C. 2131, 2235); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.13, 50.54(dd), and 50.103 also issued under sec. 108, 68 Stat. 939, as amended (42 U.S.C. 2138).

Sections 50.23, 50.35, 50.55, and 50.56 also issued under sec. 185, 68 Stat. 955 (42 U.S.C. 2235). Sections 50.33a, 50.55a and Appendix Q also issued under sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.34 and 50.54 also issued under sec. 204, 88 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. 2239). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.80 - 50.81 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Appendix F also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

18. In § 50.75, the introductory text of paragraph (e)(1)(iii)(A), and paragraphs (f)(1) and (f)(2) are revised to read as follows:

§ 50.75 Reporting and recordkeeping for decommissioning planning.

*****

(e) ***

(1) ***

(iii) ***

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

*****

(f)(1) Each power reactor licensee shall report, on a calendar-year basis, to the NRC by March 31, 1999, and at least once every 2 years thereafter on the status of its decommissioning funding for each reactor or part of a reactor that it owns. However, each holder of a combined license under part 52 of this chapter need not begin reporting until the date that the Commission has made the finding under § 52.103(g) of this chapter. The information in this report must include, at a minimum, the amount of decommissioning funds estimated to be required pursuant to 10 CFR 50.75(b) and (c); the amount of decommissioning funds accumulated to the end of the calendar year preceding the date of the report; a schedule of the annual amounts remaining to be collected; the assumptions used regarding rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections; any contracts upon which the licensee is relying pursuant to paragraph (e)(1)(v) of this section; any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report; and any material changes to trust agreements. If any

of the preceding items is not applicable, the licensee should so state in its report. Any licensee for a plant that is within 5 years of the projected end of its operation, or where conditions have changed such that it will close within 5 years (before the end of its licensed life), or that has already closed (before the end of its licensed life), or that is involved in a merger or an acquisition shall submit this report annually.

(2) Each power reactor licensee shall report, on a calendar-year basis, to the NRC by March 31, 1999, and at least once every 2 years thereafter on the status of its decommissioning funding for each reactor or part of a reactor that it owns. The information in this report must include, at a minimum, the amount of decommissioning funds estimated to be required pursuant to 10 CFR 50.75(b) and (c); the amount of decommissioning funds accumulated to the end of the calendar year preceding the date of the report; a schedule of the annual amounts remaining to be collected; the assumptions used regarding rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections; any contracts upon which the licensee is relying pursuant to paragraph (e)(1)(v) of this section; any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report; and any material changes to trust agreements. If any of the preceding items is not applicable, the licensee should so state in its report. Any licensee for a plant that is within 5 years of the projected end of its operation, or where conditions have changed such that it will close within 5 years (before the end of its licensed life), or that has already closed (before the end of its licensed life), or that is involved in a merger or an acquisition shall submit this report annually.

*****

19. In § 50.82, paragraph (a)(4)(i) is revised, and paragraphs (a)(8)(v), (a)(8)(vi), and (a)(8)(vii) are added to read as follows:

§ 50.82 Termination of license.

*****

(a) ***

(4)(i) Within 2 years following permanent cessation of operations, the licensee shall submit a post-shutdown decommissioning activities report (PSDAR) to the NRC, and a copy to the affected State(s). The PSDAR must contain a description of the planned decommissioning activities along with a schedule for their accomplishment, a discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements, and a site-specific DCE, including the projected cost of managing irradiated fuel.

*****

(8) ***

(v) After submitting its site-specific DCE required by paragraph (a)(4)(i) of this section, and until the licensee has completed its final radiation survey and demonstrated that residual radioactivity has been reduced to a level that permits termination of its license, the licensee must annually submit to the NRC, by March 31, a financial assurance status report. The report must include the following information, current through the end of the previous calendar year:

(A) The amount spent on decommissioning, both cumulative and over the previous calendar year, the remaining balance of any decommissioning funds, and the amount provided by other financial assurance methods being relied upon;

(B) An estimate of the costs to complete decommissioning, reflecting any difference between actual and estimated costs for work performed during the year, and the decommissioning criteria upon which the estimate is based;

(C) Any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report; and

(D) Any material changes to trust agreements or financial assurance contracts.

(vi) If the sum of the balance of any remaining decommissioning funds, plus earnings on such funds calculated at not greater than a 2 percent real rate of return, together with the amount provided by other financial assurance methods being relied upon, does not cover the estimated cost to complete the decommissioning, the financial assurance status report must include additional financial assurance to cover the estimated cost of completion.

(vii) After submitting its site-specific DCE required by paragraph (a)(4)(i) of this section, the licensee must annually submit to the NRC, by March 31, a report on the status of its funding for managing irradiated fuel. The report must include the following information, current through the end of the previous calendar year:

(A) The amount of funds accumulated to cover the cost of managing the irradiated fuel;

(B) The projected cost of managing irradiated fuel until title to the fuel and possession of the fuel is transferred to the Secretary of Energy; and

(C) If the funds accumulated do not cover the projected cost, a plan to obtain additional funds to cover the cost.

*****

PART 70--DOMESTIC LICENSING OF SPECIAL NUCLEAR MATERIAL

20. The authority citation for Part 70 continues to read as follows:

Authority: Secs. 51, 53, 161, 182, 183, 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, 2297f); secs. 201, as amended, 202, 204, 206, 88 Stat. 1242, as amended, 1244, 1245, 1246 (42 U.S.C. 5841, 5842, 5845, 5846). Sec. 193, 104 Stat. 2835, as amended by Pub. L. 104-134, 110 Stat. 1321, 1321-349 (42 U.S.C. 2243); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note).

Sections 70.1(c) and 70.20a(b) also issued under secs. 135, 141, Pub. L. 97-425, 96 Stat. 2232, 2241 (42 U.S.C. 10155, 10161). Section 70.7 is also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 102-486, sec. 2902, 106 Stat. 3123 (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 70.81 also issued under secs. 186, 187, 68 Stat. 955 (42 U.S.C. 2236, 2237). Section 70.82 also issued under sec. 108, 68 Stat. 939, as amended (42 U.S.C. 2138).

21. In § 70.25, a new paragraph (c)(5) is added, paragraph (e), the introductory text in paragraph (f), and paragraph (f)(1), the introductory text of paragraph (f)(2) and paragraph (f)(3) are revised, and a new paragraph (h) is added to read as follows:

§ 70.25 Financial assurance and recordkeeping for decommissioning.

*****

(c) ***

(5) If, in surveys made under 10 CFR 20.1501(a), residual radioactivity in the facility and environment, including the subsurface, is detected at levels that would, if left uncorrected, prevent the site from meeting the 10 CFR 20.1402 criteria for unrestricted use, the licensee must submit a decommissioning funding plan within one year of when the survey is completed.

*****

(e)(1) Each decommissioning funding plan must be submitted for review and approval and must contain –

(i) A detailed cost estimate for decommissioning, in an amount reflecting:

(A) The cost of an independent contractor to perform all decommissioning activities;

(B) The cost of meeting the 10 CFR 20.1402 criteria for unrestricted use, provided that, if the applicant or licensee can demonstrate its ability to meet the provisions of 10 CFR 20.1403, the cost estimate may be based on meeting the 10 CFR 20.1403 criteria;

(C) The volume of onsite subsurface material containing residual radioactivity that will require remediation; and

(D) An adequate contingency factor.

(ii) Identification of and justification for using the key assumptions contained in the DCE;

(iii) A description of the method of assuring funds for decommissioning from paragraph (f) of this section, including means for adjusting cost estimates and associated funding levels periodically over the life of the facility;

(iv) A certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning; and

(v) A signed original, or, if permitted, a copy, of the financial instrument obtained to satisfy the requirements of paragraph (f) of this section (unless a previously submitted and accepted financial instrument continues to cover the cost estimate for decommissioning).

(2) At the time of license renewal and at intervals not to exceed 3 years, the decommissioning funding plan must be resubmitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted downward, this can not be done until the updated decommissioning funding plan is approved. The decommissioning funding plan must update the information submitted with the original or prior approved plan, and must specifically consider the effect of the following events on decommissioning costs:

(i) Spills of radioactive material producing additional residual radioactivity in onsite subsurface material;

(ii) Waste inventory increasing above the amount previously estimated;

(iii) Waste disposal costs increasing above the amount previously estimated;

(iv) Facility modifications;

(v) Changes in authorized possession limits;

(vi) Actual remediation costs that exceed the previous cost estimate;

(vii) Onsite disposal; and

(viii) Use of a settling pond.

(f) The financial instrument must include the licensee's name, license number, and docket number; and the name, address, and other contact information of the issuer, and, if a trust is used, the trustee. When any of the foregoing information changes, the licensee must, within 30 days, submit financial instruments reflecting such changes. Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) *Prepayment.* Prepayment is the deposit before 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 must be made into a trust account, and the trustee and the trust must be acceptable to the Commission.

(2) *A surety method, insurance, or other guarantee method.* These methods guarantee that decommissioning costs will be paid. A surety method may be in the form of a surety bond, or letter 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. For commercial corporations that issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in appendix C to this part. For commercial companies that do not issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs may be used if the guarantee and test are as contained in appendix D to this part. For nonprofit entities, such as

colleges, universities, and nonprofit hospitals, a guarantee of funds by the applicant or licensee may be used if the guarantee and test are as contained in appendix E to this part. Except for an external sinking fund, a parent company guarantee or a guarantee by the applicant or licensee may not be used in combination with any other financial methods used to satisfy the requirements of this section. A guarantee by the applicant or licensee may not be used in any situation where the applicant or licensee has a parent company holding majority control of the voting stock of the company. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

*****

(3) *An external sinking fund in which deposits are made at least annually, coupled with a surety method, insurance, or other guarantee method, 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 must be in the form of a trust. If the other guarantee method is used, no surety or insurance may be combined with the external sinking fund. The surety, insurance, or other guarantee provisions must be as stated in paragraph (f)(2) of this section.

*****

(h) In providing financial assurance under this section, each licensee must use the financial assurance funds only for decommissioning activities and each licensee must monitor the balance of funds held to account for market variations. The licensee must replenish the funds, and report such actions to the NRC, as follows:

(1) If, at the end of a calendar quarter, the fund balance is below the amount necessary to cover the cost of decommissioning, but is not below 75 percent of the cost, the licensee must

increase the balance to cover the cost, and must do so within 30 days after the end of the calendar quarter.

(2) If, at any time, the fund balance falls below 75 percent of the amount necessary to cover the cost of decommissioning, the licensee must increase the balance to cover the cost, and must do so within 30 days of the occurrence.

(3) Within 30 days of taking the actions required by paragraph (g)(1) or (g)(2) of this section, the licensee must provide a written report of such actions to the Director, Office of Federal and State Materials and Environmental Management Programs, and state the new balance of the fund.

22. In § 70.36, the current paragraph is designated as paragraph (a) and a new paragraph (b) is added to read as follows:

§ 70.36 Inalienability of licenses.

*****

(b) An application for transfer of license must include:

(1) The identity, technical and financial qualifications of the proposed transferee; and

(2) Financial assurance for decommissioning information required by § 70.25.

PART 72--LICENSING REQUIREMENTS FOR THE INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL, HIGH-LEVEL RADIOACTIVE WASTE, AND REACTOR-RELATED GREATER THAN CLASS C WASTE

23. The authority citation for Part 72 continues 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, 948, 953, 954, 955, as amended; sec. 234, 83 Stat. 444, as

amended (42 U.S.C. 2071, 2073, 2077, 2092, 2093, 2095, 2099, 2111, 2201, 2232, 2233, 2234, 2236, 2237, 2238, 2282); sec. 274, Pub. L. 86-373, 73 Stat. 688, as amended (42 U.S.C. 2021); sec. 201, as amended; 202, 206, 88 Stat. 1242, as amended; 1244, 1246 (42 U.S.C. 5841, 5842, 5846); Pub. L. 95-601, sec. 10, 92 Stat. 2951, as amended by Pub. L. 102-486, sec. 7902, 106 Stat. 3123 (42 U.S.C. 5851); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332); secs. 131, 132, 133, 135, 137, 141, Pub. L. 97-425, 96 Stat. 2229, 2230, 2232, 2241; sec. 148, Pub. L. 100-203, 101 Stat. 1330-235 (42 U.S.C. 10151, 10152, 10153, 10155, 10157, 10161, 10168); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note); sec. 651(e), Pub. L. 109–58, 119 Stat. 806–10 (42 U.S.C. 2014, 2021, 2021b, 2111).

Section 72.44(g) also issued under secs. 142(b) and 148(c), (d), Pub. L. 100-203, 101 Stat. 1330-232, 1330-236 (42 U.S.C. 10162(b), 10168(c), (d)). Section 72.46 also issued under sec. 189, 68 Stat. 955 (42 U.S.C. 2239); sec. 134, Pub. L. 97-425, 96 Stat. 2230 (42 U.S.C. 10154). Section 72.96(d) also issued under sec. 145(g), Pub. L. 100-203, 101 Stat. 1330-235 (42 U.S.C. 10165(g)). Subpart J also issued under secs. 2(2), 2(15), 2(19), 117(a), 141(h), Pub. L. 97-425, 96 Stat. 2202, 2203, 2204, 2222, 2224 (42 U.S.C. 10101, 10137(a), 10161(h)). Subparts K and L are also issued under sec. 133, 98 Stat. 2230 (42 U.S.C. 10153) and sec. 218(a), 96 Stat. 2252 (42 U.S.C. 10198).

24. In § 72.13, paragraph (c) is revised to read as follows:

§ 72.13 Applicability.

*****

(c) The following sections apply to activities associated with a general license: 72.1; 72.2(a)(1), (b), (c), and (e); 72.3 through 72.6(c)(1); 72.7 through 72.13(a) and (c); 72.30(b), (c), (d), (e) and (f); 72.32(c) and (d); 72.44(b) and (f); 72.48; 72.50(a); 72.52(a), (b), (d), and (e);

72.60; 72.62; 72.72 through 72.80(f); 72.82 through 72.86; 72.104; 72.106; 72.122; 72.124; 72.126; 72.140 through 72.176; 72.190; 72.194; 72.210 through 72.220, and 72.240(a).

*****

25. In § 72.30, paragraph (b) is revised, paragraph (c) is redesignated as paragraph (e) and the introductory text of the newly redesignated paragraph (e), paragraphs (e)(1), the introductory text of paragraph (e)(2) and paragraph (e)(3) are revised, paragraph (e)(5) is revised, paragraph (d) is redesignated as paragraph (f) and the newly redesignated paragraphs (f)(3)(ii) and (f)(4) are revised, and new paragraphs (c), (d), and (g) are added to read as follows:

§ 72.30 Financial assurance and recordkeeping for decommissioning.

*****

(b) Each holder of, or applicant for, a license under this part must submit for NRC review and approval a decommissioning funding plan that must contain:

(1) Information on how reasonable assurance will be provided that funds will be available to decommission the ISFSI or MRS.

(2) A detailed cost estimate for decommissioning, in an amount reflecting:

(i) The cost of an independent contractor to perform all decommissioning activities;

(ii) An adequate contingency factor; and

(iii) The cost of meeting the § 20.1402 criteria for unrestricted use, provided that, if the applicant or licensee can demonstrate its ability to meet the provisions of § 20.1403 of this chapter, the cost estimate may be based on meeting the § 20.1403 criteria.

(3) Identification of and justification for using the key assumptions contained in the DCE.

(4) A description of the method of assuring funds for decommissioning from paragraph (e) of this section, including means for adjusting cost estimates and associated funding levels periodically over the life of the facility.

(5) The volume of onsite subsurface material containing residual radioactively that will require remediation to meet the criteria for license termination.

(6) A certification that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning.

(c) At the time of license renewal and at intervals not to exceed 3 years the decommissioning funding plan must be resubmitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted downward, this can not be done until the updated decommissioning funding plan is approved. The decommissioning funding plan must update the information submitted with the original or prior approved plan and must specifically consider the effect of the following events on decommissioning costs:

(1) Spills of radioactive material producing additional residual radioactivity in onsite subsurface material.

(2) Facility modifications.

(3) Changes in authorized possession limits.

(4) Actual remediation costs that exceed the previous cost estimate.

(d) If, in surveys made under 10 CFR 20.1501(a), residual radioactivity in soils or ground water is detected at levels that would require such radioactivity to be reduced to a level permitting release of the property for unrestricted use under the decommissioning requirements in part 20 of this chapter, the licensee must submit a new or revised decommissioning funding plan within one year of when the survey is completed.

(e) The financial instrument must include the licensee's name, license number, and docket number; and the name, address, and other contact information of the issuer, and, if a trust is used, the trustee. When any of the foregoing information changes, the licensee must, within 30 days, submit financial instruments reflecting such changes. Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) *Prepayment*. Prepayment is the deposit before 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 must be made into a trust account, and the trustee and the trust must be acceptable to the Commission.

(2) *A surety method, insurance, or other guarantee method*. These methods guarantee that decommissioning costs will be paid. A surety method may be in the form of a surety bond, or letter 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 part 30 of this chapter. For commercial corporations that issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in appendix C to part 30 of this chapter. For commercial companies that do not issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs may be used if the guarantee and test are as contained in appendix D to part 30 of this chapter. Except for an external sinking fund, a parent company guarantee or a guarantee by the applicant or licensee may not be used in combination with other financial methods to satisfy the requirements of this section. A guarantee by the applicant or licensee may not be used in any situation where the applicant or licensee has a parent company holding majority control of the voting stock of the company. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

*****

(3) *An external sinking fund in which deposits are made at least annually, coupled with a surety method, insurance, or other guarantee method, 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 must be in the form of a trust. If the other guarantee method is used, no surety or insurance may be combined with the external sinking fund. The surety, insurance, or other guarantee provisions must be as stated in paragraph (e)(2) of this section.

*****

(5) In the case of licensees who are issued a power reactor license under part 50 of this chapter or ISFSI licensees who are an electric utility, as defined in part 50 of this chapter, with a specific license issued under this part, the methods of 10 CFR 50.75(b), (e), and (h), as applicable. In the event that funds remaining to be placed into the licensee's ISFSI decommissioning external sinking fund are no longer approved for recovery in rates by a competent rate making authority, the licensee must make changes to provide financial assurance using one or more of the methods stated in paragraphs (1)-(4) of this section.

(f) ***

(3) ***

(ii) All areas outside of restricted areas that require documentation under § 72.30(f)(1).

(4) Records of the cost estimate performed for the decommissioning funding plan and records of the funding method used for assuring funds are available for decommissioning.

(g) In providing financial assurance under this section, each licensee must use the financial assurance funds only for decommissioning activities and each licensee must monitor the

balance of funds held to account for market variations. The licensee must replenish the funds, and report such actions to the NRC, as follows:

(1) If, at the end of a calendar year, the fund balance is below the amount necessary to cover the cost of decommissioning, but is not below 75 percent of the cost, the licensee must increase the balance to cover the cost, and must do so within 30 days after the end of the calendar year.

(2) If, at any time, the fund balance falls below 75 percent of the amount necessary to cover the cost of decommissioning, the licensee must increase the balance to cover the cost, and must do so within 30 days of the occurrence.

(3) Within 30 days of taking the actions required by paragraph (g)(1) or (g)(2) of this section, the licensee must provide a written report of such actions to the Director, Office of Federal and State Materials and Environmental Management Programs, and state the new balance of the fund.

26. In § 72.50, paragraph (b)(3) is added to read as follows:

§ 72.50 Transfer of license.

*****

(b) ***

(3) The application shall describe the financial assurance that will be provided for the decommissioning of the facility under § 72.30.

*****

27. In § 72.80, paragraphs (e) and (f) are revised to read as follows:

§ 72.80 Other records and reports.

*****

(e) Prior to license termination, the licensee shall forward records required by § 20.2103(b)(4), of this chapter, and § 72.30(f) to the appropriate NRC Regional Office.

(f) If licensed activities are transferred or assigned in accordance with § 72.44(b)(1), the licensee shall transfer the records required by § 20.2103(b)(4), of this chapter, and § 72.30(f) to the new licensee and the new licensee will be responsible for maintaining these records until the license is terminated.

* * * * *

Dated at Rockville, Maryland, this _th day of _____ 2008.

For the Nuclear Regulatory Commission.

_____
Annette Vietti-Cook,
Secretary for the Commission.

Regulatory Analysis for Final Rule - Decommissioning Planning

U.S. Nuclear Regulatory Commission
September 2008

EXECUTIVE SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) plans to publish a final rule (RIN: 3150-AH45) amending its regulations to improve decommissioning planning and reduce the likelihood that any currently operating facility will become a "legacy site." A "legacy site" is a facility that is decommissioning and has an owner who cannot complete the decommissioning work for technical or financial reasons.

Past experience indicates two contributing factors to licensees' inability to fund decommissioning: 1) licensees' underestimation of residual radioactivity during operations; and 2) insufficient funds assigned by the licensee to the financial instrument used as an assurance to complete decommissioning. For licensees that operate source, byproduct and special nuclear material facilities, site decommissioning usually occurs soon after the facility shuts down. For power reactor licensees, site decommissioning is more complex and starts several years after the reactor has been shut down. For all licensees, lowering the risk of becoming a legacy site is an important regulatory topic that is best addressed during facility operations when there is time to plan and assure adequate funds for decommissioning.

NRC staff estimate that a small number of rare metal extraction facilities are at risk to have significant residual radioactivity in their subsurface environment and would need to perform additional site surveys, by the effective date of the final rule, to identify the residual radioactivity, as required in amended 10 CFR 20.1406 and 20.1501. Staff has no basis to conclude that by the effective date of the final rule, power reactors, fuel cycle facilities, and the large majority of source and byproduct facilities, will need to perform additional surveys. About 45 licensees will be affected by tighter controls and additional reporting requirements in changes to the parent guarantee and self guarantee decommissioning financial assurance regulations. A few licensees will be affected by additional reporting requirements under changes to 10 CFR 50.82. About 20 licensees will be affected by the elimination of the escrow account and will have a one-time cost to switch to a trust agreement as financial assurance. About 500 NRC licensees and about 1,000 Agreement State licensees will have a one-time labor effort of about 90 minutes per licensee to read the final rule changes to 10 CFR Part 20 and to read the related guidance document for survey and monitoring requirements under amended 10 CFR 20.1406 and 20.1501. New reporting requirements in 10 CFR 72.30(b), (c) and (d) will apply to ISFSI general and specific licensees.

This Regulatory Analysis provides an evaluation of three alternatives. The preferred alternative is Alternative 2 which amends regulations as specified in the final rule. This alternative is less costly than the other two and provides a risk-informed regulatory framework to reduce the likelihood of a future legacy site compared to current regulations.

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CD	Certificate of Deposit
DCE	Decommissioning Cost Estimate
LOC	Line of Credit
DFP	Decommissioning Funding Plan
DFSR	Decommissioning Fund Status Report
FA	Financial Assurance
gm	gram
ISFSI	Independent Spent Fuel Storage Installation
LTR	License Termination Rule
mCi	milli-curie
NRC	Nuclear Regulatory Commission
OMB	Office of Management and Budget
pCi	pico-curie
SFMF	Spent Fuel Management Fund
S&P	Standard and Poor's
TF	Trust Fund
TL	Total Liabilities
TNW	Tangible Net Worth
UCC	Uniform Commercial Code
µCi	micro-Curie

1. INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) intends to publish a final rule amending its regulations to improve decommissioning planning and thereby reduce the likelihood that any of NRC's licensed facilities will become a "legacy site." A "legacy site" is a facility that is decommissioning with an owner who cannot complete the decommissioning work for technical or financial reasons. The NRC terminates several hundred licenses each year and most of the licensed sites require little, if any, remediation to meet NRC's license termination criteria. A few licenses can only be terminated after several years of complex decommissioning efforts. The license termination process for these complex sites continues to be slow and expensive for both the owners and regulatory agencies.

In 2006, NRC regulated 32 complex decommissioning sites. Of those sites, 8 were legacy sites. There were 6 legacy sites in December 2007. If a legacy site is incapable of funding site remediation, the last option available to NRC is to pursue Congressional funding for site cleanup with another agency (State or Federal) directing the remediation efforts.

Legacy sites have two common characteristics: subsurface residual radioactivity in amounts greater than anticipated, and insufficient funds to remediate the radiological contamination to levels that will meet the NRC's license termination criteria. The issue of subsurface residual radioactivity often receives scant attention from licensees during operations because their spills, leaks and effluent releases are typically far below radiation protection standards. In addition, the below ground site surveys are normally done after a facility is permanently shut down. Licensees are able to plan their characterization work, in part, on documentation of spills and leaks that occurred during facility operations. If a licensee first learns of significant subsurface residual radioactivity at the start of decommissioning, after the facility has been shut down and the owner has no operating revenue, there is the possibility of a legacy site. Delays in remediating the subsurface residual radioactivity allow the low-activity radioactive material to spread and further increase the cost to terminate the license.

1.1 Description of the Final Rule

One action evaluated in this Regulatory Analysis is a set of linked amendments to (a) revise 10 CFR 20.1406 to make it applicable to licensees as well as applicants; and (b) revise 10 CFR 20.1501(a) by replacing its undefined term "radioactive material" with "residual radioactivity," a term already defined in 10 CFR Part 20. This defined term includes subsurface contamination within its scope. Due to the need to better ascertain the extent of existing contamination within the subsurface during facility operations, both 10 CFR 20.1406(c) and 20.1501(a) have been worded to include subsurface contamination within their scope. Consistent with this approach, both provisions contain the "residual radioactivity" term, which serves to reinforce the intended linkage between these provisions. These changes are consistent with NRC policy that licensees conduct operations so as to minimize the generation of waste, in order to facilitate later facility decommissioning and to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA) during operations and decommissioning. The purpose of these amendments is to focus licensee attention on subsurface residual radioactivity as a potential radiological hazard in later decommissioning activities.

The second major part of the action is a set of amendments in decommissioning planning and financial assurance requirements in 10 CFR Parts 20, 30, 40, 50, 70, and 72 to better ensure that:

- The licensee has accurate information about its decommissioning work scope and has reported this to the NRC with cost estimates required for license termination, and

- The licensee's decommissioning financial assurance will be available when needed, even if the licensee enters bankruptcy with its assets vulnerable to attachment by creditors.

The amended regulations require licensees to report additional details of their decommissioning cost estimates, including estimated cleanup costs for subsurface contamination. The amended regulations eliminate two currently approved financial assurance mechanisms, and modify the parent company guarantee and Self-Guarantee financial assurance mechanisms to reduce the likelihood that operating facilities will become legacy sites. The amended regulations require decommissioning power reactor licensees to report additional information on the costs of decommissioning and spent fuel management. The set of amendments to change decommissioning planning and financial assurance requirements impose additional information collection and reporting requirements on certain licensees.

1.2 Need for the Final Rule

Existing licensees are already required by 10 CFR Part 20 to have radiation protection programs aimed towards reducing exposure and minimizing waste (Reference 1). The current § 20.1101(a) requires each licensee to implement a radiation program to ensure compliance with the regulations in 10 CFR Part 20. The current § 20.1101(b) requires each licensee to use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA. These operating procedures and controls need to include methods to evaluate potential radiological hazards and to minimize and control waste generation during facility operations, to achieve doses that are ALARA.

Current regulations in 10 CFR 20.1501 give licensees some latitude in using surveys to assess the degree of radiological contamination that may be present at their site. Licensed facilities that have fluid processes typically have effluent releases and minor leaks that, over time, can produce significant amounts of residual radioactivity in the onsite subsurface. Effluent releases are regulated as an annual limit by specific radionuclide in Appendix B of 10 CFR Part 20, and for power reactors in Appendix I of 10 CFR Part 50. Abnormal releases that exceed a regulatory limit are rare at licensed facilities. On the other hand, the accumulation of residual radioactivity from small leaks (e.g., 0.1 gallons per minute) at a facility over a long period of time has been a primary cause of sufficient funds not being available for decommissioning activities. Current Part 50 licensees may operate their facilities as long as 60 years and, as a result, need to diligently document their surveys and recordkeeping to consider waste in the form of residual radioactivity that may affect decommissioning financial assurance. Nuclear power reactor and fuel cycle facility licensees have monitoring systems to identify effluent release and ground-water contamination, and prepare effluent release reports that are available for NRC and public review.

Since 1998, the NRC has required licensees to document radioactive spills and leaks that occur during facility operations and are important to the later decommissioning of the facility. The documentation of these spills, leaks, and onsite abnormal releases into the environment are required in 10 CFR Parts 30.35(g), 40.36(f), 50.75(g), 70.25(g), and 72.30(d). The conditions that qualify a spill or leak as important for decommissioning are site specific, and are widely interpreted. The conditions include radionuclide half-life, quantity, form, concentration, adsorption, and the amount of time the release occurs prior to the start of decommissioning. Regulatory guidance in place before this rulemaking did not specify criteria for reporting these conditions. NRC inspectors have cited byproduct material licensees for not

maintaining adequate records important for decommissioning and to satisfy license termination requirements (Reference 2).

The operators of materials facilities who have a license to possess relatively small amounts of radioactive material are permitted to use a Certification Amount of funding as decommissioning financial assurance. About 150 of these licensees currently use certification as decommissioning funding assurance. The Certification Amount, established by regulation and not often changed, is typically lower than a decommissioning cost estimate especially if there has been a significant spill, leak or abnormal release at the facility. Even if there has been a significant release at a facility, the licensee may decrease its Certification Amount held as decommissioning financial assurance, or remove it altogether, by amending its license to reduce its radioactive material possession limit. This final rule requires the licensee to increase its decommissioning funding assurance following a significant spill if the licensee decides to defer remediation to a later date. Amendments to sections 30.35(c), 40.36(c), and 70.25(c) require materials licensees who experience a significant spill, leak or abnormal release to replace the Certification Amount with a DFP and a decommissioning cost estimate used as the basis for decommissioning financial assurance.

Several materials licensees have fallen short of their decommissioning funding obligations because they assumed, in their license applications, that they would terminate the license under the restricted use provisions of 10 CFR 20.1403, but determined later that they were required to meet unrestricted use under the provisions of 10 CFR 20.1402. An example is the Fansteel site in Oklahoma, where the decommissioning cost estimate was initially for restricted release using onsite disposal of contaminated soils. This resulted in a relatively low estimated decommissioning cost. When Fansteel later found that it was unable to meet the criteria for restricted use with onsite disposal, its auditors required an increase in its decommissioning cost estimate from $4.5 million to $57 million to account for offsite disposal costs for the contaminated soils and Fansteel was unable to raise the additional funds. Prior to this final rule, regulations did not require NRC approval of the licensee's initial decommissioning cost estimate, increasing the likelihood for underestimation of decommissioning costs by materials licensees. Amendments to sections 30.35(e), 40.36(d), 70.25(e), and 72.30(b) and (c) require licensees to plan unrestricted use of the site, unless the licensee demonstrates it can meet the provisions of restricted use, and to submit the DFP to the NRC for review and approval at time of license renewal and at least every 3 years.

Several nuclear power reactor licensees estimated their decommissioning costs to be lower than the actual cost to complete license termination. For example, the Connecticut Yankee Nuclear Plant experienced higher decommissioning costs than planned, due in part to an initial site characterization that underestimated the volume of soil contamination (Reference 3). Other decommissioned nuclear power plants have experienced substantially higher costs than initially estimated. All of these sites have successfully terminated their license at the higher cost because the licensee's status as a regulated public utility provided access to cost of service rate recovery to help provide additional funds. This source of funding for decommissioning may not exist for newly licensed plants whose licensees are permitted to operate as a merchant plant not subject to rate regulation or rate recovery of cost of service. When it ceases operation, a merchant plant may have no source of funds and shortfalls in decommissioning funding may jeopardize timely completion of decommissioning. Amendments to 50.82(a) require power reactor licensees undergoing decommissioning to submit an annual financial status report to identify yearly decommissioning expenditures, the remaining balance of decommissioning funds, and a cost estimate to complete decommissioning.

This final rule has additional reporting requirements for decommissioning power reactor licensees regarding their long-term funding of spent fuel management. Such expenses are at risk of being under-funded by licensees who operate a merchant plant. Regulations prior to the final rule required only one report to be submitted, the Post-Shutdown Decommissioning Activities Report (PSDAR), prior to or within 2-years following permanent cessation of operations. In this one-time report, the licensee must identify its plan to manage and provide funding for spent fuel. There was a risk of this information becoming outdated. Amendments to 50.82(a) require an annual report from decommissioning power reactors identifying the amount of funds accumulated to manage irradiated fuel, and the projected cost of managing the irradiated fuel until title and possession is transferred to the Secretary of Energy.

NRC anticipates that some licensees will be able to demonstrate they are able to meet the provisions of restricted use in 10 CFR 20.1403. For these licensees, the regulations before this final rule allowed financial assurance mechanisms that were typically used in short-term transactions to be used over the long period of time when institutional controls are required to maintain the site. An escrow account, normally used to bridge a short-term financial transaction, is not a long-term financial instrument and may be vulnerable during bankruptcy. Other approved mechanisms are likely to lose their legal standing over the long term. Surety mechanisms, such as insurance and other forms of a guarantee, depend on an enforceable contract or a renewal payment to remain effective. If a contract becomes void because a company ceases to exist, or if an insurance payment is not made, the financial assurance mechanism is no longer viable and the decommissioning financial assurance is gone. An amendment to 20.1403(c) requires a trust fund to be used as the financial assurance mechanism to support restricted release license termination.

There is a risk of investment loss while funds are held in decommissioning financial assurance accounts. Regulations before this final rule did not require the licensee to monitor investment balances in the funds held for decommissioning. Nor were licensees required to replace investment losses in a timely manner if the funding assurance fell below the decommissioning cost estimate. In one case, a licensee estimated its decommissioning cost at $12.5 million and established a decommissioning trust fund using the common stock of a single company. On June 30, 2000, the fund value was $27 million. The fund value was $10 million two years later (Reference 4). Amendments to 30.35(h), 40.36(g), 70.25(h), and 72.30(g) require the licensee to monitor the investment balance and to replenish the fund within a specified amount of time if there is investment loss that reduces the fund below the decommissioning cost estimate.

Before this final rule, two authorized financial assurance mechanisms were considered a risk during corporate bankruptcy. The escrow account is vulnerable to being seized by creditors. The United States Environmental Protection Agency (EPA) concluded that a trust was more protective of funds because, under trust law, the title to property in a trust is transferred to the trustee (46 FR 2802, 2827; January 12, 1981). Thus, escrowed property is more likely to be subject to a creditor's claim than property held in trust. In addition, the law of trusts places obligations on the trustee to act in the interest of the beneficiary. In contrast, an escrow agent is responsible only for what is specified in the escrow agreement. The line of credit is also likely to be vulnerable in bankruptcy. About 20 NRC licensees use the escrow account and none use the line of credit. In Agreement States, at least 12 licensees use an escrow account and fewer licensees are assumed to use a line of credit. This final rule

eliminates the escrow account and the line of credit as approved financial assurance mechanisms.

NRC staff described these and other recommendations for proposed changes to the regulations in SECY-03-0069 (Reference 5). The Commission approved the staff's recommendation to proceed with a proposed rulemaking in its Staff Requirements Memorandum (SRM) SECY-03-0069 dated November 17, 2003.

In 2005 and continuing into 2006, power reactor licensees reported ground-water contamination due to inadvertent release of tritium at the Braidwood, Indian Point and other nuclear plants. Groundwater samples identified high tritium values onsite and offsite at Braidwood, and a likely migration offsite at Indian Point. The NRC Executive Director of Operations established a Task Force on March 10, 2006, in response to these and other unplanned, unmonitored releases of radioactive liquids into the environment. In its Final Report dated September 1, 2006 (Reference 6), the Task Force concluded that the levels of tritium and other radionuclides measured thus far do not present a health hazard to the public, and presented a list of findings and recommendations that the Task Force believed would improve public confidence in nuclear plant operations.

SECY-07-0177, dated October 3, 2007, requested Commission approval to publish a proposed rule consistent with the recommendations approved in SRM-SECY-03-0069. The Commission approved staff's request in SRM-SECY-07-0177, dated December 10, 2007. The proposed rule on Decommissioning Planning was published on January 22, 2008 (73 FR 3812) for a 75-day public comment period. The Nuclear Energy Institute (NEI) and several other stakeholders requested an extension of 90 days to provide review of issues raised in the proposed rule. The NRC extended the comment period by 30 days, until May 8, 2008 (73 FR 14946). The NRC received 35 comment letters on the proposed rule. One comment said that NRC did not include one-time implementation costs in the Regulatory Analysis for certain licensees to become familiar with the final rule changes to 10 CFR 20.1406(c) and 20.1501. The NRC agreed with that comment and has revised the Regulatory Analysis to account for this one-time cost borne by about 500 NRC licensees and about 1,000 Agreement State licensees.

The recommendations in the Reference 6 Final Report are being addressed by NRC program offices, but one recommendation is being completed in concert with this final rule to improve decommissioning planning. That is to develop guidance to define acceptable methods to survey and monitor ground water and subsurface soil for radionuclides (Reference 7).

2. TECHNICAL BASIS FOR THE FINAL RULE

Section 2.1 identifies the technical basis for amendments to clarify regulations associated with residual radioactivity. A predictable basis for decommissioning planning is the intended result.

Section 2.2 identifies the technical basis for amendments to decommissioning financial assurance regulations and reporting requirements.

2.1 Residual Radioactivity

The technical basis for changes to regulations related to residual radioactivity is organized below in four groups of sources: (1) stakeholder input collected during public meetings; (2) staff assessments; (3) risk assessments and regulatory guides; and (4) regulations prior to this final rule. Residual radioactivity issues at certain types of licensees, and the extent to which the amendments would affect these licensees, are then discussed.

<u>Stakeholder Input at Public Meetings</u>

On April 20-21, 2005, NRC sponsored a decommissioning workshop (Reference 8) that about 135 stakeholders attended. One session was dedicated to operating changes that would reduce the likelihood of legacy sites. Stakeholders were generally supportive of the position that facilities that have significant subsurface contamination are at risk of a shortage of funds for decommissioning, and that additional reporting requirements may be required of licensees that have a potential for subsurface contamination. Licensees whose processes used large volumes of water were considered at risk for subsurface contamination. The transcript and summary notes of this meeting were posted to the NRC web site at the following location: http://www.nrc.gov/about-nrc/regulatory/decommissioning/public-involve.html.

On January 10, 2007, NRC sponsored a public roundtable meeting (Reference 8), attended by 40 stakeholders. Some stakeholders said that NRC ground-water monitoring requirements, for the purpose of addressing the risk of subsurface contamination on the decommissioning cost estimate, should be done on a license condition basis as needed based on spills, leaks and abnormal releases reported by a licensee. Some stakeholders also said that subsurface contamination was not a significant element of total decommissioning costs, and that the uncertainty in cost of contaminated soil disposal was more significant than the volume of contaminated soil or ground water. The transcript and summary notes of this meeting are noted in Reference 8. NRC is proceeding with this final rule to ensure that those of its licensees who are required to have decommissioning financial assurance are aware of significant subsurface residual radioactivity at their sites, and have factored this into their decommissioning planning. NRC experience indicates that sites with greater than anticipated subsurface contamination have significantly higher decommissioning costs than planned, in excess of the funds assured using a planned contingency factor.

<u>Staff assessments</u>

In 2005, NRC staff conducted an evaluation (Reference 9) of 82 active and completed decommissioning sites to identify the key operational and technical issues which underlie legacy sites. The evaluation concluded that low level specific activity radioactive process leaks, spills, and controlled and uncontrolled effluents were common to legacy sites. Over the short-term,

these are below the threshold for reportable effluent release. Over the long-term, these chronic releases accumulate in the subsurface environment and are often not considered for remediation in the decommissioning cost estimate, upon which decommissioning financial assurance is based. Staff qualitatively considered three elements of the risk related to subsurface contamination: (1) what can go wrong at current operating sites, based on knowledge of past operating experiences at similar sites that have undergone (or are undergoing) decommissioning; (2) how likely are future events, based on current operating practices and/or the existence of same or similar operations within the U.S.; and (3) what is the potential for future subsurface contamination at current operating sites. Staff assembled a list of currently decommissioning sites and recently completed decommissioned sites and surveyed cognizant NRC project managers to ascertain whether ground water and/or subsurface contamination exists at these sites. Even if the presence of contamination was identified, NRC staff did not collect data to determine whether or not the dose levels from concentrations were above or below any regulatory standards, limits or guidelines. Where such contamination did exist, the project managers were asked to identify which radionuclides were present and the potential origin or source of the contamination. Of the 82 sites evaluated, 54 had subsurface contamination and ground-water contamination. The evaluation concluded that the following types of sites were generally at higher risk of becoming future legacy sites and were recommended for detailed analysis:

- Power reactors
- Test and research reactors
- Fuel manufacturing facilities
- Depleted uranium munitions manufacturing and testing sites
- Sewage treatment plants

In 2006, the NRC's Executive Director for Operations chartered a lessons-learned task force (Reference 6) to review incidents of inadvertent releases of radioactive liquids to the environment from nuclear power plants. The task force was assembled in response to low specific activity tritium releases at power reactors. Tritium has a half-life of 12.5 years and is a weak beta emitter. The Liquid Radioactive Release Lessons Learned Task Force (LRR LLTF) Final Report was an assessment of these radioactive liquid releases that were neither planned nor monitored. The Final Report covered releases from 14 nuclear power plants going back to a release discovered in December 1986. The Final Report identified a large volume of subsurface and ground-water tritium contamination from power reactors due to undetected leaks in spent fuel pools, component cooling water tanks, condensate holding tanks, refueling water storage tanks, borated water storage tanks, buried piping, and ventilation systems. It also identified other radionuclides, including mixed fission products, cobalt-60, cesiums-137, and strontium-90, that were inadvertently released into the onsite environment at two power plants. At Callaway, radioactive cobalt and cesium were detected in surface soil inside manholes where the isotopes were believed to have leaked from air-relief valves for the blowdown discharge pipeline. At Indian Point, the isotopes were suspected to have leaked from the Unit 1 spent fuel pool where fuel assemblies with potentially degraded cladding were stored until September 2008. The recommendations in the Final Report are being addressed by NRC program offices, with the following four relevant to this analysis:

- NRC should evaluate the need to enact regulations and/or provide guidance to address remediation.
- NRC should require adequate assurance that leaks and spills will be detected before radionuclides migrate offsite via an unmonitored pathway.

- NRC should develop guidance to define the magnitude of the spills and leaks that need to be documented by the licensee under 10 CFR 50.75(g). Also clearly define "significant contamination." Summaries of spills and leaks documented under 10 CFR 50.75(g) should be included in the annual radioactive effluent release report.
- NRC should develop guidance to define acceptable methods to survey and monitor onsite ground water and subsurface soil for radionuclides.

Risk Assessments and Regulatory Guides

NUREG-1496, the final Generic Environmental Impact Statement (GEIS) (Reference 10) supporting the 1997 rulemaking that added Subpart E to 10 CFR Part 20, analyzed the costs and benefits of different dose estimates for potential radionuclide contamination levels at time of license termination. The analysis was done for the following four reference facilities: nuclear power plant, uranium fuel fabrication plant, sealed source manufacturer, and a rare metal extraction facility. Appendix C of the GEIS presented an analysis of ground-water remediation with licensees divided into three classes based on their likelihood for significant soil and ground-water contamination:

- Little contamination and very low potential for soil and ground-water contamination: sealed source manufacturers, short-lived radionuclide users, and other small licensees with little contamination, including small research reactors.
- Low to Medium indicators for soil and ground-water contamination: research reactors, certain sealed source manufacturers, broad scope R&D facilities, and some power reactors.
- Medium to High indicators for soil and ground-water contamination: complex decommissioning sites, large uranium/thorium facilities, and some power reactors.

Of the three types of licensees identified in the GEIS as having Medium to High indicators for soil and ground-water contamination, only rare earth extraction facilities licensed under 10 CFR Part 40 are considered plausible candidates to be affected by final rule amendments to 10 CFR 20.1406 and 20.1501. Complex decommissioning sites and power reactors are not considered plausible candidates to be affected by the amendments, by the effective date of the final rule, because these licensees have implemented effective ALARA prevention and monitoring programs to identify residual radioactivity in areas at their sites. Uranium recovery facilities including solution mining facilities are not affected by the amendments to 10 CFR 20.1406 and 20.1501, as discussed in the final rule *Federal Register Notice*.

SECY-00-0048, dated February 24, 2000, provided the results and staff plans for use of a completed risk analysis for nuclear byproduct material regulated under 10 CFR Parts 30 through 36 and 39 (Reference 11). This was an assessment of radiological risk associated with 40 different nuclear byproduct material systems. Radiological risk was defined in terms of dose calculations to workers and to the public under normal and off-normal conditions. Other risks were considered, including "contamination cost," which was the potential for environmental release. Of the 40 systems, only the Waste Disposal (incineration) system was considered a High contamination risk because of the potential loss of confinement or spills during incineration of mixed wastes, which have biohazard or chemical hazard with radiological hazard. Since 2000, there has been no evidence of significant spills or leaks from incinerated waste processes and these types of releases are not chronic. As a result, Waste Disposal by incineration is not considered a plausible candidate as an affected licensee in this Regulatory Analysis.

Regulations Prior to this Final Rule

10 CFR 20.1406(a) and (b), Minimization of Contamination, applies only to license applicants, not to operating facilities. These sections identify reporting requirements during license application. Regulatory Guide 4.21, Minimization of Contamination and Radioactive Waste Generation in Support of Decommissioning, provides guidance to assist license applicants in effectively implementing those reporting requirements (Reference 13).

Prior to this final rule, 10 CFR 20.1501 required licensees to conduct surveys that are reasonable under the circumstances to evaluate the extent and concentrations of radioactive material and potential radiological hazards, throughout the site. Licensee practice prior to this final rule had been to conduct surveys when needed for occupational dose assessment, not for environmental records important to decommissioning.

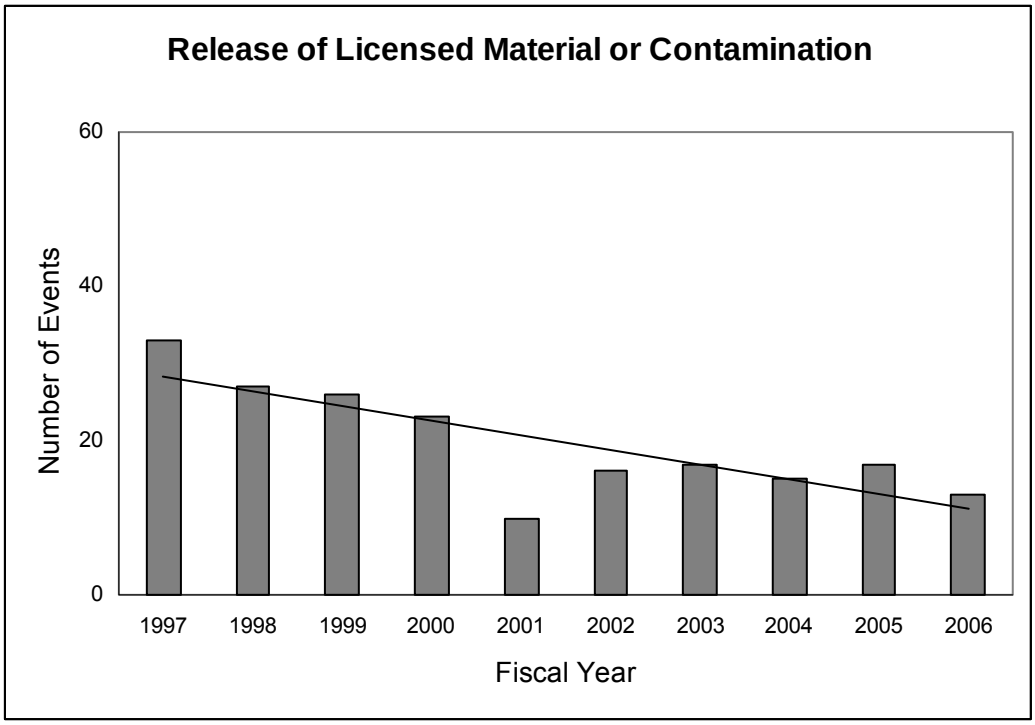
Appendix A of 10 CFR 50, General Design Criteria Number 64, Monitoring Radioactivity Releases, requires the nuclear power reactor licensee to monitor "the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents." Licensee practice has not included monitoring releases to the subsurface (e.g., from subsurface tanks and transfer lines). As a result, there are few historical data files of subsurface contamination at power reactor sites.

10 CFR 30.35(g), 40.36(f), 50.75(g), 70.25(g), and 72.30(d) require the licensee to collect and maintain records important for decommissioning. These records should be kept for spills, leaks and other unusual occurrences that result in the spread of contamination, after cleanup procedures, or if the contamination is likely to have spread to inaccessible areas. Licensees' practices vary widely concerning what should be documented because of the great diversity of radioactive materials handled and different site conditions. For example, even large spills of short-lived isotopes may not be considered important to decommissioning, and not documented, because the spill will have decayed to acceptable license termination levels before decommissioning begins. These records are maintained by the licensee and are not required, by regulation, to be reported to the NRC. However, the fuel cycle facilities licensed under Parts 40 and 70 are required (10 CFR 40.65 and 70.59) to report effluent data to the NRC on a semi-annual basis. The conclusion from evaluation of this data reported over the past 10 years is that the 6 nuclear fuel fabrication facilities and the single UF_6 conversion facility have consistently maintained their effluent releases to the environment well below regulatory limits.

The Nuclear Material Events Database (NMED) was reviewed for this Regulatory Analysis. NMED contains "events", reportable by NRC and Agreement State licensees, from January 1990 to the present. NRC and Agreement State licensees are required to report any radioactive material release to the environment that exceeds regulatory limits. Of the nine categories of NMED event types, the "Release of Licensed Material or Contamination" (RLM), is relevant to this Regulatory Analysis. The NMED Report for the Fourth Quarter FY 2006 (dated January 2007) identified 197 RLM events from FY 1997 through FY 2006. The trend of these events shown in Figure 2-1 represents a statistically significant decrease in the number of events per year. The majority of the decrease in events is due to a decrease in surface contamination. About 39 percent of the RLM events shown in Figure 2-1 involved other types of contamination (air, water or personnel) – an RLM event can involve more than one release type. The NMED data confirm a low level of reportable releases from all licensees. The unit of measure in reporting the release is the likelihood of the RLM being an "Abnormal Occurrence" which is a dose-based standard. Although there is a low and decreasing level of reportable

releases by licensees, experience has shown that significant quantities of residual radioactivity may still accumulate at sites over a long period of facility operations at certain types of licensed facilities with the potential for subsurface contamination.

Figure 2-1
Long-Term Trend of Release of Licensed Material or Contamination Events



Source: NMED Quarterly Report, 2006 4Q, page 14.

2.1.1 Nuclear Power Reactors

There are 104 nuclear power reactors at 64 plant sites. Reference 6 identifies current NRC regulations and regulatory guidance that require power reactor licensees to maintain adequate control over radioactive effluent discharges and identifies the characteristics of licensees' radiological environmental monitoring programs (REMP). The results of each licensee's REMP and effluent controls program are reported to the NRC on an annual basis. The REMP generally does not include onsite monitoring wells, because onsite ground-water monitoring for general detection and monitoring purposes is only required if the ground water at the site is tapped for drinking or irrigation purposes.

Reports of residual radioactivity and ground-water contamination events at power reactors occurred in late 2005 (Reference 6). In response, the Nuclear Energy Institute (NEI) worked with licensees to develop voluntary guidance, referred to as the Ground Water Protection Initiative (GPI) (Reference 14). Information about the GPI is in section 6 of this Regulatory Analysis. The voluntary GPI, if implemented by licensees, includes site characterization of geology and hydrology to provide an understanding of predominant ground water gradients based upon current site conditions, a site risk assessment, and sampling and

analysis protocols for ground water and soil. In May 2008, NRC staff issued Temporary Instruction 2515/173 in its Inspection Manual to review the implementation of the industry GPI. The Temporary Instruction is publicly available in ADAMS (ML072950622).

Power reactor licensees must provide decommissioning financial assurance from the time of license application through plant operations until completion of decommissioning and license termination. Licensees are required to submit periodic reports to the NRC on the status of their decommissioning financial assurance. Regulatory Issue Summary 2006-09 (Reference 15) identifies NRC's procedure to review the biennial decommissioning funding assurance reports submitted by the power reactor licensees. Most power reactor licensees are regulated electric utility companies (i.e., Category 1 licensees), who either: (1) recover the estimated total cost of decommissioning through rates established by cost of service regulation; (2) are able to establish their own rates and are able to recover all of their decommissioning costs; or (3) are able to recover the total cost of decommissioning from non-bypassable charges. "Merchant" power reactor licensees (i.e., Category 2 licensees) are non-electric utilities and have no regulatory authority to collect decommissioning funds. As of the end of 2006, there were 11 Category 2 power reactor licensees. To date, all of the decommissioned power reactors that have terminated their licenses were owned and operated by Category 1 licensees. Although some of the licensees that have terminated their licenses have had significantly higher than planned decommissioning expense, none were considered a potential legacy site because of the licensee's access to state-regulated recovery of funds for decommissioning.

The same certainty of funds to complete license termination does not exist for the Category 2 licensees, even though these licensees must post a prepayment, during license application, of the amount estimated for decommissioning costs. For example, the Category 2 licensee may need more funds than what is in the decommissioning financial assurance to complete license termination. It is, and will continue to be, important for NRC staff to ensure that the licensee has performed diligent and accurate decommissioning planning to serve as the basis for decommissioning financial assurance.

NRC staff considered the technical basis information in section 2.1, and concludes that the monitoring and survey processes and related reports prepared at power reactor sites likely would provide sufficient information to satisfy the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule. NRC is not requiring licensees to submit reports but the information must be available for review. It is not expected that power reactor licensees will need to install new capital or modify existing operating procedures to satisfy the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule.

The amendment to 10 CFR 20.1406(c) is consistent with the requirements imposed on license applicants under 10 CFR 20.1406(a) and (b). NRC has published guidance for license applicants to implement a program to satisfy those requirements (Reference 13). NRC is publishing guidance with this final rule for licensee implementation of 10 CFR 20.1406(c), as noted in Reference 7.

2.1.2 Research and Test Reactors

There are about 30 operating research and test reactors (non-power reactors) and about 15 permanently shut down research and test reactors licensed by NRC. Non-power reactors are much smaller than power reactors and are used for research, testing, training, and can be

used to produce irradiated target materials. There are also compact, self-contained, low-power (less than 5 watts) tank-type reactors.

In Reference 9, research and test reactors were considered high risk facilities for subsurface contamination because survey results showed several instances of ground-water contamination. Some research and test reactors have buried piping and ventilation systems that are located outside the reactor building and may contain low specific activity contaminated liquid. In addition, neutron activation in the zone surrounding the reactor core was considered a potential source of subsurface contamination. As described in Reference 9, NRC visited a total of 17 research and test reactors and found evidence of ground-water contamination at two (University of Virginia and Westinghouse Waltz Mill).

During the public meeting on January 10, 2007 (Reference 8), representatives from research and test reactors disputed the conclusion in Reference 9 that research and test reactors are a high risk for subsurface contamination. Instead, they said that ALARA procedures are enforced by reactor personnel, there have been no significant incidents at any of the currently operating reactors, and the coolant water in these types of reactors is well below the dose criterion for unrestricted use following license termination.

NRC staff reviewed inspection reports of currently operating research and test reactors. These reports supported the licensee statements made at the January 10, 2007, public meeting. The inspection reports show minimal effluent release. In addition, the NMED data over the period 1991 to 2006 for release type of "Water" showed only one reportable event at a research and test reactor which occurred in April 1996 and was for a discharge of 84 mCi of insoluble radioactive material to municipal sewage. This discharge is not significant for decommissioning planning. The current inspection experience supports a conclusion of minimal effluent release from currently operating research and test reactors.

NRC staff considered the technical basis information in section 2.1 and concludes that none of the research and test reactor licensees will be affected by the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule. Additional monitoring and reporting could be required at these facilities after the effective date of the final rule if significant residual radioactivity is identified above current levels.

2.1.3 Uranium Fuel Fabrication Plants

There are 6 operating uranium fuel fabrication plants licensed by the NRC. Five of the plants receive UF_6 enriched in its uranium-235 isotope to less than 5 weight percent, chemically convert the enriched feed material into uranium oxide pellets, load the pellets into fuel rods, and prepare the completed fuel bundles for shipment to power reactors. One of the plants, Areva Lynchburg, does not have chemical conversion processes because it starts its fabrication production by receipt of uranium oxide pellets, as feed material, which have been produced at a different plant.

Reference 9 considered uranium fuel fabrication plants with chemical conversion processes a high risk for subsurface contamination. The chemical conversion process sometimes uses large amounts of uranium-bearing liquids. There was also a tendency in the past for these plants to use low-level radioactive waste treatment lagoons that leaked into the subsurface and ground water. Several also used low-level waste burial practices, permissible at the time. In preparing Reference 9, NRC visited 13 fuel fabrication plants and found evidence

of ground-water contamination at 7 of these plants, all of which are currently in a decommissioning status. The Salmon River site, in North Fork, Idaho, has the potential to become a legacy site with about 9 million cubic feet of contaminated soil.

Reference 8 cites comments, made at the January 10, 2007, public meeting, from representatives of operating uranium fuel fabrication plants who dispute the conclusion that any of these operating plants are a high risk of becoming a legacy site due to subsurface contamination. Instead, they said that ALARA procedures are enforced by their management and operating personnel. They suggested that their environmental monitoring and liquid effluent releases are evidence of low releases to the environment, in most cases substantially lower than allowed under regulations. These effluent releases are reported semi-annually to NRC, as a requirement of 10 CFR 70.59.

NRC staff reviewed the effluent reports at the 5 uranium fuel fabrication plants that have uranium chemical conversion processes. These reports show negligible effluent release over the period January 1999 through December 2006. NRC staff also reviewed the NMED reports over the period 1991 to 2006 for release type of “Water” and there was only one reportable event at uranium fuel fabrication plants. This event was for discharge of 1.2 μCi of insoluble low-enriched uranium from its contaminated laundry cleaning facility to municipal sewage. This record of minimal effluent release is not significant for decommissioning planning and reinforces the statements made by representatives from fuel fabrication facilities during the January 10, 2007, public meeting.

NRC staff considered the technical basis information in section 2.1, and concludes that the existing monitoring and survey processes and related reports prepared at uranium fuel fabrication plants would likely contain sufficient information to satisfy the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule. NRC is not requiring licensees to submit reports but the information must be available for review. It is not expected that uranium fuel fabrication plant licensees will need to install new capital or modify existing operating procedures to satisfy the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule.

The amendment to 10 CFR 20.1406(c) for operating facilities is consistent with the requirements imposed on license applicants under 10 CFR 20.1406(a) and (b). NRC has published guidance for license applicants to implement a program to satisfy those requirements (Reference 13). NRC is publishing guidance with this rule for licensee implementation of 10 CFR 20.1406(c) as noted in Reference 7.

2.1.4 Critical Mass Facilities

The licensees of critical mass facilities include universities, a Federal government agency, and other institutions that may use small quantities of special nuclear material in classroom demonstrations, laboratory experiments, and to provide health physics support to other institutional nuclear materials users. Eight of these facilities are licensed under 10 CFR Part 70, and 6 of these 8 are required to have decommissioning financial assurance.

Reference 9 did not cite these research facilities as a high risk for subsurface contamination. NRC staff reviewed the NMED reports over the period 1991 to 2006 for release type of “Water” and these showed no reportable events at the critical mass facilities.

NRC staff considered the technical basis information and concludes that none of the critical mass licensees will be affected by the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule. Additional monitoring and reporting could be required at these facilities after the effective date of the final rule if significant residual radioactivity is identified above current levels.

2.1.5 Decommissioning and Permanently Shutdown Facilities

The licensee of a facility that permanently shuts down submits a license amendment request to have its decommissioning plan approved by the NRC. The regulations in Subpart E of 10 CFR 20 identify monitoring and survey requirements for these sites. The regulatory guidance in NUREG-1757,consolidated decommissioning guidance, Volumes 1 through 3, provides acceptable survey methodology to complete license termination. The monitoring and survey requirements are already defined for decommissioning and permanently shut down facilities. As a result, none of these licensees are affected by the amendments to 10 CFR 20.1406(c) or 20.1501.

2.1.6 Fuel Enrichment Plants

The two Department of Energy (DOE) gaseous diffusion plants, leased for operation by United States Enrichment Corporation (USEC), are certified under 10 CFR Part 76. Both facilities have substantial subsurface and ground water contamination from operations during the time these facilities were under the control of the Atomic Energy Commission and the DOE, and prior to certification by NRC. The DOE is currently conducting an extensive ground water monitoring program at both plants. In addition, decommissioning of the gaseous diffusion plants is the responsibility of DOE.

10 CFR part 76 regulations do not require USEC to submit effluent reports. However, since 2001, USEC has provided copies of the annual National Emissions Standards for Hazardous Air Pollutants (NESHAP) radionuclide emissions reports to the NRC for both gaseous diffusion plants.

NRC staff reviewed the recent radionuclide emissions reports from the gaseous diffusion plants. These reports show negligible effluent release through 2006. NRC staff also reviewed the NMED reports over the period 1991 to 2006 for release type of “Water” and found no reportable events at the gaseous diffusion plants.

NRC staff considered the technical basis information and concludes that neither of the gaseous diffusion plants will be affected by the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule.

Gas centrifuge enrichment plants do not use large amounts of fluids in their production processes and are not, at this time, thought to pose risks of subsurface contamination. Louisiana Energy Services received a license from NRC in June 2006, to construct and operate a gas centrifuge uranium enrichment plant in Lea County, New Mexico. USEC received a license from NRC in April 2007, to construct and operate a gas centrifuge uranium enrichment plant in Piketon, Ohio. NRC staff concludes that the gas centrifuge enrichment plants will not be affected by the amendments to 10 CFR 20.1406(c) or 20.1501 because they do not use large amounts of fluids in their production processes. Additional monitoring and reporting could

be required at these facilities after the effective date of the final rule if significant residual radioactivity is identified after the plants begin their operations.

2.1.7 UF_6 Production Plants

There is one UF_6 conversion/de-conversion plant with an NRC operating license. The plant is located in Metropolis, Illinois, and is not considered a risk for subsurface contamination.

Reference 9 did not cite UF_6 production plants as a high risk for subsurface contamination. NRC staff reviewed the NMED reports over the period 1991 to 2006 for release type of "Water" and found no reportable events at this production plant.

The licensee of the plant maintains a routine ground-water compliance monitoring network that consists of ten wells - two upgradient, seven downgradient, and a tenth well that is used for ground water surface elevation determination only. The licensee collects and analyzes samples from the nine monitoring wells quarterly for pH, specific conductance, fluoride, gross alpha and gross beta. The results are routinely reported to the State of Illinois environmental protection agency.

NRC staff concludes that the UF_6 conversion/de-conversion plant will not be affected by the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule. Additional monitoring and reporting could be required at this facility after the effective date of the final rule if significant residual radioactivity is identified above current levels.

2.1.8 Uranium Mills, Solution Mining Facilities, and Sewage Treatment Plants

Uranium mills and solution mining facilities, known as in-situ leach (ISL) facilities, are licensed by NRC under 10 CFR Part 40 Appendix A. Reference 9 concluded that uranium mills were a high risk of subsurface contamination because of the large amounts of liquids and uranium and thorium bearing ores. Uranium mills and ISL facilities are required to install ground-water monitoring wells and to have process leak detection methods under 10 CFR Part 40, Appendix A, Criterion 5 and Criterion 7. Criterion 7A is the requirement for subsurface monitoring to detect leaks of hazardous constituent material. Criterion 5 incorporates the ground water protection standards imposed by the EPA under 40 CFR Part 192 which apply during operations and prior to the end of mill closure. Because of these monitoring activities at sites licensed under 10 CFR Part 40 Appendix A, these sites are not affected by the changes to 10 CFR Part 20.1501(a) in this final rule.

10 CFR 40.65 requires uranium mill and ISL licensees to submit semi-annual effluent reports identifying the quantity of each principal radionuclide released to unrestricted areas. The NMED reports over the period 1991 to 2006 for solution mining show only one reportable event. This event was for a leak in an injection well. The leak breached a diversion berm and entered a creek. The maximum release was estimated to be 38.8 μCi for radium-226 and 78.9 μCi for natural uranium. These releases are not significant for decommissioning planning.

Sewage treatment plants were identified in Reference 9 as a high risk of subsurface contamination based on the large volume of water processed at these plants. Reference 9 does not mention an extensive study by the Interagency Steering Committee on Radiation Standards (ISCORS) (Reference 16), done in November 2003. The ISCORS conclusions, based on over 300 samples collected from publicly owned treatment works (POTWs), were that

no excessive concentrations of radioactive material were observed in the sewage sludge or ash and that no widespread concern to public health and safety was identified. The concentration of radioactive material at POTWs primarily contained naturally occurring radioactive material such as radium, and most of the samples other than those containing radium were at or near the limit of detection and comparable to what is found in soil and fertilizer. In a related activity, the Commission approved staff's denial of petition for rulemaking in SECY-04-0226 (Reference 17) that was submitted by the Northeast Ohio Regional Sewer District. Although the petition was based on concern for public health and safety, NRC staff considered in its review of the petition related issues regarding long-term effects of releases of radioactive materials into sanitary sewer systems. The staff concluded that no widespread public health and safety risk exists from releases of licensed materials into sanitary sewer systems under the current regulatory structure. Since then, ISCORS has released guidance for a POTW if it encounters a concern with radioactive materials in its sewer systems. This guidance is available at http://www.iscors.org/pdf/FinalRecommendations.pdf

NRC staff concludes that the existing programs of uranium recovery licensees satisfy the final rule survey and monitoring requirements because there are no changes to uranium recovery requirements for surveys and monitoring. The requirements for uranium recovery monitoring are combined in Part 20 and Part 40, Appendix A, as has been the case previous to this rulemaking. Sewage treatment plants will not be affected by the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule. Additional monitoring and reporting could be required at these types of facilities after the effective date of the final rule if significant residual radioactivity is identified above current levels.

2.1.9 Source Material Facilities Other Than Mills and ISL's

There are other NRC and Agreement State licensees that possess or use source material for purposes other than milling or production of uranium or thorium. These other types of source material facilities use uranium or thorium to fabricate a product or to perform tests on the characteristics of these metals in different commercial and military uses. These licensees also may be involved in rare earth extraction and manufacturing processes.

In the past, a few source material facilities were responsible for abnormal and chronic releases of residual radioactivity to the subsurface environment. In general, these facilities were never issued an NRC license and others terminated their licenses prior to NRC regulations in 1988 to establish decommissioning financial assurance. The contaminated areas included ground-water contamination at low concentration levels with the very long uranium and thorium half-lives.

There are currently about 30 NRC licensees holding source material licenses that are not engaged in uranium milling or ISL operations. These facilities have similar operating characteristics compared to some of the sites evaluated in Reference 9 that were considered a high risk for subsurface contamination.

NRC staff assumes that one rare earth extraction and manufacturing licensee will be affected by the amendments to 10 CFR 20.1406(c) and 20.1501. An assumption is made that four Agreement State rare earth extraction and manufacturing licensees will be affected by the final rule. The specific input assumptions used in a cost-benefit analysis of the final rule amendments are described in Section 4 of this document. The results are presented in Section 5 of this document.

2.1.10 Byproduct Material Facilities

Reference 9 noted that among the byproduct material facilities, subsurface and ground-water contamination was caused primarily from permissible onsite burials under the now-rescinded regulations in 10 CFR 20.304. Reference 9 stated that currently operating byproduct material sites were not expected to be legacy sites because of more effective waste disposal regulations implemented in 10 CFR Parts 20 and 61.

Among the byproduct material facilities, there are about 300 broad scope academic and R&D licensees with long-lived radionuclides. The very large majority of broad scope licensees have an active and thorough program for detection of residual radioactivity during operations and for the survey and release of laboratories during decommissioning. NRC staff reviewed the NMED reports over the period 1991 to 2006 for release type of “Water” and found 2 reportable events, both in the year 2000, at these types of facilities. One was at the University of Oklahoma, where the licensee reported an unauthorized release (injection) of 65 µCi of sulphur-35 (S-35) labeled sodium sulfate into a test injection well. The licensee attempted to recover the radioactive material from the test injection well and was able to recover about 80 percent of the total S-35 approximately three weeks after the injection. The remaining activity was less than the limits specified in 10 CFR 20.1302 and Table 2 of Appendix B to 10 CFR 20. The other reportable event was at the University of Chicago, where the licensee reported the loss of a one-gallon jug of aqueous tritiated thymidine containing 3.3 mCi of H-3. The licensee's investigation revealed that, because of limited space at the facility, the storage room was shared by several researchers, one of whom inadvertently poured the material down the sink and placed the original container into a dry solid waste container. To prevent recurrence, the licensee enhanced the security, inspection, and storage conditions in their laboratories.

NRC staff considered the technical basis information and concludes that none of the byproduct material broad scope academic and R&D licensees will be affected by the amendments to 10 CFR 20.1406(c) and 20.1501, by the effective date of the final rule. Additional monitoring and reporting could be required at these facilities after the effective date of the final rule if significant residual radioactivity is identified above current levels.

Also among byproduct material facilities, an additional 100 new NRC licenses are expected by the year 2010 as a result of a final rule establishing regulations for certain radium sources, accelerator-produced radioactive material, and certain discrete sources of naturally occurring radioactive material (hereafter referred to as NARM). The NARM final rule regulates radium-226 as a discrete source and adds a general license category for any person to possess, among other items, luminous gauges and other items containing radium-226 installed in air, marine, or land vehicles including any former military use vehicle no longer in control of the military. The general license requires the disposal of the product only by transfer to a *specific licensee* authorized to receive it or to a disposal facility authorized to dispose of the material in accordance with any Federal or State solid or hazardous waste law. Applicants for specific licenses to possess discrete sources of radium-226 will need to evaluate the requirement to obtain decommissioning financial assurance based on their licensed possession limit for radium-226. The requirement is based on a minimum possession limit of 1 µCi of Ra-226, which may represent a single gauge used for industrial purposes. The NRC and Agreement States are aware of the existence of facilities and sites which have the potential to become contaminated with significant amounts of radium-226 from past practices or operations, or from the accumulation of significant quantities of radium-226 discrete sources. The NRC and

Agreement States will address these situations on a case-by-case basis as they are identified following the effective date of the NARM final rule. At this time, there is not enough information to include these sites in the final rule Regulatory Analysis as licensees affected by changes to 10 CFR 20.1406(c), 20.1501, and 30.35(e).

2.2 Financial Assurance

The technical basis for changes to regulations related to decommissioning financial assurance and reporting requirements is organized below in four groups of sources: (1) stakeholder input collected during public meetings; (2) staff assessments, (3) risk assessments and regulatory guides, and (4) current regulations.

Stakeholder Input at Public Meetings

The workshop on April 20-21, 2005, (Reference 8) was intended to provide program evaluation and stakeholder feedback on a wide range of decommissioning topics. One of the breakout sessions on the first day included detailed discussions of potential changes to financial assurance and changes to facility operations to prevent future legacy sites. The second day was devoted to discussions of decommissioning lessons learned. The workshop was specifically designed to provide stakeholder input for future rulemaking and development of supporting guidance (e.g., revisions to NUREG-1757) to prevent future legacy sites.

In the financial assurance breakout session: stakeholders discussed 8 topics: (1) whether off-balance-sheet liabilities should be included in the evaluation of parent company and self-guarantees; (2) the frequency of monitoring and adjustment of decommissioning funds; (3) protection of decommissioning funds in bankruptcy; (4) the level of assurance provided by corporate parent guarantees; (5) whether onsite property damage insurance should be required; (6) should NRC formally approve decommissioning cost estimates; (7) should decommissioning cost estimates be based on unrestricted release criteria; and (8) what type of fund status reports should NRC receive for permanently shutdown reactors undergoing decommissioning? A wide range of viewpoints were expressed that the NRC staff has taken into account in developing this final rule.

The lessons learned component of the workshop also identified factors affecting decommissioning that are being addressed in this final rule. One of these is that especially severe decommissioning problems may occur when significant site contamination is first detected during or shortly before decommissioning. In such cases, revenues from the facility's operations may be insufficient to increase the decommissioning financial assurance to the level needed. Adequate advance planning and reporting are therefore important to prevent such problems.

In the public roundtable meeting on January 10, 2007, about 40 stakeholders addressed similar financial assurance issues as those discussed in 2005. A new topic was whether firms providing a parent guarantee or self-guarantee should also be required to provide collateral to secure the funds promised in the guarantee. Stakeholders raised a number of issues related to this topic. They pointed out that the collateral would need to be monitored, that collateral in the form of real property would be particularly problematic, that conflicts could arise over collateral pledged to more than one purpose, that pledges of collateral could place considerable operating constraints on firms and raise their cost of borrowing to obtain working capital, and that setting up collateral in inventory and accounts receivable would impose significant transaction costs.

Stakeholders also argued that in many cases requiring very large firms providing parent guarantees to also supply collateral would not measurably increase the level of assurance provided to NRC. One stakeholder argued that bankruptcy of a subsidiary would be unlikely to affect the degree of assurance provided by its parent. Several stakeholders encouraged NRC to amend the financial tests associated with the guarantees, if necessary, rather than adopting a collateral requirement. Stakeholders also encouraged NRC to retain the possibility for firms to self-guarantee.

A second new topic addressed in the January 2007 stakeholder meeting was whether the definition of net worth should be changed to allow intangible assets to be counted in determining whether a firm passes the financial test for parent guarantee or self guarantee. One stakeholder asserted that modern accounting standards, including Financial Accounting Standard 142, have evolved to the point that intangible assets can be valued accurately, that the net worth of many large conglomerate firms includes large amounts of intangible net worth because they have grown by acquisition, and that intangible net worth can be assessed in association with other financial indicators such a strong bond ratings. Another stakeholder stressed that the intangible asset consisting of intellectual property may include patents and regulatory licenses and approvals, and therefore can be both liquid and valuable. Stakeholders also stated that intangible assets were not inherently more likely than tangible assets to lose value quickly.

Stakeholders did not express concerns when the topic of eliminating the escrow account as a financial assurance mechanism was raised. One stakeholder with an escrow account stated that it did not foresee any difficulties in shifting to an alternative mechanism. Some stakeholders requested that the NRC allow as wide a possible range of options for financial mechanisms, to provide flexibility for licensees.

Stakeholders at the January 2007 workshop generally did not oppose the codification of existing NRC guidance regarding the development and contents of the DFP. Stakeholders, with few exceptions, agreed that planning for decommissioning and decommissioning cost estimates should be based on the costs of having an independent contractor perform the work, and that cost estimates should be based on unrestricted release criteria. Stakeholders did request that NRC provide a more detailed discussion and analysis of any proposed new reporting requirements for reactors that have submitted a certificate of permanent cessation of operations.

Staff Assessments

NRC staff reviews decommissioning cost estimates and financial assurance mechanisms submitted by licensees to provide decommissioning financial assurance. The NRC has addressed financial assurance issues in a revision to the current guidance on decommissioning in NUREG-1757, Volume 3, Appendix A.

NRC has performed several lessons-learned studies addressing various aspects of decommissioning and financial assurance. A September 2003 program evaluation of the NRC's decommissioning program for materials licensees provided an overall evaluation of program effectiveness and a roadmap of ongoing and future improvements (Reference 18). Subsequent initiatives included an Integrated Decommissioning Improvement Plan for fiscal years 2004 to 2007 (Reference 19) and an analysis of implementation issues impacting the decommissioning of sites under the License Termination Rule (10 CFR 20 subpart E) (Reference 20). The latter,

in NRC Regulatory Issues Summary 2004-08, results of the License Termination Rule Analysis, described staff experience with sites licensed before the financial assurance regulations were issued in 1988, as well as subsequent staff experience, and identified several specific risks that could cause shortfalls in decommissioning funding. These included underestimation of decommissioning costs caused by a restricted release assumption; operational events that caused increased costs; unavailability of funds due to bankruptcy; inadequate financial disclosure; corporate reorganizations that make funds difficult to reach; and investment losses of funds set aside for decommissioning. Several of the staff recommendations to address these issues are reflected in the final rule amendments.

On the bankruptcy issue, NRC staff reviewed a variety of sources to determine whether recent changes to the Bankruptcy Code, financial accounting practices, trends in the business cycle, or other factors might be making the bankruptcy of firms with financial structures similar to NRC's licensees more likely, or were causing bankruptcies to occur more quickly after firms get into financial trouble. Such factors could reduce the effectiveness of the financial tests for parent company and self-guarantees (References 21 - 30). These sources included the record of a recent bankruptcy by an NRC legacy site materials licensee, data on business bankruptcy trends from 1980 to 2005, data on firm failure rates by net worth categories, studies of bankruptcy topics published in the financial literature, and reports of decisions in bankruptcy cases addressing such topics as the regulatory exception to the automatic stay provision of the Bankruptcy Code and the availability of decommissioning funds through the administrative costs provision of the Bankruptcy Code. Staff examined data for a sample of bankrupt firms to assess the degree to which a firm's possession of tangible versus intangible assets affected its potential for entering bankruptcy and/or how it fared in bankruptcy. Staff also obtained assessments of the effectiveness of recent Sarbanes-Oxley legislation in curbing accounting abuses that could threaten the solvency of firms. Several of the financial assurance requirements in this final rule are intended to strengthen the parent guarantee and self-guarantee against bankruptcy risks. They include the requirement that firms supplying a parent guarantee or a self guarantee must set up a standby trust at the inception of the guarantee, that firms seeking to use a parent guarantee or self-guarantee must obtain an independent public auditor's evaluation of the firm's off-balance sheet transactions and provide an opinion on whether those transactions could materially adversely affect the company's ability to pay for decommissioning costs, and that guarantors must demonstrate to the NRC that they pass the financial test within 90 days following the close of each fiscal year. A clause added to the guarantee instrument requires the guarantor to immediately notify the NRC of the occurrence of events signifying financial distress and allow the NRC, in cases of financial distress by the guarantor company, to declare the financial assurance guaranteed by the guarantor to be immediately due and payable to the standby trust. In addition, elimination of the escrow account and line of credit as acceptable financial assurance mechanisms was based on an assessment of their relative risk in bankruptcy.

On the issue of financial test criteria, staff reviewed the technical analysis performed by the EPA in support of the financial tests for parent guarantee and self guarantee that were also eventually adopted by the NRC (Reference 31), and discussed with EPA staff the EPA's subsequent experience with and evaluations of the financial tests. In addition, staff reviewed the analysis of potential self-guarantee tests for non-profit colleges, universities, hospitals, and business firms that do not issue bonds (Reference 32). This final rule requires bonds used in the parent company and self-guarantee financial tests to be uninsured, uncollateralized, and unencumbered. This requirement is based on the analysis in NUREG/CR-6514 and makes the bond rating in the parent company and self-guarantees compatible with the requirements for

non-profit colleges, universities, and hospitals. The staff's analysis also led to the amendment in the rule to require that the guarantor's tangible net worth be at least $21 million to pass one of the criteria for the financial tests in Appendices A, C, and D of Part 30, an increase based on inflation from the current requirement to have tangible net worth of at least $10 million.

On the issue of including intangible assets in the net worth calculation, NRC staff evaluated the information received from stakeholders during the January 2007 public meeting. Staff also reviewed recent Statements of Financial Accounting Standards issued by the Financial Accounting Standards Board, including Statement No. 141 on business combinations and the determination of the value of goodwill and other acquired assets, and Statement No. 142 on the measurement of internally developed intangible assets. Articles from the accounting literature discussing the process by which intangible assets are valued, and potential problems and ambiguities, were also reviewed. Staff also reviewed a small sample of quarterly reports (Form 10-Q) filed by NRC licensees with the Securities and Exchange Commission to determine whether goodwill was reported separately from other intangible assets. This analysis provides the basis for the amendment in the final rule that, for the financial test requirements, tangible net worth must be calculated to exclude the net book value of the nuclear facility and site and any intangible assets, and net worth must be calculated to exclude the net book value and goodwill of the nuclear facility and site.

Staff reviewed the bond rating components of the parent company and self guarantee financial tests, using studies of the default rates of corporate bond issuers published by Moody's Investors Service and Standard & Poor's. In particular, staff reviewed data on the default rates for different categories of bond ratings, the length of time that elapsed from the last rating until default for defaulting firms, and the rating path of defaulters (References 33 - 34). Staff also examined through a review of the corporate ratings criteria of the ratings firms how intangible assets affect ratings. The information obtained supports the amendment in the final rule to continue to rely on bond ratings as significant components of the parent company and self guarantee financial tests and to clarify the status of adjustments (+ or - as issued by Standard & Poor's, or 1, 2, or 3 as issued by Moody's) to the ratings.

The requirement of establishing a security interest in collateral for the amount guaranteed in the parent guarantee and self guarantee financial assurance mechanisms is evaluated under Alternative 3 in this Regulatory Analysis. Collateral is not included in the final rule, or in the analysis of Alternative 2 in this Regulatory Analysis. NRC staff assessed the cost and implementation information received from stakeholders during the January 2007 public meeting. Discussions with a small number of firm financial officers, bankers, and attorneys tended to support the arguments made by stakeholders that a collateral requirement would be difficult to administer and subject to risks that other creditors could gain access to the same collateral (Reference 35). Upon completion of the Regulatory Analysis for the proposed rule, NRC staff rejected the option to require a security interest of collateral for the guaranteed amounts.

Risk Assessments

NRC staff performed a broad range of technical analyses of issues affecting the financial tests for parent company and self guarantees; bond ratings, accounting standards pertaining to intangible assets, bankruptcy, business reorganizations, investment of funds, collateral, and insurance. The purpose of these analyses was to better risk inform the staff's recommendations on particular regulatory proposals.

In January 2006 the staff reviewed a study evaluating topics that could pose risks that funds would not be available when needed for decommissioning materials licensees (Reference 21) The issues included an evaluation of whether explicit NRC approval of decommissioning cost estimates submitted by licensees would be likely to increase the accuracy of such estimates. The study outlined the current practices of other federal agencies to review cost estimates, and assessed the potential benefits and drawbacks of cost estimate approvals. These topics were given additional attention by the staff during 2006 and 2007.

Regulations Before this Final Rule

The following two sections describe the regulatory framework prior to this final rule and how that framework is revised by the final rule. The final rule amendments are in two sections. Section 2.2.1 includes the amendments that require licensees to provide accurate information in decommissioning cost estimates. Section 2.2.2 includes the amendments that require licensees to provide adequate decommissioning financial assurance at the start of decommissioning activities.

2.2.1. Detailed Reporting

Since establishment of financial assurance requirements for decommissioning in 1988, the staff has reviewed approximately two hundred decommissioning cost estimates. In addition, staff recently reviewed decommissioning cost estimates prepared as part of license applications for two proposed uranium enrichment facilities. In the course of these reviews, NRC staff have identified certain issues that frequently arise in the preparation of decommissioning cost estimates, including failures to provide an adequate level of detail, missing or inadequate contingency factors, reliance on first-party rather than independent third-party costs as the basis of the estimate, and delays in revising the decommissioning cost estimates when the facility conditions change. NRC staff also identified situations in which licensees were not adequately familiar with guidance provided in NUREG-1757 (Reference 41) concerning the contents of decommissioning cost estimates and how such estimates should be organized to provide the most effective presentation of the decommissioning activities to be performed and their expected costs. The following amendments in the final rule have the objective of providing the NRC with an accurate decommissioning cost estimate (DCE). They are discussed individually below.

Changes to § 30.35(e), § 40.36(d), Crit 9(b) in App A of Part 40, § 70.25(e)(1), and § 72.30(b)

Before this final rule, the regulations required that each DFP must contain a cost estimate for decommissioning, including the means for adjusting the cost estimate periodically over the life of the facility. Although detailed guidance on the DCE is contained in NUREG 1757, Volume 3, licensees are not required to follow the guidance. The final rule specifies that the DCE must be “detailed,” that it be based on the cost of an independent contractor to perform all decommissioning activities, that it specify the volume of soils and ground water containing residual radioactivity that will require remediation to meet the criteria for license termination, that it contain an “adequate” contingency factor, and that it identify and justify the key assumptions contained in the DCE. In addition, the final rule specifies that a DCE for licensees under Parts 30, 40 (except for licensees subject to Appendix A to Part 40), 70, and 72 must be based on the cost of meeting the § 20.1402 criteria for unrestricted use, unless the licensee can demonstrate its ability to meet the provisions of § 20.1403 (restricted release).

Changes to § 50.82(a)(4)(i) and (a)(8)(v), (vi) and (vii)

Before the final rule, the regulations required that a power reactor licensee submit a post-shutdown decommissioning activities report (PSDAR) that includes a description of the planned decommissioning activities, along with a schedule for their accomplishment, and an estimate of expected costs. The contents of the cost estimate were not specified, nor do the requirements for the cost estimate refer to the costs of managing irradiated fuel, which can be considerable and which can be incurred for a considerable time (including a period after other decommissioning activities have been completed). The final rule amendment to 10 CFR 50.82(a)(4)(i) make clear that the cost estimate in the PSDAR must include estimates for decommissioning the facility and for managing irradiated fuel. The amendments to 10 CFR 50.82(a)(8)(v), (vi) and (vii) require annual reporting in a financial assurance status report of current amounts spent and estimated to be spent to complete decommissioning, balance of funds available for decommissioning, funds accumulated for managing irradiated fuel, and the projected cost to manage irradiated fuel until title is transferred to the Secretary of Energy.

2.2.2. Tighter Controls

The following amendments have the common objective to provide greater certainty to the NRC that adequate financial assurance will be available at the start of decommissioning activities. They are discussed individually below.

Changes to § 30.35(c)(6), § 40.36(c)(5), and § 70.25(c)(5)

Before the final rule, the regulations allowed licensees authorized to possess relatively small quantities of radioactive materials meeting limits specified in 10 CFR 30.35(d) to submit a certification that they have financial assurance, rather than having to prepare a detailed DCE. Licensees authorized to possess radioactive materials in higher amounts must submit a DFP, which includes a site-specific DCE. The amendments require licensees, including those that would otherwise qualify to use the certification, to submit a DCE if survey results detect significant residual radioactivity in soils or ground water (i.e., detected levels that would, if left uncorrected, prevent the site from meeting the criteria for unrestricted use). Remediating subsurface contamination can be very expensive. However, licensees that have licensed possession limits below the amounts that trigger the DFP requirement had no requirement before this final rule to increase the amount of financial assurance to cover subsurface remediation costs. This final rule provides the regulatory basis to require such licensees to cover the full cost of decommissioning, not just the prescribed amount covered by a certification.

Changes to §§ 30.35(f), 40.36(e), 70.25(f), and 72.30(e)

Before this final rule, the regulations allowed the use of an escrow account as a financial assurance mechanism. An escrow account may be less preferable than a trust for assurance that funds will be available when needed for decommissioning. The EPA concluded that a trust was more protective of funds because, under trust law, the title to property in a trust is transferred to the trustee, while in an escrow account, title to the property remains with the grantor (46 FR 2802, 2827). Thus, property in an escrow is more likely to be subject to a creditor's claim than property held in trust. In addition, the law of trusts places obligations on the trustee to act in the interest of the beneficiary. In contrast, an escrow agent is responsible only for what is specified in the escrow agreement. The EPA concluded that it would be

extremely difficult to draft an escrow agreement that adequately specifies all the actions that an escrow agent would need to take in all situations to assure the instrument served its intended purpose. Therefore, the final rule eliminates the escrow as a method to provide financial assurance. About 25 licensees with escrow accounts are affected by this change.

Before this final rule, the regulations allowed lines of credit to be used as financial assurance mechanisms, but no licensee to date used this method to provide financial assurance for decommissioning. Maintaining the option to use a line of credit incurs costs to maintain regulatory guidance and conduct training. Although the cost is small, it appears no benefit is realized from retaining this option in the regulations. Therefore, the NRC has eliminated this option in this final rule.

Changes to § 30.35(i), § 40.36(h), § 70.25(i), and § 72.30(g)

Before this final rule, the regulations allowed funds set aside for decommissioning to be placed in accounts that are subject to market fluctuations with no requirement of licensees to monitor the fund balance and replace in a timely manner shortfalls that occur when market prices decline. This final rule requires the licensee to monitor the fund balance and specifies the time period for a licensee to make up a shortfall in decommissioning funding. A decline of 25 percent was selected as the make up trigger point because the cost estimate includes a 25 percent contingency. Licensees under Parts 30, 40 and 70 must perform monitoring of funds at least on a calendar quarter basis. To apply consistent timing between Part 72 general and specific licensees, the requirement under 72.30(g) is monitoring of the fund balance at least every calendar year since the Part 72 general licensees must perform an adjustment of funds at least annually under 10 CFR 50.75(b)(2). Requiring timely replacement of market losses will increase the likelihood that funds will be available for decommissioning when needed. This amendment was made as one of many separate assurances that funds will be available for decommissioning.

Change to § 20.1403(c) and § 20.1404(a)(5)

Before this final rule, the regulations allowed licensees to use several financial assurance mechanisms to provide decommissioning financial assurance for restricted site release, but specified no financial assurance options for licensees planning to decommission under 10 CFR 20.1404 alternate release criteria. A trust fund as a financial assurance mechanism is better suited to the long-term nature of the financial requirement because it can exist for long periods of time without need for renewal. The trust exists independently of the former licensee, and can continue to serve the purposes of control and maintenance even if the former licensee ceases to exist. The trustee has a fiduciary duty to serve the beneficiaries of the trust. The funds placed in the trust become property of the trust, and generally cannot be reached by creditors of the former licensee. The final rule amendments require licensees to place adequate funds into a trust for the purpose of long-term control and maintenance, and require sureties, insurance, other guarantee methods, and other forms of prepayment for restricted site release cases. Government entities continue to be permitted to use a statement of intent or to assume custody and ownership of a site. The final rule requires a trust be used as the decommissioning financial assurance mechanism in cases involving 10 CFR 20.1404 site releases. Very few licensees are expected to apply for site releases under the 20.1403 or 20.1404 criteria, and all such licensees are required to use a trust as the financial assurance mechanism. None of the current licensees are affected by this change. This amendment was made as one of many separate assurances that funds will be available for decommissioning.

Changes to § 30.34(b), § 40.46, § 70.36, and § 72.50(b)(3)

Before this final rule, the regulations did not specify required information of the transferee as part of the request for license transfer. The final rule codifies NRC regulatory guidance to require the existing licensee to provide information on the proposed transferee's technical and financial qualifications, and to provide financial assurance for decommissioning as a condition for approval of the transfer. The information and financial assurance are necessary to evaluate the adequacy of the proposed transferee. Placing these provisions in regulations, rather than continuing to rely on regulatory guidance, will improve regulatory efficiency by improving the quality of license transfer requests. This amendment was made as one of many separate assurances that funds will be available for decommissioning.

Changes to § 30.35(f), § 40.36(e), § 70.25(f), and § 72.30(e)

Before this final rule, the regulations specified only limited information that must be in the financial assurance instrument. Financial instruments submitted to the NRC do not always contain adequate identifying information regarding the licensee, the issuer, and, if applicable, the trustee. The final rule requires that the name and contact information for each party is included in the instrument, along with the license and docket numbers of the facility for which it provides financial assurance. Licensees are required to submit a revised instrument within 30 days of a change in the information on the current instrument. Many licensees will need to add information to their current instrument, but this information should be readily available and the cost to do so will be very small. This amendment was made as one of many separate assurances that funds will be available for decommissioning.

Changes to Parent Guarantee and Self Guarantee Methods [Appendices A, C, D, and E to 10 CFR Part 30]

Before this final rule, to be eligible to use a parent company or self guarantee financial assurance method, the regulations specified a minimum tangible net worth requirement of $10 million. This figure was first adopted by the EPA in 1981 and adopted by the NRC in 1998 (53 FR 24046), but had not since been changed to account for inflation. Therefore, to provide for inflation, the amended amount is $21 million. Research by staff indicates that none of the licensees who currently use the parent guarantee or self guarantee will fail to demonstrate minimum tangible net worth of $21 million.

Before this final rule, the regulations in Appendices A and C to 10 CFR Part 30 did not specify that the rated bond must be uninsured, uncollateralized, and unencumbered to adequately reflect a bond rating agency's evaluation of the financial stability of the bond issuer. The final rule will add the requirement that the bond rating used to pass the financial test must be uninsured, uncollateralized, and unencumbered. Research by staff indicates that none of the licensees who currently use the parent guarantee or self guarantee is expected to be affected by this change.

This final rule clarifies that qualifiers at the low end of the bond ratings, for example "-" and "3", meet the regulatory standard for bond rating. The final rule also requires an annual verification of the bond rating. None of the licensees who use the parent guarantee or self guarantee will be affected by this change.

Before this final rule, the regulations did not require the independent certified public accountant's special report to examine off-balance sheet transactions. Since these transactions have the potential to materially affect the guarantor's ability to fund decommissioning obligations, the final rule requires the auditor to include an opinion of off-balance sheet transactions. Information concerning these transactions should be readily available, particularly for publicly traded firms. For example, the American Institute of Certified Public Accountants has prepared materials for company audit committees and accountants on the identification and evaluation of off-balance sheet transactions. The NRC staff finds that this requirement is neither difficult nor unduly expensive to meet for the licensees who use the parent guarantee or self guarantee.

Before this final rule, the regulations required the licensee to repeat passage of the financial test each year, but did not explicitly state that the licensee must annually submit documentation to the NRC to verify its passage of the test. The final rule requires annual submittal of documentation that the guarantor passed the financial test. All of the licensees who use the parent guarantee or self guarantee will be affected by this change, but at a very low additional cost.

Before this final rule, the regulations did not require the guarantor to set up a standby trust to hold funds for decommissioning in the event the NRC requires the guarantor to provide such prepaid funding for decommissioning. The final rule requires the guarantor to set up a standby trust, and provides the Commission the right to change the trustee, and specifies that an acceptable trust is one that meets the regulatory requirements of the Commission. About 50 percent of the existing licensees who use the parent guarantee or self guarantee (or about 25 licensees) will be affected by this change.

Before this final rule, the regulations did not specify the guarantor's obligation to fund decommissioning work to terminate the license. The final rule clarifies that the guarantor's obligation is not capped at the guaranteed amount, but includes costs in excess of the guaranteed amount if additional funds are required to complete decommissioning and termination of the license. Staff has assumed that no licensees who currently use the parent guarantee or self guarantee will have to pay more for decommissioning than the guaranteed amount.

Before this final rule, the regulations did not require the parent company to comply with Commission orders. The final rule includes an agreement by the parent company making itself subject to NRC payment orders. The requirement is necessary because the parent company may not itself be an NRC licensee.

Before this final rule, the regulations did not provide for the possibility that the guarantor may be in financial distress at the time it is required to provide alternate financial assurance. In order to provide a money claim on the assets of the guarantor that would cover the cost of decommissioning at the time of a division of assets, the final rule authorizes the Commission to make the amount guaranteed immediately due and payable to the standby trust.

3. IDENTIFICATION OF ALTERNATIVE APPROACHES

The NRC considered three alternatives for the final rule:

Alternative 1: No-Action

This alternative provides a baseline to assess the other two alternatives (Reference 36). Under the No-Action alternative, the Commission would make no changes to current regulations. It assumes there will be one additional legacy site from currently operating facilities licensed by the NRC and four additional legacy sites from currently operating facilities licensed by Agreement States. The basis for this assumption is in Section 3.1 of this document.

Alternative 2: Decommissioning planning

This alternative would amend the regulations as described in Section 1.1 and 1.2 of this document to improve licensees' decommissioning planning. This is the preferred alternative.

Alternative 3: Decommissioning planning and collateral

This alternative would include all of the changes in Alternative 2, and it would add a requirement for a security interest in collateral to support the decommissioning assurance pledged in the parent guarantee and self guarantee financial assurance mechanisms.

3.1 Alternative 1: The No-Action Alternative

The No-Action alternative is to maintain the status quo. Under the No-Action alternative, the Commission would make no changes to the current regulations in 10 CFR Part 20 or to the regulations in 10 CFR Parts 30, 40, 50, 70, and 72 relating to decommissioning planning and decommissioning financial assurance. No costs would be incurred for the implementation of new regulations but society would incur costs due to additional legacy sites for the reasons discussed in Section 1.2. NRC staff reviewed the technical basis information in Section 2 and assessed the likelihood of additional legacy sites among different types of licensees. Five of the current 8 legacy sites are classified within program code 11700 in the NRC License Tracking System. This program code represents facilities licensed under 10 CFR Part 40 for rare earth extraction operations that are not subject to 10 CFR Part 40 Appendix A requirements.

NRC staff assumed under Alternative 1 that a single NRC licensed rare earth extraction facility will become a legacy site. Based on an approximate 4 to 1 relationship in the number of Agreement State licenses to NRC licenses, we assumed that four rare earth extraction facilities licensed by Agreement States will become legacy sites, for a total of five additional legacy sites.

The five additional legacy sites will require control and surveillance beginning in year 1 of the analysis. In year 15 of the analysis, the decommissioning for these sites is funded by Congressional appropriations (for a Federal agency) and State appropriations (for an Agreement State agency) and each site terminates its license that year consistent with unrestricted use criteria. The analysis for Alternative 1 also calculates collective dose from inhalation and ingestion of uranium contaminated soils at the legacy sites using methodology and assumptions in Appendix N of NUREG-1757, Volume 2 (Reference 37). The methodology would presumably be used by the licensee to determine whether remediation of the contaminated soils should be undertaken to meet the ALARA requirement of decommissioning.

Section 4.1.2 describes the specific assumptions and Appendix A shows the input and line item results for Alternative 1.

3.2 Alternative 2: Monitoring with Financial Assurance Changes

Alternative 2, the preferred approach, implements the regulatory amendments described in Section 1.1.

Section 4.1.3 describes the specific assumptions and Appendix B shows the input and line item results for Alternative 2. The analysis assumes that licensees implement the final rule amendments beginning in year 1. The amendments affect different numbers of licensees. For example, 40 licensees are assumed to be affected by the amendment to 10 CFR 30.35(f) to report on a one-time basis additional information in the financial assurance mechanism, whereas 0 licensees are assumed to be affected by 10 CFR 30.35(h)(3) to notify NRC of shortfalls in decommissioning funding and the plan to replenish the funds. These line item assumptions are made for licensees affected by the amendments in 10 CFR Parts 20, 30, 40, 50, 70, and 72, and shown in Appendix B.

Alternative 2 also assumes costs for licensees at the 5 sites that were modeled under Alternative 1 as legacy sites. These costs are to identify residual radioactivity in their subsurface environment, and implement appropriate leak detection, inspection and ground-water monitoring procedures to minimize the introduction of residual radioactivity into their site area. The assumption in Alternative 2 is that the licensees do this in year 1, and in year 2 these licensees have a choice of increasing financial assurance to remediate at a later time or remediate the subsurface residual radioactivity in year 2 to a level that would allow license termination under unrestricted use criteria. Because for uranium contamination it is a lower cost to remediate sooner rather than later, all 5 of the licensees are assumed to remediate in year 2. In the last year of the analysis, these licensees are still implementing the leak detection and monitoring program, and their sites are ready for license termination consistent with unrestricted use. There is no collective dose in Alternative 2.

3.3 Alternative 3: Monitoring with Financial Assurance Changes, and Collateral

Alternative 3 adds a collateral requirement to the assumptions of Alternative 2. The collateral requirement would establish a security interest equal to the amount of the guarantee for each licensee that uses a parent company guarantee or a self guarantee as a decommissioning financial assurance mechanism. The analysis assumes two-thirds of licensees with a Guarantee would apply collateral and the other one-third would switch to an alternate financial assurance mechanism. The analysis assumes 43 NRC licensees and 172 Agreement State licensees use Guarantees. These assumptions are consistent with information in the NRC License Tracking System and from information gathered from Agreement State via Information Request FSME-06-111, dated December 13, 2006. The total value of Guarantees represents a very large financial commitment for decommissioning, thus the collateral alternative is expensive.

Section 4.1.4 describes the specific assumptions and Appendix C shows the input and line item results for Alternative 3.

4. ANALYSIS OF VALUES AND IMPACTS

This section examines the values (benefits) and impacts (costs) expected to result from NRC's final rule. The benefits and costs are analyzed for implementation of the rule under Alternatives 1, 2, and 3.

The affected attributes for the rule are listed below with reference to their significance. Section 4.1 describes the methodology for calculating benefits and costs associated with each attribute. The analysis is done over a fifteen-year time period.

The results are presented in Section 5, in constant 2007 dollars. The results are presented for the one-time costs and the annual operating expense to implement the rule. The total cost of the rule over the 15-year implementation period is estimated using 7 percent and 3 percent real discount rates. Under the preferred approach, Alternative 2, the estimated total costs are $110 million and $77 million, discounted at 3 percent and 7 percent, respectively. Alternative 2 is about 40 percent lower cost than Alternative 1 and is substantially lower cost than Alternative 3.

The characteristics in the public and private sectors that will be affected by the rule are listed below. These are called "attributes," using the list of potential attributes provided by NRC in Chapter 5 of its Regulatory Analysis Technical Evaluation Handbook (Reference 38).

1. ***Public Health (Accident)***. NRC anticipates a slight benefit from ensuring that residual radioactivity is identified at operating facilities and that sufficient decommissioning funding is provided consistent with unrestricted use. No costs are anticipated for this attribute.

2. ***Occupational Health (Accident)***. NRC anticipates a slight benefit due to timely identification of residual radioactivity. No additional costs are anticipated for this attribute compared to current licensee practices.

3. ***Occupational Health (Routine)***. NRC anticipates a benefit due to timely identification of residual radioactivity. Costs are identified for this attribute but only for Alternative 1 where additional legacy sites are assumed and a cost of collective dose is estimated due to exposure to soil contamination over the 15-year analysis period.

4. ***Onsite Property***. A slight benefit is anticipated to onsite property due to a reduction in the incidence of ground-water contamination within the site boundary before decommissioning is completed. No costs are anticipated for this attribute.

5. ***Industry Implementation***. Industry would incur annual costs and one-time costs to implement the rule, and to become familiar with the rule requirements and guidance documents. Alternative 3 includes the implementation costs in Alternative 2, and the additional costs associated with the collateral requirement for the guarantees.

6. ***Industry Operation***. Industry would incur an increase in annual labor-related operating expense to implement the rule. Some licensees also will be required to pay annual fees for standby trusts that they are not currently incurring, and costs of financial assurance instruments including opportunity costs of collateral.

7. ***NRC Implementation***. NRC will incur one-time costs to implement the final rule following publication in the *Federal Register*. NRC will also need to revise guidance

documentation during this implementation time period, and will process financial assurance license applications and amendments during the initial period of implementation. NRC will incur one-time costs to review additional decommissioning cost estimates and financial assurance mechanisms.

8. ***NRC Operation***. NRC will incur an increase in annual operating expense due to staff time to review license amendments and applications, identify State requirements concerning renewal of financial statements and periodically re-filing financing statements; review amended decommissioning cost estimates, reviewing results of monitoring; and under Alternative 3 monitor security interests by conducting searches of State records to obtain information concerning collateral. NRC may achieve benefits from elimination of legacy sites and the associated necessity of monitoring such sites and engaging in enforcement activities and legal actions to obtain funds for decommissioning.

9. ***Other Government***. The rule will impose one-time and recurring costs to Agreement State governments of the same type as the costs incurred by NRC and proportionate to the number of materials licensees affected. These costs are estimated in the analysis.

10. ***Improvements in Knowledge***. Benefits are anticipated for NRC as a result of the rulemaking. NRC will gain valuable information about residual radioactivity at its licensed sites and about the adequacy of decommissioning financial assurance to terminate those licenses consistent with unrestricted release criteria.

11. ***Regulatory Efficiency***. The final rule will result in a small benefit due to elimination of existing regulatory authority to use the escrow account and the line of credit as approved financial assurance instruments, which will reduce the need for monitoring and potential enforcement and legal actions to obtain funds. A small benefit also will result from increased clarity and detail in decommissioning cost estimates, which will reduce the need for Requests for Additional Information and review by NRC staff, and result in greater accuracy in the decommissioning cost estimates.

12. ***Environmental Considerations***. NRC anticipates a slight benefit due to more timely and accurate identification of residual radioactivity that could result in contamination of soil and ground water. Reference 39, the Environmental Assessment for this final rule, contains more information. No costs are anticipated for this attribute.

13. ***Other Considerations***. Public confidence in NRC may be affected positively by the rule. The public may have more confidence in NRC's program for protection of human health and safety, and the environment, because decommissioning requirements have been improved and future legacy sites are more likely to be averted.

The following attributes are not expected to be affected:

1. ***General Public***. No impacts are anticipated for the general public.

2. ***Public Health (Routine)***. No impacts are anticipated for this attribute.

3. ***Offsite Property***. No impacts are anticipated for this attribute.

4. ***Safeguards and Security Considerations***. No impacts are anticipated.

4.1 Analytical Methodology

This section describes the process used to evaluate values and impacts associated with the affected attributes discussed above for the alternate methods to implement the final rule. The values (benefits) include any desirable changes in affected attributes. The impacts (costs) include any undesirable changes in affected attributes, such as increased costs for different segments of industry to conduct their business in accordance with new regulations. These attributes have quantifiable values and impacts due to implementing the rule:

– Occupational Health (Routine), for Alternative 1 where there are legacy sites
– Industry Implementation
– Industry Operation
– NRC Implementation
– NRC Operation
– Agreement State Implementation
– Agreement State Operation

NRC collected the input assumptions using data and information obtained from the following sources: Cost estimating manuals and other sources of data on costs of planning and implementing subsurface monitoring; information provided by State Secretary of State offices and other sources on costs and procedures for electronic filing of financing statements for collateral; NRC Workgroups and NRC Staff experience; Reports and documents (e.g., OMB burden statements); and independent research. An Agreement State representative participated in the NRC workgroup meetings. The number of affected entities for this rule was estimated using NRC information on existing licensees, NRC staff best professional judgment, and consultation with Agreement States.

4.1.1 General Assumptions

The general input assumptions for the analysis are discussed below.

- NRC wage rate: $110/hour. This is NRC's incremental labor rate, which includes only the variable costs associated with implementation and operation costs of the rule.

- Industry wage rate for licensee management and for legal support: $120/hour. This represents a blended rate for executive level and financial and administrative personnel and for both internal and external counsel.

- Industry wage rate for licensee clerical staff: $60/hour.

- Annual fees for financial assurance mechanisms (trust, surety bond, letter of credit): 5 percent of face value of mechanism

- Annual fees for standby trust (funded with de minimus amount): $800/year

- The time period for the analysis is 15 years. This is representative of the amount of time after a legacy site has recognized its inability to fully decommission its site and for State or Federal government to provide resources for site remediation and license termination

consistent with unrestricted use. This time period varies based on site-specific characteristics, but 15 years is a reasonable estimate for the legacy sites in this analysis.

- There are estimates of one-time implementation costs made in the first year of the analysis. There are estimates of recurring annual operating expense to support implementation of the rule. The values for annual operating expense are identical for each of the 15 years in the analysis. The annuity formula used to discount the annual expense values is on page B.3 of NUREG/BR-0184 (Reference 38).

4.1.2 Specific Assumptions for Alternative 1

Under the No-Action alternative (Alternative 1), NRC would make no changes to existing regulations. No financial costs would be incurred associated with regulatory amendments, but there would be 5 additional legacy sites – 1 NRC licensee and 4 Agreement State licensees. Detailed assumptions are in Appendix A. The specific assumptions for Alternative 1 are:

- The 5 legacy sites are assumed to be rare metal extraction facilities with uranium as a subsurface contaminant. The ore processing facility described in NUREG-0586 (Reference 40) was chosen as a representative site for this analysis. The facility pumps waste sludge to a settling pond about 100 meters from the facility. At this type of facility, residual radioactivity is primarily in the process and tailings areas and there is no significant contamination elsewhere. The main decommissioning task for these legacy sites involves the disposition of the residual radioactivity from the tailings pile and pond. The DECON decommissioning strategy was selected for this analysis. DECON requires the immediate removal and disposal of all residual radioactivity in excess of levels which would permit release of the facility for unrestricted use.

- Uranium as a contaminant penetrates into soil at a rate of about 1 inch per year, so the depth of subsurface contamination at the end of the analysis period is 15 inches. We are making this assumption to simplify the calculation in the analysis. There are other situations of submerged pipes, which usually start at a depth of about 5 feet below the surface, or the bottom of ponds that are deeper below the surface, which occur more frequently than uranium as a surface soil contaminant.

- The decommissioning cost for each legacy site is $55 million (2007$), which occurs in year 15 of the analysis. This decommissioning cost is based on the $32.69 million (1986$) DECON decommissioning cost estimate from NUREG-0586 (page 14-12) for this type of facility. The primary assumption was that 90 million pounds of radioactive sludge were transported 500 miles by truck to a low-level waste burial site. The sludge is removed from an area within the site boundary that is 200 square meters, 0.6 meters deep, with an average concentration of 200 pCi/gm due to uranium soil contamination.

- Each legacy site occupies 20 acres and there is a one time capital cost of $245,000 for surveillance and control of the site perimeter, with annual maintenance cost of $31,000.

- For each legacy site, the licensee identifies significant residual radioactivity in year 1 and shuts down operations because there is insufficient decommissioning financial assurance to terminate the license consistent with unrestricted use criteria. The licensee incurs in year 1 one-time implementation costs to install site surveillance and security for institutional control. The licensee also begins to incur the first of 15 annual costs for stabilization and control of

the site. With inadequate financial assurance for site decommissioning, government funding is used to decommission each site for unrestricted use. For the NRC site, the cost for decommissioning is an NRC operation cost. For the Agreement State sites, the cost for decommissioning is an Agreement State operation cost.

- For each legacy site, there is a potential for radiological exposure due to soil contamination. The averted dose methodology in NUREG-1757 Appendix N is applied to indicate the present worth (2007$) of the collective dose due to remediation of the soil. If the remediation is not performed it is considered a cost in Alternative 1. The critical group is workers at the site. With a relatively small contaminated area at low concentration levels, the Occupational Health (Routine) exposure is estimated to be about 0.6 person-rem over the 15 year analysis period.

4.1.3 Specific Assumptions for Alternative 2

Under Alternative 2, NRC amends 10 CFR 20.1406 and 20.1501 and makes changes to financial assurance requirements in 10 CFR Parts 30, 40, 50, 70, and 72 as described in Sections 1.1 and 1.2. There are no additional legacy sites in this alternative. Detailed assumptions are in Appendix B. The specific assumptions for Alternative 2 are:

- The same 5 facilities modeled in Alternative 1 as legacy sites are assumed in Alternative 2 to be operating facilities for the full 15-year period.

- The licensees of these 5 facilities identify significant residual radioactivity in year 1 and choose to remediate the contamination in year 2. The remediation is done to allow decommissioning and license termination in year 15 consistent with unrestricted use. This assumption is conservative in the calculation of benefits that would occur because it does not include estimates for other facilities (in addition to the 5 facilities) where, as a result of the rule, the occurrence of leaks is identified on an early basis and corrective actions are made to limit the spread of the source term, in particular before there is subsurface contamination.

- The remediation cost for each operating facility is $1.2 million (2007$), which occurs in year 2 of the analysis. This remediation cost is based on the $963,000 (1997$) cost estimate from NUREG-1496, Volume 3 (page C.2-45) for this type of facility with direct disposal of soil at a cost of $350 per-ft^3 (1997$). The 1997$ were escalated to 2007$ using indices of the Gross Domestic Product Implicit Price Deflator (118.041/95.054). For this type of facility to achieve a reduction in residual radioactivity dose rate of between 15 and 25 mrem/year, NUREG-1496 estimated approximately 75 cubic meter of soil volume would be removed.

- The decommissioning cost for each operating facility is $18 million (2007$), which is about one-third the cost to decommission a legacy site under Alternative 1. The assumption here is that uranium penetrates the soil at a rate of 1 inch per year for a total depth of only 1 inch in Alternative 2 and a total depth of about 15 inches in Alternative 1. For both Alternatives, the DECON decommissioning in year 15 is done using a bulldozer to remove contaminated soil. The sensitivity of bulldozer soil clearance depth is assumed to be in increments of 6 inches, so under Alternative 2 with uranium contamination only 1 inch deep only one pass of the bulldozer is required to remove the soil whereas three times that amount were removed under the Alternative 1 legacy site with 15 years of uranium seepage into the soil.

- The licensees of these facilities conduct surveys starting in year 1 using an appropriate monitoring program pursuant to the amendments to 10 CFR 20.1501 and 20.1406. For inspection and leak detection activities at each facility, the one-time and annual operating costs are $8,800 and $4,500 respectively. For ground-water monitoring activities at each facility, the one-time and annual operating costs are $46,000 and $5,000 respectively.

- The decommissioning planning and financial assurance amendments in this final rule will affect certain licensees based on the specific section of regulation. For example, we assume 10 licensees are affected annually by the change in 10 CFR 30.35(e)(2) to assess whether specific incidents, such as spills or leaks, will affect the decommissioning cost estimate, whereas no licensees are assumed to be affected annually by the change in 10 CFR 30.35(h)(3) to notify NRC of shortfalls in decommissioning funding and their plan to replenish the funds. These line item assumptions are made for each of the amendments in 10 CFR Parts 20, 30, 40, 50, 70, and 72 and are shown in Appendix B.

- Amendments in this rule reduce the number of approved financial assurance mechanisms and require certain licensees to use a Decommissioning Funding Plan instead of a certified amount for decommissioning financial assurance. Elimination of the escrow account affects the following number of NRC licensees: 14 in Part 30, 3 in Part 40, and 2 in Part 70. The change to require a licensee with significant subsurface residual radioactivity to shift from a certified amount to an approved Decommissioning Funding Plan is estimated to affect one licensee each year under Parts 30, 40, and 70. Another change requires licensees who use a parent guarantee or a self guarantee as a decommissioning financial assurance mechanism to establish a standby trust; this affects the following number of licensees: 30 in Part 30, 6 in Part 40, 6 in Part 70, and 1 in Part 72. The number of Agreement State licensees affected by the regulations is assumed to be four times the NRC licensees for Parts 30 and 40.

- A one-time implementation cost is assumed for 500 NRC licensees and 1,000 Agreement State licensees who have an obligation to maintain decommissioning financial assurance and who have liquid processes at their facility that could cause significant subsurface residual radioactivity at the site. An estimate is made of 90 minutes for each of the 1,500 licensees to read the final rule changes to 10 CFR Part 20 and the survey and monitoring guidance released with the final rule.

- The reporting requirements in 10 CFR 72.30(b), (c), and (d) apply to ISFSI general and specific licensees. An estimated 20 licensees per year assess the occurrence of four specific events at their site pursuant to new 10 CFR 72.30(c).

- Power reactor licensees with a reactor in decommissioning status will have increased reporting requirements under changes to 10 CFR 50.82 for an estimated 3 licensees per year.

- Fuel cycle facilities licensed under Part 70 will have increased reporting requirements under changes to 10 CFR 70.25 and 70.36.

- Licensees with a Part 72 specific license will have increased burden in their monitoring of decommissioning fund balance under changes to 10 CFR 72.30(g). Licensees with a Part 72 general or specific license will have increased reporting requirements under changes to 10 CFR 72.30(c).

4.1.4 Specific Assumptions for Alternative 3

All of the specific assumptions in Alternative 2 apply to Alternative 3. In addition, Alternative 3 would add a new requirement of licensees who use a parent guarantee or a self guarantee to provide a security interest in collateral in support of the guarantees. This would provide additional assurance that decommissioning funds will be available when needed. There would be no additional legacy sites in Alternative 3. Detailed assumptions are in Appendix C. The specific assumptions for Alternative 3 not mentioned previously are:

- The number of NRC and Agreement State licensees with a parent guarantee or a self guarantee, and the total guaranteed amount, is shown below:

	NRC licensees	NRC $ Amount	A/S Licensees	A/S $ Amount
Part 30 and 50	30	120 million	120	110 million
Part 40	6	220 million	24	90 million
Part 70	6	200 million	0	
Part 72	1	40 million	0	

- Of the licensees with Guarantees, two-thirds are assumed to use collateral as a security interest and one-third are assumed to choose a less-expensive alternative by switching to a different financial assurance mechanism. For those who use collateral, the average cost of collateral among the licensees is 2.5 percent of the guaranteed amount. For those who switch to a different mechanism, the average cost is 3 percent of the guaranteed amount.

- There are small one-time costs to establish standby trusts and to switch financial assurance mechanisms.

- The number of hours required for NRC and Agreement States to implement and maintain the more complex regulations requiring a security interest in collateral would be 20 percent higher than the effort to implement and maintain the regulations under Alternative 2.

5. RESULTS

This section presents results of values and impacts that are expected to be derived from the final rule. The results are shown for each affected Part in Title 10 of the Code of Federal Regulations and by the following seven attributes:

- Occupational Health (Routine) for Alternative 1 where there are legacy sites
- Industry Implementation
- Industry Operation
- NRC Implementation
- NRC Operation
- Other Government Implementation (Agreement States)
- Other Government Operation (Agreement States)

The rule is expected to provide values in other attributes, such as Improvements in Knowledge, Regulatory Efficiency, Environmental Considerations, and Public Confidence, but these values are not quantified because they are expected to be small and there is no verifiable input available at this time to support input assumptions. The costs are presented in constant 2007 dollars, for both implementation and annual operating expenses. The impact of the final rule over a 15 year analysis period is estimated using 3 percent and 7 percent real discount rates to show an overall effect in terms of 2007 dollars. Alternative 1, the No-Action Alternative, provides a baseline against which the other two alternatives are assessed.

5.1 Summary of Results

Table 5-1 presents the net impact of the rule for each of the three alternatives, at 3 percent and 7 percent real discount rates, including all benefits and costs over the 15-year analysis period. Because the rule is intended to avoid the occurrence of legacy sites, the net impact of Alternative 1, the No-Action Alternative, is estimated to include the existence of 5 legacy sites that would not occur under Alternatives 2 or 3.

Table 5-1: Net Impact of Alternatives 1, 2, and 3

Regulatory Alternative	15-year total at 3% discount rate ($ 000)	15-year total 7% discount rate ($ 000)
1. No Action	179,593	102,315
2. Monitoring and Financial Assurance	109,609	77,292
3. Monitoring, Financial Assurance plus Security Interest in Collateral for Parent and Self-Guarantees	369,938	276,827

The input and line item results for the No-Action Alternative 1 are shown in Appendix A. The major contributing costs under Alternative 1 are due to:

- The costs shown in Table 5-1 are for a total of 5 legacy sites over a 15 year period.
- The total one-time cost for each of the Part 40 licensees with a legacy site is $245,000.
- The annual operating cost for surveillance and site stabilization and control at each legacy site is $31,000 which is equal to $370,000 present value 2007$ over the 15 year analysis period at 3 percent discount rate.
- The decommissioning cost for each legacy site in year 15 is about $35 million (2007$) at 3 percent discount rate. The decommissioned area is about 200 square meters by a depth of about 0.6 meter. The depth is about 18 inches equal to 3 passes of a bulldozer. About 90 million pounds of radioactive sludge is disposed in the DECON decommissioning of each site. The decommissioning cost is paid by State or Federal government.
- The collective dose over the 15 year analysis period is about 1 person-rem for each site for a total of 5 person-rem. The cost associated with collective dose for all 5 sites over the 15 year period is about $6,000 (2007$) at 3 percent discount rate.

The input and line item results for Alternative 2 are shown in Appendix B. The major contributing costs under Alternative 2 are due to:

- The same 5 sites modeled under Alternative 1 operate over the 15 year analysis period and implement leak detection and ground-water monitoring, starting in year 1. The total cost per facility over the 15 year period is about $54,000 and $60,000 for leak detection and ground-water monitoring, respectively.
- The remediation cost for each facility in year 2 is about $1.2 million (2007$). The remediation area (i.e., 200 square meters) was conservatively estimated as the same depth (i.e., 18 inches) as the decommissioned area for Alternative 1. The total amount of remediated soil is 75 cubic-meters.
- The decommissioning cost for each facility in year 15 is about $12 million (2007$) at 3 percent discount rate. This decommissioning cost is paid by the licensee. The decommissioned area is about 200 square meters at a depth of about 6 inches. A total amount of about 30 million pounds of radioactive sludge is disposed in DECON decommissioning.
- The implementation of the final rules by industry, NRC and the Agreement States represent a total of about $44 million (2007$) over the 15 year period, at 3 percent discount rate. NRC licensee costs are about $6 million, and NRC costs are about $3 million. Agreement State licensee costs are about $23 million, and Agreement State costs are about $12 million. The implementation of the rules by industry represents about 26 percent of the total for Alternative 2. Virtually all of the industry costs are due to amendments in 10 CFR Parts 20 and 30.

The input and line item results for Alternative 3 are shown in Appendix C. The major contributing costs under Alternative 3 are due to:

- Using the 3 percent discount rate, the extra $257 million for Alternative 3 compared to Alternative 2 is due to implementing the requirement of collateral as a security interest for Guarantees. With an estimated $840 million in Guarantees for both NRC and Agreement States licensees, and among the approximate 200 licensees who use Guarantees, about $170 million is due to the cost of collateral and $90 million is due to licensees using an

alternative financial assurance mechanism. Alternative 3 is not considered a viable alternative compared to Alternative 2.

Table 5-2 provides the estimated costs, by attribute, over the 15-year analysis period. The Industry Operation costs represent about 80 percent of total costs under Alternative 2, and are mostly due to decommissioning and remediation costs which are $59 million and $6 million respectively (see Table B-1). At the 3 percent discount rate for Alternative 2, about $94 million of the total $109 million is for implementation of the rule by industry, due to one-time implementation and multi-year operating costs, and $15 million of the total is for implementation of the rule by NRC and Agreement States. Note the total values match Table 5-1.

Table 5-2: Estimated Values and Impacts by Attribute

Attribute	Alternative 2 15-Year Total Cost ($ 000)		Alternative 3 15-Year Total Cost ($ 000)	
	3% Discount	7% Discount	3% Discount	7% Discount
Industry Implementation	7,254	7,254	8,089	8,089
Industry Operation	87,115	54,799	343,561	250,451
NRC Implementation	144	144	172	172
NRC Operation	2,978	2,978	3,574	3,574
Other Government Implementation	204	204	245	245
Other Government Operation	11,913	11,913	14,296	14,296
Total	109,609	77,292	369,938	276,827

Implementation costs shown above represent one-time costs that would be incurred by affected licensees, NRC and Agreement States to implement changes to regulations in Alternatives 2 and 3.

Operation costs shown above represent the additional annual operating expense projected to be incurred by affected licensee, NRC and Agreement States over 15 years to meet the requirements in the rule.

Table 5-3 presents estimated values and impacts, by affected 10 CFR Part, for the Industry Implementation and Industry Operation costs shown in Table 5-2.

Table 5-3: Estimated Costs by 10 CFR Part for Industry Implementation and Operation

	Alternative 2				Alternative 3		
	One-time ($ 000)	Annual 3% ($ 000)	Annual 7% ($ 000)		One-time ($ 000)	Annual 3% ($ 000)	Annual 7% ($ 000)
Part 20 NRC – final rule	97.2	2,200.4	1,678.8		-	-	-
Part 20 A/S—final rule	208.8	8,801.6	6,715.1		-	-	-
Part 20 total	306.0	11,002.0	8,393.9		306.0	11,002.0	8,393.9
Part 30 NRC – prop rule	134.7	3,064.0	2,337.6		-	-	-
Part 30 NRC – collateral	0	0	0		134.0	16,076.4	12,265.3
Part 30 NRC total	134.7	3,064.0	2,337.6		268.7	19,140.4	14,603.0
Part 30 A/S total	539.0	12,256.0	9,350.5		1,075.0	76,561.6	58,411.8
Part 30 total	673.7	15,320.0	11,688.2		1,343.7	95,702.0	73,014.8
Part 40 NRC – decom	0	11,767.5	6,644.8		-	-	-
Part 40 NRC – remedtn	1,165.0	0	0		-	-	-
Part 40 NRC – coll dose	0	0	0		-	-	-
Part 40 NRC – GWM	54.8	113.4	86.5		-	-	-
Part 40 NRC – final rule	30.6	168.8	128.8		-	-	-
Part 40 NRC – collateral	0	0	0		26.8	20,023.9	15,277.0
Part 40 NRC total	1,250.5	12,049.7	6,860.2		1,277.3	32,073.6	22,137.2
Part 40 A/S total	5,002.0	48,198.7	27,440.6		5,109.2	128,294.3	88,548.7
Part 40 total	6,252.4	60,248.4	34,300.8		6,386.4	160,367.9	110,685.8
Part 50 NRC – final rule	0	143.3	109.3		0	143.3	109.3
Part 70 NRC – final rule	21.8	163.1	124.4		-	-	-
Part 70 NRC – collateral	0	0	0		26.8	63,958.7	48,796.6
Part 70 NRC total	21.8	163.1	124.4		48.6	64,121.8	48,921.0
Part 72 NRC – final rule	0	238.8	182.2		-	-	-
Part 72 NRC – collateral	0	0	0		4.5	11,985.7	9,144.3
Part 72 NRC total	0	238.8	182.2		4.5	12,224.4	9,326.5
Total NRC and A/S	7,253.9	87,115.4	54,798.7		8,089.2	343,561.4	250,451.2

Note: the " - " symbol in the table above indicates the same value as in Alternative 2.

The values in Table 5-3 represent estimates of NRC and Agreement State licensee costs for activities related decommissioning (decom), remediation (remedtn), collective dose (coll dose) leak detection and ground-water monitoring (GWM), implementation of the final rule (final rule), and the collateral requirements analyzed in Alternative 3. Note the total NRC and A/S values match Industry Implementation and Industry Operation values in Table 5-2.

6. PRE-RULE ANALYSIS VALUES AND IMPACTS

This section addresses the values and impacts of the Industry Ground Water Protection Initiative (GPI). The voluntary GPI "identifies actions to improve utilities' management and response to instances where the inadvertent release of radioactive substances may result in low but detectible levels of plant-related materials in subsurface soils and water" (Reference 14; August 31, 2007). The GPI applies to operating power reactors licensed under 10 CFR Part 50. This section identifies the manner in which the voluntary GPI will provide an effective and efficient resolution of subsurface radioactivity detection and monitoring issues at power reactors. It also identifies NRC inspection criteria to inspect compliance by industry to assure performance of the commitments made in the voluntary GPI.

Voluntary Initiative by Licensees of Power Reactors

The purpose of the GPI, as described in the Reference 14 document dated August 2007, is to "help licensees to: (1) improve management of situations involving inadvertent radiological releases that get into ground water and (2) improve communication with external stakeholders to enhance trust and confidence on the part of local communities, States, the NRC, and the public in the nuclear industry's commitment to a high standard of public radiation safety and protection of the environment." The GPI only applies to licensed radioactive materials that are or were generated as a result of plant operations.

The GPI identifies licensee actions to implement a ground water protection program. Each of the actions has objectives and acceptance criteria to demonstrate that the objectives have been met. The GPI is a written document maintained by the power reactor licensee, specifying the frequency at which and/or conditions under which each program element is to be performed to ensure that the licensee's understanding of the site, the potential for leaks or spills to occur, or for equipment to degrade over time accurately reflect actual conditions at the site. The three program areas and action for each program area are:

- Ground Water Protection Program, with an action to "improve management of situations involving inadvertent radiological releases that get into ground water."

- Communication, with an action to "improve communication with external stakeholders to enhance trust and confidence on the part of local communities, States, the NRC, and the public in the nuclear industry's commitment to a high standard of public radiation safety and protection of the environment."

- Program Oversight, with an action to "perform program oversight to ensure effective implementation of the GPI program."

Reference 14 documents licensee commitments in the GPI. The commitments have not been controversial among industry or among the public. The commitments are expected to be performed in a manner similar to other routine operating procedures performed to support power reactor operations and are expected to continue throughout the term of the reactor operating license.

NRC Inspection Criteria

The NRC will begin to inspect in 2008, the activities performed by power reactor licensees compared to their public commitments in the GPI. NRC Temporary Instruction 2515/173 (ADAMS ML072950622) will be used by inspectors to assess if licensees have completed the voluntary industry Groundwater Protection Initiative. The Temporary Instruction includes inspection of licensees' Annual Reporting whereby the power reactor licensees will have documented onsite groundwater sample results for each calendar year in the Annual Radiological Environmental Operating Report (AREOR) or the Annual Radiological Effluent Release Report (ARERR), as part of their annual Environmental Reports. This information is publicly available in ADAMS.

NRC staff has concluded that the monitoring and survey processes and related reports prepared at power reactor sites, or budgeted for implementation before the effective date of a final rule for Decommissioning Planning, likely would contain sufficient information to satisfy the new 10 CFR 20.1406(c) and revised 20.1501 requirements. NRC is not requiring licensees to submit reports but the information must be available for review. It is not expected that power reactor licensees will need to install new capital or modify operating procedures to satisfy the new 10 CFR 20.1406(c) and revised 20.1501 requirements. Assuming the NRC publishes a Decommissioning Planning final rule in its present form, it may be necessary for licensees at a time after the effective date of the final rule to install additional monitoring equipment under some circumstances. This could occur, for example, if significant residual radioactivity in the subsurface is detected at a site (i.e., it is determined to be a quantity that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402). The need for additional monitoring equipment would be determined on a case-by-case basis by either licensee activities or after NRC inspection activities. NRC's schedule is to publish a final rule no earlier than November 2008.

The conclusion above that reactor licensees and applicants will likely have sufficient information to satisfy the new 10 CFR 20.1406(c) and revised 20.1501 requirements is supported by the following conditions:

- Power reactor licensees have already invested or have budgeted funds for the fixed costs to achieve the GPI actions and objectives;
- The GPI has been undertaken by licensees to increase public confidence and is unlikely to be eliminated in the future because of the detrimental impact on public confidence that would cause; and
- The GPI is well-defined and will have been in place for several months after the effective date of a final rule.

6.1 Pre-Rule Results

NRC is not aware of cost data representing the GPI actions and objectives at nuclear power reactors.

Appendix D provides the assumptions for estimates of the one-time and recurring annual operating cost to support leak detection, ground water monitoring and communications undertaken by power reactor licensees in the voluntary GPI. A conservative assumption is used that each power plant site, after consideration of hydrology and geology studies, installs 10 ground water monitoring wells. The assumed one-time capital cost is $900,000 for each nuclear power plant site. Assuming 65 sites represent the 104 operating power reactors, the total for one-time capital costs is $58.5 million. The annual operating cost to implement the GPI is estimated at $60,000 (2007$) per nuclear power plant site. Assuming 65 sites, the total for all power reactor sites is approximately $3.9 million annually (2007$). Over a 15 year period, this annual recurring cost for 65 sites is equal to $46.6 million and $35.5 million at 3 percent and 7 percent discount rates, respectively.

The total GPI cost over a 15 year period, including both one-time and annual operating costs, for the operating power reactors is equal to $105 million and $94 million, at 3 percent and 7 percent discount rates, respectively. This total cost represents the expenditures that would be associated with implementation of the GPI, under the conservative assumption that ground water monitoring wells are needed at each site and in the absence of any existing ground water monitoring, analysis, and reporting capability by power reactor licensees. However, existing regulatory requirements in 10 CFR § 50.34a [Design objectives for equipment to control releases of radioactive material in effluents–nuclear power reactors], and § 50.36a [Technical specifications on effluents from nuclear power reactors], and 10 CFR Part 50, Appendix I [Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion “As Low As Is Reasonably Achievable” for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents] as well as the existing requirements in 10 CFR § 20.1501 have caused power reactor licensees to implement Radiological Environmental Monitoring Programs (REMP). The REMP at power reactor sites are now being supplemented when necessary with actions associated with the GPI. The Action Plan guidance document for the GPI specifies that companies will not necessarily be required to drill more monitoring wells, modify plant systems, structures, or components, and that the scope of any needed enhancements will vary from site to site, depending on the extent and quality of current programs for detecting and preventing leaks and the efficacy of the current site program for monitoring ground water.

This analysis assumes that the costs incurred by power reactor licensees to implement the GPI are equivalent to the estimate provided in Appendix D and that no additional costs will be incurred beyond those already expended under the GPI to implement the final rule requirements, as of the effective date of the final rule.

The results shown in Section 5 provide no credit for the GPI because the activities by licensees were undertaken before development of the rule. The estimate shown in Appendix D is the cost that would be included if the licensees were given full credit for the voluntary GPI.

7. BACKFIT ANALYSIS

The NRC has determined that the NRC's backfitting rules at issue here (10 CFR 50.109, 70.76, and 72.62) do not require the preparation of a backfit analysis for this rulemaking. A backfit is the modification of equipment or procedures required to operate a facility resulting from new or amended NRC regulations, or the imposition of a regulatory staff position interpreting the Commission rules that is either new or different from a previously applicable staff position.

The new or amended regulations in this final rule either clarify existing requirements, or require the collection and reporting of information using existing equipment and procedures, or are administrative matters outside the scope of the backfitting rules. The amended survey and monitoring requirements in Part 20 of this rulemaking do not constitute a backfit because they are information collection requirements to support licensee and NRC decisions on decommissioning planning and related activities. The decommissioning financial assurance requirements being amended in Parts 30, 40, 50, 70, and 72 of this rulemaking do not entail modifying any equipment or procedures required to operate the types of NRC-licensed facilities covered by the backfitting rules. These regulatory changes concern administrative matters and are not backfits. Therefore, as discussed further below, the NRC finds that preparation of a backfit analysis is not required for this rulemaking.

In part, this rulemaking amends 10 CFR 20.1406 and 20.1501. Section 20.1406, "Minimization of contamination," is amended by adding a new subsection (c) to read as follows:

> (c) Licensees shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the existing radiation protection requirements in Subpart B and radiological criteria for license termination in Subpart E of this part.

This is not a backfit because it clarifies licensee requirements under existing regulations applicable to licensed operations. The current § 20.1101(a) requires each licensee to implement a radiation protection program to ensure compliance with the regulations in 10 CFR Part 20. The current § 20.1101(b) requires each licensee to use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA, during operations and during decommissioning. These operating procedures and controls need to include methods to minimize the introduction of residual radioactivity into the site, including the subsurface, during active facility operations to achieve doses that are ALARA. Otherwise, licensees will lack a substantive basis to demonstrate that they have achieved, during the life cycle of the facility (which includes decommissioning), public and occupational exposures that are ALARA. The concept of reducing residual radioactivity to ALARA levels as part of the decommissioning criteria has been a position of the NRC since at least 1994 (NUREG-1501, page iii). Licensees should already have these procedures in place as part of their radiation protection program, and 10 CFR 20.1406(c) clarifies this requirement.

Further, the revision to 10 CFR 20.1406 is a clarification of the policy articulated by the Commission in 1997, when the LTR was established. In the SOC accompanying the LTR, in response to a public comment that the requirements of then-proposed 10 CFR 20.1406 should apply to all licensees, rather than only to applicants for new licenses, the Commission stated:

"Applicants and existing licensees, including those making license renewals, are already required by 10 CFR part 20 to have radiation protection programs aimed towards reducing exposure and minimizing waste. In particular, Sec. 20.1101(a) requires development and implementation of a radiation protection plan commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of 10 CFR part 20. Section 20.1101(b) requires licensees to use, to the extent practicable, procedures and engineered controls to achieve public doses that are ALARA. In addition, lessons learned and documented in reports such as NUREG-1444 have focused attention on the need to minimize and control waste generation during operations as part of development of the required radiation protection plans. Furthermore, the financial assurance requirements issued in the January 27, 1988 (53 FR 24018), rule on planning for decommissioning require licensees to provide adequate funding for decommissioning. These funding requirements create great incentive to minimize contamination and the amount of funds set aside and expended on cleanup." (62 FR 39082).

As stated above, this rulemaking also amends 10 CFR 20.1501, "General" (part of Subpart F, "Surveys and Monitoring"). Section 20.1501 is amended by revising subsection (a), and inserting a new subsection (b), to read as follows:

(a) Each licensee shall make or cause to be made, surveys of areas, including the subsurface, that--
(1) May be necessary for the licensee to comply with the regulations in this part; and
(2) Are reasonable under the circumstances to evaluate --
(i) The magnitude and extent of radiation levels; and
(ii) Concentrations or quantities of residual radioactivity; and
(iii) The potential radiological hazards of the radiation levels and residual radioactivity detected.
(b) Records from surveys describing the location and amount of subsurface residual radioactivity identified at the site must be kept with records important for decommissioning.

The amended 10 CFR 20.1501(a) replaces the undefined term "radioactive material" with "residual radioactivity," a term already defined in 10 CFR Part 20. As defined in existing 10 CFR 20.1003, residual radioactivity includes subsurface contamination within its scope, and the word "subsurface" is being added to 10 CFR 20.1501(a). The current 10 CFR 20.1501(a)(2)(iii) already requires the evaluation of potential radiological hazards. Thus, as amended, 10 CFR 20.1501(a) makes clear that subsurface residual radioactivity is a potential radiological hazard that is within the scope of these survey requirements. This clarification of existing requirements does not represent a new NRC position and therefore does not fall within the definition of backfitting as set forth in the applicable backfitting regulations.

As set forth above, a new subsection (b) to 10 CFR 20.1501 requires that survey records describing the location and amount of subsurface residual radioactivity identified at a licensed site be kept with records important for decommissioning. NRC licensees are already required to keep records important for decommissioning. See, e.g., 10 CFR 50.75(g), 70.25(g), and 72.30(d). Moreover, the new 10 CFR 20.1501(b) is not intended to require recordkeeping of any and all amounts of subsurface residual radioactivity, but only amounts that are significant to achieve effective decommissioning planning and ALARA dose requirements. Regulatory changes imposing information collection and reporting requirements do not constitute regulatory

actions to which the backfit rule applies. New subsection 20.1501(b) and amended section 20.1501(a) contain provisions which require the licensee to perform surveys to collect data on the location and amount of subsurface residual radioactivity that may be a radiological hazard and important for decommissioning planning. Neither of these provisions constitutes a backfit because they are information collection requirements to support licensee and NRC decisions on decommissioning activities. The costs of these information and reporting requirements have been assessed in this Regulatory Analysis, and also are evaluated in the supporting statement submitted to the Office of Management and Budget for approval prior to promulgation of the final rule.

Further, the Commission established a broad framework when § 20.1501 was added to the regulations in 1991, when 10 CFR Part 20 was substantially revised (56 FR 23360). In the Statements of Consideration for that final rule, in a response to a comment about the lack of specificity in monitoring requirements, the Commission stated as follows:

> "Many portions of Part 20 are not very specific and detailed because Part 20 contains the NRC's general radiation protection requirements and applies to all classes of licensees, including large power reactors, universities, and medical institutions as well as small radionuclide and sealed source users. Because of this breadth of application, the requirements in Part 20 cannot be very detailed and for any one type of facility. However, the requirements in Part 20 are designed to provide the framework for all licensees and to establish provisions that the NRC considers to be fundamental to basic radiation protection [56 FR 23376]."

Within that broad framework, licensee requirements have included the need to provide basic radiation protection in the form of surveys during facility operations if there is reason to believe (e.g., based on records of past spills) that there is contamination or a radiological hazard at the licensed facility and site. These surveys have been done primarily to comply with occupational and public dose limits resulting from effluent releases. Such releases are subject to the requirements stated in 10 CFR 20.1301, 20.1302, and 50.36a, and the reporting requirements in § 40.65, § 50.36a(2), and § 70.59. The amended § 20.1501(a) requires that surveys also be performed if there is a reason to believe that subsurface contamination is present which constitutes a potential radiological hazard. Subsurface contamination, which is not obvious or evident, also is a risk for creation of a legacy site if contaminant characteristics are not addressed early when the facility is operating.

Additionally, adherence to the § 20.1501(a) survey requirements may be a necessary part of effectively planning for decommissioning, as well as to comply with dose limits resulting from effluent release. In this regard, the costs of drilling wells that may be necessary for purposes of collecting information for decommissioning planning purposes is not a backfit, because it does not involve the addition of any new structures, systems or components needed to operate a facility. It is also important to distinguish between effluent release dose limits (10 CFR 20.1301 and 20.1302) and decommissioning criteria dose limits. While the two sets of dose limits share the pathways used to calculate doses to a person (i.e., exposure from radioactive material that may be in the air, water, food crops, meat, and fish), the exposure is based on a different location. The effluent limits apply to a person outside the facility's site boundary. But for the decommissioning criteria, the maximum dose is expected to be to a person occupying the area that was decommissioned, which may include areas that were formerly inside the facility's restricted area. Another contrast between the two sets of dose limits is that the person's dose is calculated differently in each case. For effluent releases, the

dose is calculated for the maximally exposed person. But the decommissioning dose is calculated for the average person of the critical group. Due to these differences, the effluent release dose is not directly comparable to the decommissioning dose. Compliance with the effluent release dose requirements does not necessarily mean that remediation will be unnecessary to achieve the decommissioning criteria. Thus, the dose limits in NRC regulations concerning effluent release to unrestricted areas (10 CFR Parts 20, 30, 40, 50, and 70) are not applicable in determining whether significant residual radioactivity exists at a site.

As indicated above, facilities subject to this rulemaking and to which the backfit rule applies (i.e., power reactors, independent spent fuel storage installations (ISFSIs), and fuel cycle facilities) currently have monitoring systems to collect effluent release data from designated areas. A licensee is prohibited by 10 CFR 20.1301 from releasing radioactive materials to an unrestricted area in concentrations that exceed the limits specified in 10 CFR Part 20 or that exceed limits otherwise authorized in an NRC license. Power reactors are subject to effluent release regulations in § 50.36a that require each reactor's technical specifications to cite the ALARA release levels of radioactive materials to unrestricted areas during normal operations in addition to requiring compliance with § 20.1301. Section 50.36a was added to the regulations in 1996, when the decommissioning regulations for nuclear power reactors were revised (61 FR 39299). The numerical guidance in Appendix I to 10 CFR Part 50 was amended in the same final rule (61 FR 39303) to include reference to the § 50.36a technical specification effluent release ALARA requirements to be applicable during operations as well as during decommissioning activities. Fuel cycle facilities have reporting requirements of effluent release pursuant to §§ 40.65 and 70.59. Although not required, except in cases of a drinking water or irrigation source, these facilities also have designated onsite monitoring areas generally in the shallow ground water table. The NRC staff concludes that the monitoring systems at power reactors and fuel cycle facilities will produce sufficient information to meet the objectives of the amendments to 10 CFR 20.1501(a) and (b). The NRC staff similarly concludes that adherence to the existing monitoring requirements for direct radiation and effluents at ISFSIs, in accordance with § 10 CFR 72.126(c), produces sufficient information to meet the objectives of the amendments to 10 CFR 20.1501(a) and (b).

Accordingly, the NRC has determined that the final rule's provisions do not constitute backfitting and do not require the preparation of a backfit analysis. However, this regulatory analysis identifies the benefits and costs of the final rule, discusses the voluntary GPI, and evaluates other options for addressing the identified issues. As such, this regulatory analysis constitutes a "disciplined approach" for evaluating the merits of the final rule and is consistent with the intent of the backfit rule, and therefore constitutes a reasonable surrogate for achieving some of the objectives of the NRC's backfitting provisions in its regulations.

8. DECISION RATIONALE AND IMPLEMENTATION

The assessment of costs and benefits discussed previously provides a sound basis for decision-making that leads the NRC to the conclusion that the final rule, if implemented, would improve licensees' decommissioning planning and reduce the likelihood that a currently operating licensed facility will become a legacy site. The assessment provides a disclosure of information supporting the conclusion and alternate approaches to the regulatory objectives. Past experience has shown that a significant contributing factor of a site becoming a legacy site was the lack of knowledge by the licensee regarding the presence of significant onsite subsurface contamination while the facility was in an operating status. Together, the set of amendments in §§ 20.1406(c) and 20.1501, and the set of financial assurance amendments in 10 CFR Parts 20, 30, 40, 50, 70, and 72, will create greater confidence that the licensee has accurate information from which to base its decommissioning cost estimate, has reported additional details necessary for NRC staff review of the cost estimate, and that the financial assurance will be available when needed, even if the licensee enters bankruptcy.

Three alternatives were evaluated in this Regulatory Analysis:

- Alternative 1, the Baseline, would maintain the regulations as currently written;
- Alternative 2, the preferred Alternative, will amend operating requirements in §§ 20.1406 and 20.1501, and financial assurance requirements in 10 CFR Parts 30, 40, 50, 70, and 72, as discussed in Sections 1.1 and 1.2; and
- Alternative 3, which would provide a higher level of certainty, compared to Alternative 2, of obtaining licensees' decommissioning funds by requiring licensees who use the parent guarantee or self guarantee financial assurance options to provide a security interest in collateral for the amount guaranteed.

In the Baseline Alternative 1, where no regulatory action is taken, the NRC has assessed that an additional 1 legacy site would occur over the next 15 years under NRC jurisdiction, and an additional 4 legacy sites would occur in the Agreement States. These legacy sites were modeled as rare earth extraction facilities. The estimated cost associated with Alternative 1 is higher than the preferred Alternative 2.

Alternative 2 will increase survey and monitoring activities at some materials facilities, and will increase licensee decommissioning reporting and recordkeeping requirements under 10 CFR Parts 30, 40, 50, 70, and 72. Alternative 2 also will increase the amount of regulatory time and resources spent by NRC and Agreement States, compared to Alternative 1. The net benefits over a 15-year analysis period of Alternative 2 compared to Alternative 1, where the impact of an additional 5 legacy sites was modeled, was assessed to be about $70 million (2007$) at 3 percent discount rate (Section 5.1).

The net benefits of Alternative 2 provided "no credit" to 10 CFR Part 50 licensees for their estimated expenses over the 15-year analysis period to implement the voluntary Groundwater Protection Initiative (GPI). The GPI, its objectives, and its estimated costs are discussed in Section 6 of this document and in detail in Appendix D. No comments were received during the proposed rule public comment period regarding NRC's cost estimates of the GPI. The NRC estimated the costs of Part 50 licensees to implement the GPI over the 15-year analysis period to be about $105 million (2007$) at 3 percent discount rate. No credit was given for these activities because these costs are incurred regardless of the eventual promulgation of this final rule. The final rule does not codify any of the actions that power reactor licensees are

performing voluntarily under the GPI. New 10 CFR 20.1406(c) requires licensees to conduct their operations, to the extent practical, to minimize the introduction of residual radioactivity into the site, including the subsurface. The GPI does not specify licensee activities to minimize contamination at the site. Revised 10 CFR 20.1501(a) specifies that survey and monitoring requirements must be performed of residual radioactivity in areas, including the subsurface, that are potential radiological hazards. This final rule identifies significant residual radioactivity at the site as a potential radiological hazard. This specification of survey and monitoring requirements is not part of the GPI. In sum, the GPI has different objectives than the amendments in this final rule, and the voluntary activities by power reactor licensees were undertaken before development of this rulemaking.

If instead "full credit" was given for the expected costs under the GPI, the results for Alternative 2 would not change because no additional survey and monitoring activities were modeled in any of the Alternatives for power reactors who are implementing the voluntary GPI. Based upon the NRC's review of power reactor licensee reports and information known to the NRC about current conditions at power reactor sites, the NRC does not believe that any current power reactor licensee has contamination at its site which exceeds the threshold in the final rule that would require additional monitoring. Therefore, the Regulatory Analysis did not identify any additional costs or benefits associated with the final rule's survey and monitoring requirements as applied to current power reactor licensees. As noted in the Response to Comment G.5 in the final rule *Federal Register Notice*, power reactor licensees may modify or revise the scope of their existing survey and monitoring efforts based on demonstrated results of sample and survey data, or records of significant spills or leaks at the site, on a site specific basis. Following promulgation of this final rule, there may be an increase in survey and monitoring activities at some power reactors, and a decrease in activities at other power reactors. The Section 5 results for Alternative 2 in this Regulatory Analysis, although based on conditions at rare earth recovery sites, also apply to power reactors in that early detection of significant subsurface contamination through surveys and monitoring, and appropriate response by the licensee, is the preferred approach when the regulatory objective is to ensure the licensee and the NRC are aware of contamination that may create conditions that would complicate decommissioning, and possibly create a legacy site.

The costs modeled under Alternative 3, which would require licensees who use the parent guarantee or self guarantee financial assurance options to provide a security interest in collateral for the amount guaranteed, were much higher than the costs in Alternative 2. This increase in cost does not provide an equivalent increase in the certainty of obtaining decommissioning funds compared to Alternative 2.

For the reasons discussed in the previous paragraphs, Alternative 2 is superior to Alternative 1 and Alternative 3. Over the 15-year analysis period, the net savings of Alternative 2 are about $70 million compared to the Baseline in Alternative 1. The net savings of Alternative 2 are about $260 million compared to Alternative 3.

The final rule is planned for publication in the *Federal Register* in late 2008.

9. REFERENCES

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Appendix A: Input and Line Item Results for Alternative 1

Table A-1: One-time capital costs and annual costs for assumed legacy sites

At 3% discount

Alternative 1 (No Action) at 3%

	Number of Legacy Sites	One-time Capital and O&M Costs (per site)	Annual Cost (per site)	Govt funded decom cost (per site 2007$)	Total one-time cost (2007$)	Total annual costs (2007$)	Total decom cost in year 15 (2007$)	Total Costs (2007$)
Part 40: NRC Source Material Facilities								
Rare Metal Extraction Facility	1							
Stabilization and Control		$245,000	$31,000		$245,000	$370,076		$615,076
Decommissioning				$55,000,000			$35,302,407	$35,302,407
Inspection/leak detection		$0	$0					
Groundwater monitoring		$0	$0					
						Total federal funded decom cost		$35,917,483

	Stabilization and control costs	Decommissioning costs	Sum
Total NRC =	$615,076	$35,302,407	$35,917,483
Total Agreement States =	$2,460,304	$141,209,628	$143,669,932
	$3,075,380	$176,512,036	$179,587,415

At 7% discount

Alternative 1 (No Action) at 7%

	Number of Legacy Sites	One-time Capital and O&M Costs (per site)	Annual Cost (per site)	Govt funded decom cost (per site 2007$)	Total one-time cost (2007$)	Total annual costs (2007$)	Total decom cost in year 15 (2007$)	Total Costs (2007$)
Part 40: NRC Source Material Facilities								
Rare Metal Extraction Facility	1							
Stabilization and Control		$245,000	$31,000		$245,000	$282,345		$527,345
Decommissioning				$55,000,000			$19,934,531	$19,934,531
Inspection/leak detection		$0	$0					
Groundwater monitoring		$0	$0					
						Total federal funded decom cost		$20,461,876

	Stab and control costs	Decommissioning costs	Sum
Total NRC =	$527,345	$19,934,531	$20,461,876
Total Agreement States =	$2,109,381	$79,738,124	$81,847,506
	$2,636,727	$99,672,655	$102,309,382

Table A-2: Cost assumptions for legacy site one-time capital and annual costs

Alternative 1 Cost Estimate: Onsite Stabilization and Long Term Control (2007$)

	20-acre site Part 40
Capital Costs - Site Prep	
Mobilization	10,000
Construction surveys	20,000
Sediment and erosion control	10,000
Capital Costs - Construction	
Radiological and air monitoring	10,000
Installation of wells	33,000
Sediment and erosion controls	10,000
Security fencing (6' H, 6 ga, AL)	130,000
Capital Costs - Site Prep & Con	223,000
Capital Costs - Adm and Eng	22,000
Capital Costs - Total	245,000
Annual Surv and Monitoring Cost	
Radiation surveys	2,000
Site security/maintenance	12,000
NRC oversight fees	10,000
License renewal and inspection	4,000
Trustee fees and expenses	3,000
Annual Costs - Total	31,000

Notes:
Installation of wells: assume 6 wells on each site at a cost of $5,500 per well.
Security fencing: 20 acres = approx. 860,000 sq.ft; assume sq. perimeter = 1300 feet of fence each side with fence cost at $25 per linear foot.

Rare Metal Extraction Facility Site Parameters

Site boundary – 20 square acres (860,000 square feet)
Contaminated area – 200 square meters (2,152 square feet)
Contaminated soil volume – 200 square meters at 0.6 meters depth, equal to approximately 90 million pounds of sludge (3,500 pounds sludge/cubic meter).

Table A-3: Uranium movement through soil methodology and assumptions

Methodology

We used the following relationship to estimate the vertical movement of uranium through soil:

$$V = \frac{(P \times F / n)}{R}$$

where:

V	=	Vertical velocity of uranium in soil (cm/yr)
P	=	Annual precipitation (cm/yr)
F	=	Fraction of rainfall that infiltrates into the soil
n	=	Total porosity of soil (unitless)
R	=	Retardation Factor for uranium (unitless)

The retardation factor is calculated from the partition coefficient for uranium, and the bulk density and porosity of the soil as follows:

$$R = 1 + \frac{Kd \times \rho}{n}$$

where:

Kd	=	partition coefficient for uranium in soil (ml/g)
ρ	=	bulk density of soil (g/ml)

Assumptions

The values for annual precipitation, infiltration fraction, uranium partition coefficient, soil porosity, and bulk density are as listed below:

PARAMETER	VALUE	JUSTIFICATION
Annual Precipitation	178 cm/yr	Assumed a wet region of the US (70 in/yr)
Infiltration Fraction	0.3	See discussion below
Uranium Partition Coefficient	15 ml/g	Default value in NUREG/CR-5512
Soil Bulk Density	1.6 g/ml	Default value in NUREG/CR-5512
Total porosity	0.3	Default value in NUREG/CR-5512

The analysis estimates the uranium movement in the top several inches of soil. Because of the large uncertainties involved in estimating uranium movement, the parameters were chosen to estimate a reasonable upper bound on the vertical movement in soil. As such we used an annual rainfall for a very wet area of the continental United States and a low value for uranium partitioning in soil. The analysis also assumes that 30% of the annual rainfall percolates into the soil. We based this assumption on the data provided in tables 6.42 and 6.43 of NUREG/CR-5512 Vol. 3 that give an estimated infiltration rate of 12-14% for loam. This range was assumed low because it pertains to the fraction that makes it below the root zone, and a higher fraction would make it into the first few inches of soil. When using these parameter values, we calculated the maximum vertical movement of uranium to be 2.2 cm/yr or slightly less than 1 inch per year.

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Table A-4: Collective dose methodology and assumptions for legacy sites

Methodology

The equation for the present worth of future collective averted dose from NUREG 1757, Volume 2, Appendix N [page N-5] is:

$$PW(AD_{collective}) = P_D * A * 0.025 * F * \frac{Conc}{DCGL_w} * \frac{1 - e^{-(r+\lambda)*N}}{r+\lambda}$$

where P_D = population density for the critical group scenario (people/m^2)
A = area being evaluated (square meters, m^2)
F = effectiveness (fraction of the residual radioactivity removed by the remediation action)
$Conc$ = average concentration of residual radioactivity in the area being evaluated (in units of activity per unit volume for soils)
$DCGL_W$ = derived concentration guideline equivalent to the average concentration of residual radioactivity that would give a dose of 0.25 mSv/y (25 mrem/y) to the average member of the critical group (in the same units as *"Conc"*)
r = monetary discount rate (annual)
λ = radiological decay constant for the radionuclide (annual)
N = number of years over which the collective dose will be calculated

Assumptions

The equation above is based on Uranium contamination in soil for this Regulatory Analysis. The time period for the analysis is 15 years (N).

PARAMETER	VALUE	JUSTIFICATION
Population density	0.0004 p/m^2	Land value, p. N-10, NUREG 1757, V. 2
Area	200 m^2	Assumption for this analysis
Effectiveness	1.0	Assumption for this analysis
Conc (of U-234 and U-238)	200 pCi/g	Assumption for this analysis
DCGL (of U-234 and U-238)	14.1 pCi/g	Page B-3, NUREG 1757, V. 1
Monetary discount rate	3% and 7%	Page N-10, NUREG 1757, V. 2
Radiological decay constant		
U-234	2.8 E-06	Calculation
U-238	9.8 E-10	Calculation
Number of years	15	Assumption for this analysis

When using these parameter values, we calculated the collective averted dose to be 0.6 person-rem (rounded) at 3 percent discount rate. For the 5 legacy sites, the total averted dose is 3 person-rem. At $2000 per person-rem, the present worth of future collective averted dose is $6,000.

Appendix B: Input and Line Item Results for Alternative 2

Table B-1: Cost assumptions for ground water monitoring, inspection and leak detection, remediation and decommissioning

At 3% discount

Alternative 2 - preferred alternative - at 3%

	Number of Legacy Sites	One-time Capital and O&M Costs (per site)	Annual Cost (per site)	Ind funded decom cost (per site 2007$)	Total one-time cost (2007$)	Total annual costs (2007$)	Total decom cost in year 15 (2007$)	Total Costs (2007$)
Part 40: NRC Source Material Facilities								
Rare Metal Extraction Facility	1							
Stabilization and Control		$0	$0					
Decommissioning				$18,333,333			$11,767,469	$11,767,469
Remediation (year 2)		$1,200,000			$1,165,049			$1,165,049
Inspection/leak detection		$8,800	$4,500		$8,800	$53,721		$53,721
Groundwater monitoring		$46,000	$5,000		$46,000	$59,690		$59,690
						Total federal funded decom cost		$13,045,928

	Remediation, inspection, leak and gw monitoring costs	Decommissioning costs	Sum
Total NRC =	$1,278,459	$11,767,469	$13,045,928
Total Agreement States =	$5,113,836	$47,069,876	$52,183,712
	$6,392,295	$58,837,345	$65,229,640

At 7% discount

Alternative 2 - preferred alternative - at 7%

	Number of Legacy Sites	One-time Capital and O&M Costs (per site)	Annual Cost (per site)	Ind funded decom cost (per site 2007$)	Total one-time cost (2007$)	Total annual costs (2007$)	Total decom cost in year 15 (2007$)	Total Costs (2007$)
Part 40: NRC Source Material Facilities								
Rare Metal Extraction Facility	1							
Stabilization and Control		$0	$0					
Decommissioning				$18,333,333			$6,644,844	$6,644,844
Remediation (year 2)		$1,200,000			$1,165,049			$1,165,049
Inspection/leak detection		$8,800	$4,500		$8,800	$40,986		$40,986
Groundwater monitoring		$46,000	$5,000		$46,000	$45,540		$45,540
						Total federal funded decom cost		$7,896,417

	Remediation, inspection, leak and gw monitoring costs	Decommissioning costs	Sum
Total NRC =	$1,251,574	$6,644,844	$7,896,417
Total Agreement States =	$5,006,295	$26,579,375	$31,585,670
	$6,257,869	$33,224,218	$39,482,087

Table B-2: Alternative 2 Assumptions for 10 CFR Part 20

NRC Licensees

10 C.F.R.	Description	NRC Licensee	Hours	Wage Rate ($/hr)	Cost/Licensee (incl. clerical)	Total Cost	Annual Cost	Total 15 Yr 3% NPV	Total 15 Yr 7% NPV
Part 20									
20.1403(c)(1)	Requires use of trust for FA for restricted release site, and one percent real rate of return assumption for initial balance.	3	20	120	$2,400	$7,200	one-time	-	-
20.1403(c)(2)	Eliminates surety, insurance, or other guarantee as FA for restricted release site.	0	20	120	$2,400	$0	one-time	-	-
20.1404(a)(5)	Requires licensees who use alternate use criteria to provide sufficient financial assurance to enable a third party to perform work.	0	8	120	$960	$0	one-time	-	-
20.1406(c) and 20.1501	Estimated one-time expense for licensees with finanical assurance and liquid processes to understand changes to Part 20 and draft Regulatory Guide DG-4014.	500	1.5	120	$180	$90,000	one-time	-	-
20.1406(c)	Requires licensees, to the extent practical, to conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface.	16	80	120	$9,600	$153,600	$153,600	$1,833,667	$1,398,976
20.1501(a)	Requires licensees to perform surveys of areas, including the subsurface, that may be necessary to demonstrate compliance with regulations or to evaluate potential radiological hazards.	8	32	120	$3,840	$30,720	$30,720	$366,733	$279,795
20.1501(b)	Requires licensees to retain records from surveys of subsurface residual radioactivity with records important for decommissioning.	8	0	120	$0	$0	$0	$0	$0
							SUBTOTAL	$2,200,400	$1,678,771
							+ one-time costs	$97,200	$97,200
							TOTAL	$2,297,600	$1,775,971

Notes:

1. An estimated 16 source and byproduct material licensees would need to perform additional activities regarding identification and minimization of residual radioactivity within the site boundary [20.1406(c)].

2. An estimated 8 licensees will need to perform additional surveys that may be necessary to demonstrate compliance with regulations. The assumption is that the surveys are done quarterly and each require 8 hours labor [20.1501(a)].

3. The 8 licensees who perform additional surveys retain the survey records in records important for decommissioning, as they would have done under existing regulations [20.1501(b)].

Table B-3: Alternative 2 Assumptions for 10 CFR Part 30

NRC Licensees

10 C.F.R.	Description	NRC Licensee	Hours	Wage Rate ($/hr)	Cost/Licensee (incl. clerical)	Total Cost	Annual Cost	Total 15 Yr 3% NPV	Total 15 Yr 7% NPV
Part 30									
30.34(b)(2)	Requires application for transfer of license to include additional information about financial assurance.	3	0.5	120	$60	$180	$180	2,149	$1,639
30.35(c)(6)	If residual radioactivity exceeds 10 CFR 20.1402 unrestricted use criteria, prepare DFP and switch out of certification.	1	40	120	$4,800	$4,800	$1,600	$19,101	$14,573
	If residual radioactivity exceeds 10 CFR 20.1402 unrestricted use criteria, amend DFP.	2	16	120	$1,920	$3,840	$1,280	$15,281	$11,658
	If residual radioactivity does not exceed 10 CFR 20.1402 unrestricted use criteria, continue with certification or DFP.	0	0	120	$0	$0	$0	$0	$0
30.35(e)(1)	Requires DCE to be submitted for review and approval.	Licensees already comply				No Cost	-	-	-
30.35(e)(1)(i)(A)	Requires DCE to cover cost of decommissioning by an independent third party contractor.	Licensees already comply				No Cost	-	-	-
30.35(e)(1)(i)(B)	Requires DCE to cover cost of meeting criteria for unrestricted release unless demonstrate ability to meet restricted release criteria.	2	160	120	$19,200	$38,400	$12,800	$152,806	$116,581
30.35(e)(1)(i)(C)	Requires DCE to provide the volume of subsurface material containing residual radioactivity that will require remediation.	10	16	120	$1,920	$19,200	$6,400	$76,403	$58,291
30.35(e)(1)(i)(D)	Requires DCE to include adequate contingency.	Licensees already comply				No Cost	-	-	-
30.35(e)(1)(ii)	Requires DCE to explain and justify key assumptions.	Previously covered				No Cost	-	-	-
30.35(e)(2)	Requires assessment of whether occurrence of specified events requires revision of DCE.	10	16	120	$1,920	$19,200	$6,400	$76,403	$58,291
30.35(f)	Requires financial assurance mechanisms to include specified information; licensee cost to amend/review.	40	2	120	$240	$9,600	one-time	-	-
30.35(f)(1)	Requires prepayment FA to be in form of trust with trust and trustee acceptable to Commission; cost to obtain trust fund.	10	4	120	$1,520	$15,200	one-time	-	-
30.35(f)(2)	Eliminates line of credit.	0				$0	one-time	-	-
30.35(f)(3)	Requires external sinking fund to be in form of trust, eliminates other options and restricts combination of options.	0				$0	one-time	-	-
30.35(h)(1)&(2)	Requires licensees to monitor funds on quarterly basis and replenish funds.	5	4	120	$480	$2,400	$2,400	$28,651	$21,859
30.35(h)(3)	Requires licensees to notify NRC that it has replenished funding and provide new balance.	0	4	120	$720	$0	$0	$0	$0
							SUBTOTAL	$370,792	$282,892
							+ one-time costs	$24,800	$24,800
							TOTAL	$395,592	$307,692

Notes: 1. An estimated 2 licensees per year revise their decommissioning cost estimate (DCE) to represent the cost of meeting unrestricted use criteria [30.35(e)(1)(i)(B)].

2. An estimated 10 licensees per year consider volume of contaminated soil in the DCE [30.35(a)(1)(i)(C)].

Table B-4: Alternative 2 Assumptions for 10 CFR Part 30, Appendices

NRC Licensees

10 C.F.R.	Description	NRC Licensee	Hours	Wage Rate ($ per hour)	Cost per licensee (incl. clerical)	Total Cost	Annual Cost	Total 15 Year 3% NPV	Total 15 Year 7% NPV
Appendix A to Part 30									
II.A	Revises financial test to require total net worth to exclude net book value of the nuclear facility or site and net worth to exclude net book value and goodwill of nuclear facility and site.	23	24	120	$2,940	$67,620	$67,620	$807,243	$615,877
II.A.1.(ii)	Revises financial test to require net working capital and total net worth at least 6 times decommissioning funds being assured instead of 6 times DCE or cert.	23	0						
II.A.1.(iii)	Revises financial test to require $21 million in tangible net worth.	23			No Cost	No Cost	one-time	-	-
II.A.2.(i)	Revises financial test to specify bond ratings include adjustments of + or -.	Current licensees already comply			No Cost	No Cost	one-time	-	-
II.A.2.(iii)	Revises financial test to require $21 million in tangible net worth.	23			No Cost	No Cost	one-time	-	-
II.B	Require CPA to evaluate off-balance sheet transactions and provide opinion. CPA to verify bond rating meets terms of financial test.	23	24	120	$2,940	$67,620	$67,620	$807,243	$615,877
II.C.1	Requires parent company to provide annual documentation of continuing eligibility to use parent company guarantee.	23	4	120	$540	$12,420	$12,420	$148,269	$113,120
III.B	Require parent to provide funds immediately if regulatory prerequisites met	0	0						
III.C	Adds requirements for period financial must remain in effect	23	0						
	Requires standby trust to be created.	23	4	120	$1,520	$34,960	one-time	-	-
III.D	Requires standby trust to be revised to reflect a change in grantor or trustee.	3	2	120	$240	$720	$720	$8,595	$6,558
III.E	Adds requirement for joint and several liability of licensee and guarantor	23	8	120	$960	$22,080	$22,080	$263,590	$201,103
III.F	Adds provision that guarantee agrees to be subject to commission orders.	One time cost for current licensees for E, F, G, and H covered together under E							
III.G	Adds agreement that commission may declare assurance immediately due.	23	0						
III.H	Adds requirement that guarantor will notify NRC of bankruptcy action.	23	0						
Appendix C to Part 30									
II.A	Revises financial test to require tanglible net worth to exclude net book value of the nuclear facility and site, and any intangible assets, and net worth to be calculated to exclude the net book value and goodwill of the nuclear facility and siteebleotal	11	16	120	$2,960	$32,560	one-time	-	-
II.A.1	Revises financial test to require $21 million in tangible net worth.	11	0			No Cost	one-time	-	-
II.B.(2)	Requires CPA to evaluate off-balance sheet transactions and provide opinion	11	24	120	$2,940	$32,340	$32,340	$386,073	$294,550
II.B.(3)	Provide annual documentation of FT passage	11	8	120	$1,020	$11,220	$11,220	$133,944	$102,191
III.E	Notice to NRC if bond rating drops below required level	1	1						
III.F	Licensee will provide funds immediately if regulatory prerequisites met	0							
III.G	Requires standby trust to be created.	11	4	120	$540	$5,940	one-time		
III.H	NRC can require immediate payment in case of bankruptcy	0							
III.I	Licensee will notify NRC immediately in case of bankruptcy	0							

Table B-5: Alternative 2 Assumptions for 10 CFR Part 30, Appendices (continued)

NRC Licensees

Appendix D to Part 30									
II.A.(1)	Revises FT to require tangible net worth to exclude net book value of the nuclear facility and site and any intangible assets.	1			No Cost	No Cost	one-time	-	-
II.B.(1)	CPA evaluataes off-balance sheet transactions and provides opinion.	1	24	120	$2,940	$2,940	$2,940	$35,098	$26,777
II.B.(2)	Licensee provides annual documentation to NRC of continued eligibility to self-guarantee	1	4	120	$540	$540	$540	$6,446	$4,918
II.D	Guarantee includes commitment to provide funds immediately if regulatory prerequisites met	1	4	120	$1,520	$1,520	one-time	-	-
II.E	Requires standby trust to be created.	1	4	120	$1,520	$1,520	one-time		
II.F	Adds agreement that commission may declare assurance immediately due.	0							
II.G	Adds requirement that licensee will notify NRC of bankruptcy action	0							
Appendix E to Part 30									
II.A.(1)	Revises financial test to specify bond ratings include adjustments of + or -.	Current licensees already comply			No Cost	No Cost	one-time	-	-
II.B.(1)	Revises financial test to specify bond ratings include adjustments of + or -.	Current licensees already comply			No Cost	No Cost	one-time	-	-
II.C.(1)	Requires CPA to evaluate off-balance sheet transactions and provide opinion	11	4	120	540	$5,940	5940	$70,911	$54,101
II.C.(2)	Requires licensee to provide annual documentation of continued eligibility to use guarantee	11	1	120	180	$1,980	1980	$23,637	$18,034
III.D	Agreement to provide funds immediately if regulatory prerequisites met	11	4	120	$1,520	$16,720	one-time	-	-
III.E	Agreement to notify NRC within 20 days if bond ratings drop below required level	1	1	120	180	$180	180	$2,149	$1,639
III.F	Requires standby trust to be created.	11	4	120	$1,520	$16,720	one-time		
III.G	Adds agreement that Commission may declare assurance immediately due	0							
III.H	Adds requirement that guarantor will notify NRC of bankruptcy action.	0							
							SUBTOTAL	$2,693,198	$2,054,745
							+ one-time costs	$109,940	$109,940
							TOTAL	$2,803,138	$2,164,685

Table B-6: Alternative 2 Assumptions for 10 CFR Part 40

NRC Licensees

	Description	NRC Licensee	Hours	Wage Rate ($/hr)	Cost/Licensee (incl. clerical)	Total Cost	Annual Cost	Total 15 Yr 3% NPV	Total 15 Yr 7% NPV
Part 40									
40.36(c)(5)	If residual radioactivity exceeds 10 CFR 20.1402 unrestricted use criteria, prepare DFP and switch out of certification.	1	40	120	$4,800	$4,800	$1,600	$19,101	$14,573
	If residual radioactivity exceeds 10 CFR 20.1402 unrestricted use criteria, amend DFP.	2	16	120	$1,920	$3,840	$1,280	$15,281	$11,658
	If residual radioactivity does not exceed 10 CFR 20.1402 unrestricted use criteria, continue with certification or DFP.	0	0	120	$0	$0	$0	$0	$0
40.36(d)(1)(i)(A)	Requires DCE to cover cost of decommissioning by an independent third party contractor.	Licensees already comply				No Cost	-	-	-
40.36(d)(1)(i)(B)	Requires DCE to cover cost of meeting criteria for unrestricted release unless demonstrate ability to meet restricted release criteria.	0	160	120	$19,200	$0	$0	$0	$0
40.36(d)(1)(i)(C)	Requires DCE to include estimate of volume of onsite subsurface material containing residual radioactivity.	5	16	120	$1,920	$9,600	$3,200	$38,201	$29,145
40.36(d)(1)(i)(D)	Requires DCE to include adequate contingency factor.	Licensees already comply				No Cost	-	-	-
40.36(d)(1)(ii)	Requires DCE to explain and justify key assumptions	Previously covered				No Cost	-	-	-
40.36(d)(2)	Requires assessment of whether occurrence of specified events requires revision of DCE	5	16	120	$1,920	$9,600	$3,200	$38,201	$29,145
40.36(e)	Requires financial assurance mechanisms to include specified information; licensee cost to amend/review mech	20	2	120	$240	$4,800	one-time	-	-
40.36(e)(1)	Requires prepayment FA to be in form of trust with trust and trustee acceptable to Commission; cost to obtain trust fund	17	4	120	$1,520	$25,840	one-time	-	-
40.36(e)(2)	Eliminates line of credit	0				$0	one-time	-	-
40.36(e)(3)	Requires external sinking fund to be in form of trust, eliminates other options and restricts combination of options.	0				$0	one-time	-	-
40.36(f)(1)&(2)	Requires licensees to monitor funds on quarterly basis and replenish funds.	5	4	120	$480	$2,400	-	-	-
40.36(f)(3)	Requires licensees to notify NRC that it has replenished funding and provide new fund balance	0	4	120	$720	$0	$0	$0	$0
40.46(b)(1)	Requires application for transfer of license to include specified information	1	0.5	120	$60	$60	$60	$716	$546
40.46(b)(2)	Requires application for transfer of license to include FA for decommissioning	1	40	120	$4,800	$4,800	$4,800	$57,302	$43,718
App A, II.9(a)	Allows surety arrangements to be based on a revised plan with a higher cost estimate.	Licensees already comply				No Cost			
App A, II.9(b)(1)	Requires a detailed decommissioning cost estimate for an amount adequate for an independent contractor with a contingency factor.	0						-	-
App A, II.9(b)(2)	Requires the cost estimate to include an estimate of the amount of contaminated material in the onsite subsurface.	Licensees already comply				No Cost			
App A, II.9(b)(3)	Requires the decommissioning funding plan to explain and justify key assumptions.	Licensees already comply				No Cost			
App A, II.9(b)(4)	Requires the decommissioning funding plan to describe the method of assuring funds for decommissioning.	Licensees already comply				No Cost			
App A, II.9(f)(1)-(11)	Requires the amount of surety liability to be adjusted to recognize increases or decreases resulting from a list of specified events.	Licensees already comply				No Cost			
App A, II.9(i)	Eliminates cash deposits and CD from approved mechanisms, and adds trust funds and parent company guarantee as approved method of finanical assurance.	0						-	-
							SUBTOTAL	$168,802	$128,786
							+ one-time costs	$30,640	$30,640
							TOTAL	$199,442	$159,426

Table B-7: Alternative 2 Assumptions for 10 CFR Part 50

NRC Licensees

	Description	NRC Licensee	Hours	Wage Rate ($/hr)	Cost/Licensee (incl. clerical)	Total Cost	Annual Cost	Total 15 Yr 3% NPV	Total 15 Yr 7% NPV
Part 50									
50.75(e)(1)(iii)(A)	Eliminates use of line of credit for decommissioning FA.	0	2	120	$240	$0	-	-	-
50.82(a)(4)(i)	Submit PSDAR to NRC with specified information.	3	0	120	$0	$0	-	-	-
50.82(a)(4)(i)(A)	Report actual cost of decommissioning the reactor facility.	3	0	120		$0	-	-	-
50.82(a)(4)(i)(B)	Report on spent fuel management plan funding.	10	4	120	$480	$4,800	$2,400	$28,651	$21,859
50.82(a)(8)(v)	Submit annual financial assurance status reports to NRC.	10	8	120	$960	$9,600	$4,800	$57,302	$43,718
50.82(a)(8)(vi)	Submit additional finanical assurance to cover estimated cost of decommissioning.	0	2	120	$240	$0	-	-	-
50.82(a)(8)(vii)	Submit annual report of status of managing irradiated fuel.	10	8	120	$960	$9,600	$4,800	$57,302	$43,718
							SUBTOTAL	$143,255	$109,295
							+ one-time costs	$0	$0
							TOTAL	$143,255	$109,295

Notes: 1. An estimated 10 licensees per year, with power reactors in decommissioning, submit financial assurance status report [50.82(a)(8)(v)] and irradiated fuel management report [50.82(a)(8)(vii)].

Table B-8: Alternative 2 Assumptions for 10 CFR Part 70

NRC Licensees

	Description	NRC Licensee	Hours	Wage Rate ($/hr)	Cost/Licensee (incl. clerical)	Total Cost	Annual Cost	Total 15 Yr 3% NPV	Total 15 Yr 7% NPV
Part 70									
70.25(c)(5)	If residual radioactivity exceeds 10 CFR 20.1402 unrestricted use criteria, prepare DFP and switch out of certification.	1	40	120	$4,800	$4,800	$1,600	$19,101	$14,573
	If residual radioactivity exceeds 10 CFR 20.1402 unrestricted use criteria, amend DFP.	2	16	120	$1,920	$3,840	$1,280	$15,281	$11,658
	If residual radioactivity does not exceed 10 CFR 20.1402 unrestricted use criteria, continue with certification or DFP.	0	0			$0	-	-	-
70.25(e)(1)(i)(A)	Requires DCE to cover cost of decommissioning by an independent third party contractor.	Licensees already comply				No Cost	-	-	-
70.25(e)(1)(i)(B)	Requires DCE to cover cost of meeting criteria for unrestricted release unless demonstrate ability to meet restricted release criteria.	0	160	120		$0	$0	$0	$0
70.25(e)(1)(i)(C)	Requires DCE to include estimate of volume of onsite subsurface material containing residual radioactivity	4	16	120	$1,920	$7,680	$2,560	$30,561	$23,316
70.25(e)(1)(i)(D)	Requires DCE to include adequate contingency factor.	licensees already comply				No Cost	-	-	-
70.25(e)(1)(ii)	Requires DCE to explain and justify key assumptions	Previously covered				No Cost	-	-	-
70.25(e)(2)	Requires assessment of whether occurrence of specified events requires revision of DCE	4	16	120	$1,920	$7,680	$2,560	$30,561	$23,316
70.25(f)	Requires financial assurance mechanisms to include specified information; licensee cost to amend/review	40	2	120	$240	$9,600	one-time	-	-
70.25(f)(1)	Requires prepayment FA to be in form of trust with trust and trustee acceptable to Commission; cost to obtain trust fund	8	4	120	$1,520	$12,160	one-time	-	-
70.25(f)(2)	Eliminates line of credit	0				$0	one-time	-	-
70.25(g)(3)	Requires external sinking fund to be in form of trust, eliminates other options and restricts combinations of options	0				$0			
70.25(h)(1)&(2)	Requires licensees to monitor funds on quarterly basis and replenish funds.	5	4	120	$480	$2,400	$800	$9,550	$7,286
70.25(h)(3)	Requires licensees to notify NRC of shortfalls in funding and actions to replenish funding.	0	4			$0	-	-	-
70.36(a)(2)(i)	Requires application for transfer of license to include specified information	1	0.5	120	$60	$60	$60	$716	$546
70.36(a)(2)(ii)	Requires application for transfer of license to include FA for decommissioning	1	40	120	$4,800	$4,800	$4,800	$57,302	$43,718
							SUBTOTAL	$163,072	$124,414
							+ one-time costs	$21,760	$21,760
							TOTAL	$184,832	$146,174

Notes: 1. An estimated 4 licensees per year consider volume of contaminated soil in the DCE [70.25(e)(1)(i)(C)].

Table B-9: Alternative 2 Assumptions for 10 CFR Part 72

NRC Licensees

	Description	NRC Licensee	Hours	Wage Rate ($/hr)	Cost/Licensee (incl. clerical)	Total Cost	Annual Cost	Total 15 Yr 3% NPV	Total 15 Yr 7% NPV
Part 72									
72.30(b)(2)(i)	Requires DCE to cover cost of decommissioning by an independent third party contractor.	Licensees already comply				No Cost	-	-	-
72.30(b)(2)(ii)	Requires DCE to include adequate contingency factor.	Licensees already comply				No Cost	-	-	-
72.30(b)(2)(iii)	Requires DCE to cover cost of meeting criteria for unrestricted release unless demonstrate ability to meet restricted release criteria.	0				$0	-	-	-
72.30(b)(3)	Requires DCE to explain and justify key assumptions.	Covered previously				No Cost	-	-	-
72.30(b)(5)	Requires DCE to include estimate of volume of onsite subsurface material containing residual radioactivity that will require remediation.	0	40	120	$4,800	$0	$0	$0	$0
72.30(c)	Requires assessment of whether occurrence of four specified events requires revision	20	16	120	$1,920	$38,400	$12,800	$152,806	$116,581
72.30(d)	If residual radioactivity exceeds 10 CFR 20.1402 unrestricted use criteria, revise DFP within one year of surveys.	0	16	120	$1,920	$0	$0	$0	$0
72.30(e)	Requires financial assurance mechanisms to include specified information.	0	2	120	$240	$0	one-time	-	-
72.30(e)(1)	Requires prepayment FA to be in form of trust with trust and trustee acceptable to Commission.	0				$0	one-time	-	-
72.30(e)(2)	Eliminates line of credit	0				$0	one-time	-	-
72.30(g)	Requires licensees to monitor funds on an annual basis, replenish funds and notify NRC of funding shortfalls.	15	4	120	$480	$7,200	$7,200	$85,953	$65,577
72.50(b)(3)	Requires application for transfer of license to include specified info	0				$0	-	-	-
72.80	Requires records to be forwarded to NRC and transferred to new licensee if licensed activities are transferred.	0				$0	-	-	-
							SUBTOTAL	$238,759	$182,158
							+ one-time costs	$0	$0
							TOTAL	$238,759	$182,158

Notes:
1. An estimated 15 site-specific ISFSI licensees per year monitor financial assurance funds on an annual basis [72.30(g)].
2. An estimated 20 ISFSI general and specific licensees per year comply with 72.30(c).

Appendix C: Input and Line Item Results for Alternative 3

Table C-1: Detailed Assumptions and Results for Collateral Requirement In Alternative 3

Input	Value
All Parts	
% Use Collateral	67%
% Use Alternative Mechanism	33%
Collateral Cost (average)	2.5%
One-Half of Collateral Users	0%
One-Half of Collateral Users	5%
Alternative Mechanism Cost	3.0%
FT Test Submission	$4,000
Years	15
Total One-Time Cost: Alternative Mechanism	$5,000
Total One-Time Cost: Collateral	$4,200
Part 30	
NRC Licensees	30
Agreement States	120
Financial Assurance (total)	$230,000,000
Amount of FA (Appendix A)	*$110,000,000*
Amount of FA (Appendix C)	*$90,000,000*
Amount of FA (Appendix E)	*$30,000,000*
Part 40	
NRC Licensees	6
Agreement States	24
Financial Assurance (total)	$310,000,000
Amount of FA (Appendix A)	*$180,000,000*
Amount of FA (Appendix C)	*$130,000,000*
Part 70	
NRC Licensees	6
Agreement States	0
Financial Assurance (total)	$200,010,000
Amount of FA (Appendix A)	*$150,000,000*
Amount of FA (Appendix C)	*$40,000,000*
Amount of FA (Appendix D)	*$10,000,000*
Amount of FA (Appendix E)	*$10,000*
Part 72	
NRC Licensees	1
Agreement States	0
Financial Assurance (total)	$40,000,000
Amount of FA (Appendix C)	*$40,000,000*

	Amount Per Licensee	Cost Per Licensee	Total Annual Cost for all NRC and AS licensees	Total 15 Year 3% NPV	Total 15 Year 7% NPV
Part 30					
Alternative Mechanism	$511,111	$15,333	$2,300,000	$27,457,251	$20,948,202
Collateral	$1,022,222	$29,556	$4,433,333	$52,924,846	$40,378,419
Part 40					
Alternative Mechanism	$3,444,444	$103,333	$3,100,000	$37,007,599	$28,234,533
Collateral	$6,888,889	$176,222	$5,286,667	$63,111,883	$48,150,505
Part 70					
Alternative Mechanism	$11,111,667	$333,350	$2,000,100	$23,877,064	$18,216,739
Collateral	$22,223,333	$559,583	$3,357,500	$40,081,617	$30,579,821
Part 72					
Alternative Mechanism	-	-	-	-	-
Collateral	$40,000,000	$1,004,000	$1,004,000	$11,985,687	$9,144,346
			SUBTOTAL: Alt. Mech.	$88,341,913	$67,399,474
			+ one-time costs	$311,667	$311,667
			SUBTOTAL: Collateral	$168,104,033	$128,253,091
			+ one-time costs	$523,600	$523,600
			TOTAL: Alt. Mech. and Collateral	$257,281,213	$196,487,832

Alternative 3 assumes all of the monitoring and changes to financial assurance considered in Alternative 2, and in addition Alternative 3 assumes a security interest in collateral to support the decommissioning assurance pledged in the parent guarantee and self guarantee.

This appendix describes the method and presents input and line item results to estimate total costs to NRC licensees if a collateral requirement was placed on the amount guaranteed using a parent guarantee or a self guarantee financial assurance mechanism for decommissioning. Estimates are provided of the number of licensees that would be affected and the costs that they or their parent companies would incur.

The analysis is based on contacts with financial administrators of companies and bankers, and assumes the following:

- Status of potential collateral. Under Alternative 3 of the rule, the NRC would require that the collateral offered by licensees be liquid and that it not be encumbered by more senior security interests (i.e., that it not already have been pledged as security to someone else). However, it is likely that numerous firms will already have pledged as collateral the liquid

assets that would be most desirable as collateral to the NRC, in particular, the accounts receivable of the companies. Accounts receivable are frequently pledged as collateral for short-term revolving lines of credit used by companies for their operating funds. Banks taking accounts receivable as collateral for revolving lines of credit generally take the full amount of accounts receivable, in part because they consider accounting and recordkeeping for only a portion of the receivables to be too difficult to administer and in part to avoid conflicts with other creditors. This analysis assumes that those licensees choosing to use collateral will be able to identify collateral that is acceptable to the NRC and that is not subject to a security interest that would be senior to the interest granted the NRC. The estimated annual cost of the collateral is estimated as 5% of the face value of the collateral supplied.

- Collateral requirements for alternative financial mechanisms. This analysis assumes that one-third of the licensees will be able to secure alternate mechanisms without being required to supply additional collateral, and therefore will choose not to continue to use a parent guarantee or self-guarantee. Instead, they will shift to an alternate financial mechanism.

- Cost of alternative mechanisms. Fees for a letter of credit issued to an existing customer of a financial institution can range from 2 to 5 percent of the face value, but are likely to be in the range of 2 to 3 percent. This analysis assumes that the annual fees for the alternative mechanisms will be 3% of their face value.

- Alternative uses of capital. A firm with free capital available for collateral would consider alternative uses for the capital, and would attempt to find alternative investments that would bring a return in the 10 to 15 percent range. At a minimum, funds invested in overnight or short-term accounts could bring a return of at least 5 percent. Thus, firms would be reluctant to commit capital for use as collateral unless no alternative opportunities for investment were available. However, the cost of an alternate financial mechanism if it must be supported by collateral (i.e., the cost of the fees plus the cost of the collateral) would be greater than the cost of collateral alone. This analysis therefore assumes that two-thirds of all licensees currently using a parent company guarantee or self-guarantee will continue to use those mechanisms and supply collateral. The analysis further assumes that half will have a competing alternative use for the collateral and therefore will allocate a cost to it, and the other half will have no alternative use that requires them to allocate a cost to the collateral.

Based on these factors, approximately two-thirds of the licensees now using guarantees are expected to continue using them and to supply collateral under the new requirement. The other firms (one-third) now using guarantees are expected to shift to another financial assurance mechanism. In both cases, substantial additional costs compared to the current rule will be incurred. Table C-1 provides estimates of the costs associated with these two alternative approaches by licensees to complying with proposed new requirements.

Appendix D: Input Assumptions for Power Reactor Pre-Rule Analysis

This appendix provides the input assumptions to estimate the costs of the voluntary GPI at a nuclear power plant. This is an estimate of the licensee costs associated with implementation of the rule requirements under 10 CFR 20.1406(c) and 20.1501, in the absence of any existing ground water monitoring, analysis, and reporting in place at the time the rule becomes effective. NRC staff is aware that power reactor licensees will not necessarily be required to drill more monitoring wells than were in place before the GPI, and that the monitoring and operating procedures used at each site will be highly site-specific. A cost estimate is required for this Regulatory Analysis. NRC staff has used its industry experience and engineering judgement in arriving at the input assumptions shown below.

As discussed in Section 6, each power reactor licensee has committed to put in place for the GPI a set of site specific actions with objectives and acceptance criteria to demonstrate that the objectives have been met. An assumption is made in Table D-1 that 10 ground water monitoring wells are installed at each nuclear plant site. The costs shown in Table D-1 are not expected to be additional costs incurred by power reactor licensees, but rather are the estimated one-time and annual recurring expenditures to support the GPI.

Table D-1
Capital and Annual Recurring O&M Costs to Support the GPI at a Two-Unit Site

Capital (2007$)		
1. Define Objectives and Develop Conceptual Site Model		
a. Collect and evaluate site information		
b. Perform site-characterization studies		
	Subtotal	$150,000
2. Hydro-Geologic Site Characterization		
a. Conceptual subsurface investigation		
b. Detailed site characterization		
c. Define drilling method and well types		
d. Define monitoring zones		
e. Define well construction, locations and materials		
	Subtotal	$100,000
3. Install Ground Water Monitoring System		
a. Install sample wells (10, 150 ft deep, 2"-4" diameter)		
b. Field test and document well performance		
c. Analyze sample data to confirm/adjust site model		
d. Install additional wells (10, 150 ft deep, 2"-4" in diameter)		
	Subtotal	$600,000
4. Reporting		
a. Establish and implement new reporting requirements		
	Subtotal	$ 50,000
	Total Capital	$900,000
Recurring O&M (2007$)		
1. Annual O&M to support GPI		$ 60,000

Total capital (2007$) for 65 nuclear power plant sites is $58.5 million. The present value of 65 sites with annual O&M for GPI of $60,000 per site is $46 million and $35.5 million at 3 percent and 7 percent discount rates, respectively. The total GPI, over a 15 year period, is $105 million and $94 million at 3 percent and 7 percent discount rates, respectively.

Environmental Assessment for Final Rule - Decommissioning Planning

U.S. Nuclear Regulatory Commission
September 2008

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ACRONYMS

ALARA	as low as reasonably achievable
EA	environmental assessment
EIS	environmental impact statement
GPI	Groundwater Protection Initiative
NEPA	National Environmental Policy Act of 1969
NRC	Nuclear Regulatory Commission
RA	Regulatory Analysis
TI	Temporary Instruction

1. INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) is revising its regulations to improve decommissioning planning and thereby reduce the likelihood that any current NRC licensed operating facility will become a "legacy site." A "legacy site" is a facility that is decommissioning and has an owner who cannot complete the decommissioning work for technical or financial reasons.

Legacy sites have two common characteristics: (1) subsurface residual radioactivity in amounts greater than anticipated and (2) insufficient funds to remediate the radiological contamination to levels that will meet the NRC's decommissioning criteria. This rulemaking is, therefore, aimed at improving licensee's decommissioning financial planning and improving licensee's awareness of the presence and amounts of significant residual radioactivity onsite. The changes to financial assurance requirements in this final rule have no direct impact on the environment and are not evaluated in this environmental assessment (EA). This EA evaluates whether the amended regulations that are intended to promote the early identification of residual radioactivity at existing and future operating sites will have any significant environmental impact.

1.1 Background

The NRC's regulations for implementing Section 102(2) of the National Environmental Policy Act of 1969 (NEPA), as amended, are contained in Subpart A of 10 CFR Part 51. These regulations require that an environmental impact statement (EIS) or an environmental assessment be prepared for all licensing and regulatory actions that are not classified as categorical exclusions or as otherwise not requiring environmental review. This EA is being prepared to determine whether this final rule has the potential to cause significant environmental impacts, requiring the preparation of an EIS.

The NRC terminates several hundred licenses each year with most requiring little, if any, remediation to meet NRC's related decommissioning criteria. In a few cases, operating conditions have led to large amounts of chemical and long-lived radioactive contamination being released to the subsurface environment over an extended period of time. Acute doses from these releases are typically below the limits imposed by 10 CFR Part 20, and thus the releases are rarely subject to NRC regulatory action. However, with many facilities operating for decades, numerous unremediated minor spills, accumulated over the lifetime of a facility, may lead to unanticipated levels of subsurface contamination that have not been adequately factored into decommissioning costs. If a licensee first learns of significant subsurface residual radioactivity at the start of decommissioning, after the facility has been shut down and the owner has no operating revenue, there is the possibility of a legacy site. Historically, in a few of these instances, the State or Federal government has provided funds to remediate the site consistent with unrestricted use of the site after license termination. For those sites that are highly contaminated, the delay in cleanup has introduced additional risk associated with occupational health and safety during decommissioning.

Another common factor that may eventually lead to costly environmental contamination is that the cost to dispose of radioactive material can be very high. Packaging and transportation requirements, the limited number of licensed disposal sites, and disposal

surcharges contribute to the high costs. The cost of disposal may affect the licensee's business practices. For example, a company may opt to store its waste onsite rather than shipping it offsite. Storing the waste on-site could increase the risk of later environmental contamination at the site. Such contamination could result in substantially higher site remediation costs, possibly exceeding available financial resources, at the time of facility decommissioning.

1.2 Need for the Final Rule

The final rule is intended to reduce the likelihood of future legacy sites among current operating facilities. Survey and related requirements are amended to ensure that significant residual radioactivity is detected in a timely manner, and financial assurance regulations are amended to ensure that adequate decommissioning funds will be available when needed.

The proposed rule on Decommissioning Planning was published on January 22, 2008 (73 FR 3812), for a 75-day public comment period. The Nuclear Energy Institute (NEI) and several other stakeholders requested an extension of 90 days to provide review of issues raised in the proposed rule. The NRC extended the comment period by 30 days, until May 8, 2008 (73 FR 14946). The NRC received 35 comment letters on the proposed rule. Two letters provided comments on the draft EA that was part of the proposed rulemaking package.

One commenter agreed with draft EA's conclusion that monitoring wells, if required at licensed sites, will result in small environmental impacts.

The other commenter disagreed with the draft EA's finding of no significant environmental impact and stated that such a finding violates the NEPA. The commenter believed the NRC must perform additional environmental analyses because the final rule does not go far enough in requiring prompt remediation of spills and leaks during facility operations, and that any deferral of cleanup activities could have a large impact on environmental resources, nearby properties, and public health. The NRC disagrees with this comment for the reasons stated in the final rule *Federal Register Notice* (section III, response to comment D.7).

1.3 Final Rule Action (Alternative 2: Monitoring with Financial Assurance Changes)[1]

The final rule action evaluated in this EA is a set of linked amendments that (a) revise 10 CFR 20.1406 to make its waste minimization requirements applicable to licensees as well as applicants; and (b) revise the 10 CFR 20.1501 survey requirements by replacing its undefined term "radioactive material" with "residual radioactivity," a term already defined in 10 CFR Part 20. This defined term includes subsurface contamination within its scope. Due to the need to better ascertain the extent of existing contamination within the subsurface during facility operations, both 10 CFR 20.1406(c) and 20.1501(a) are being worded to include subsurface contamination within their scope. Consistent with this approach, both provisions contain the "residual radioactivity" term, which serves to reinforce the intended linkage between these provisions. These changes are consistent with NRC policy that licensees conduct operations so as to minimize the generation of waste, in order to facilitate later facility decommissioning and to

[1] Alternatives in this EA are meant to be consistent with the alternatives in the Regulatory Analysis (RA). In the RA, Alternative 1 is the No Action Alternative. Alternative 2 is the preferred alternative. Alternative 3 adds collateral requirements to those proposed in the preferred approach.

achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA). The purpose of these amendments is to focus licensee attention on subsurface residual radioactivity as a potential radiological hazard in later decommissioning activities.

NRC staff considered the technical basis information and came to the conclusion that the large majority of NRC and Agreement State licensees are not expected to have significant quantities of residual radioactivity because they possess small amounts of short-lived byproduct material or byproduct material that is encased in a capsule designed to prevent leakage or escape of the byproduct material (i.e., a sealed source). For NRC licensees who have subsurface residual radioactivity with no ground water implications, a minimal, routine monitoring plan may remain in effect through license termination. Many NRC licensees with a potential for subsurface residual radioactivity currently have onsite monitoring procedures that likely would provide sufficient information to satisfy the amendments to § 20.1406(c) and § 20.1501(a). Based on review of the technical basis information supporting this rule, licensees that are not expected to be affected by the amendments, by the effective date of the final rule, include nuclear power plants, research and test reactors, uranium fuel fabrication plants, critical mass licensees, uranium enrichment plants, UF6 production plants, sewage treatment plants, byproduct material plants that are not rare earth extraction facilities, and uranium recovery facilities.

For power reactors, onsite monitoring programs are in place to meeting existing effluent release regulations in 10 CFR § 50.36a and § 20.1301. In addition, the voluntary industry Ground Water Protection Initiative (GPI) includes a site risk assessment at each power plant based on plant design and work practices to evaluate credible pathways for licensed material to reach the ground water. Each power plant has sampling and analysis protocols for ground water and soil. In May 2008, NRC completed its Temporary Instruction 2515/173 (ADAMS ML072950622) that will be used by inspectors to assess if licensees have completed the voluntary industry Groundwater Protection Initiative. The Temporary Instruction includes inspection of licensees' Annual Reporting whereby the power reactor licensees will have documented onsite groundwater sample results for each calendar year in the Annual Radiological Environmental Operating Report (AREOR) or the Annual Radiological Effluent Release Report (ARERR), as part of their annual Environmental Reports. This information is publicly available in ADAMS.

Uranium fuel fabrication plants and the dry process natural uranium conversion facility also perform onsite surveys to detect radioactive release to the ground water. These facilities report survey results pursuant to existing reporting requirements in 10 CFR § 70.59 and § 40.65.

Uranium enrichment plants considered in this EA are of two types: the Department of Energy (DOE) gaseous diffusion plants and centrifuge enrichment plants. The two DOE gaseous diffusion plants, leased for operation by United States Enrichment Corporation (USEC), are regulated under the 10 CFR Part 76 certification process. Both plants have substantial subsurface and ground water contamination from operations during the time these facilities were under the control of the Atomic Energy Commission and the Department of Energy (DOE), and prior to certification by NRC. The DOE is currently conducting an extensive ground water monitoring program at both plants. Centrifuge enrichment plants do not use large amounts of fluids in production processes and are not thought to pose risks of subsurface

contamination.

NRC staff estimates that one rare earth and extraction material licensee and four Agreement State rare earth and extraction material licensees will be affected by the final rule amendments to 10 CFR 20.1406(c) and 20.1501. Therefore, for the purpose of this EA, the final rule action would only affect these five hypothetical licensees.

2.0 ENVIRONMENTAL IMPACTS OF THE FINAL RULE

Under the final rule, § 20.1406(c) will require licensees to conduct their operations so as to minimize the introduction of residual radioactivity into the site, including the subsurface.

10 CFR 20.1501(a) uses the defined term "residual radioactivity" to include subsurface contamination within its scope, and is thus linked with 10 CFR 20.1406(c), which uses the same term. Together, the amended 10 CFR 20.1501(a) and 20.1406(c) specify that compliance with 10 CFR Part 20 survey and recordkeeping requirements may be a necessary part of effectively planning for decommissioning, and to demonstrate compliance with effluent dose limits. 10 CFR 20.1501(b) will require licensees to retain records from surveys of subsurface residual radioactivity with records important for decommissioning.

The Statements of Consideration and draft Regulatory Guide DG-4014, "Radiological Surveys and Monitoring During Operations," released with the final rule specify that the intent of the rule is to address amounts of residual radioactivity at a site that are significant to achieve effective decommissioning planning. For operating facilities, significant residual radioactivity is a quantity of radioactive material that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402.

There are a variety of monitoring methods to evaluate subsurface characteristics, and these are highly site specific with respect to their effectiveness. As indicated above, for purposes of this EA it is assumed that five licensees will be affected by this final rule. It is assumed that the five licensees will install ground-water monitoring wells and surface monitoring devices at their sites. The installation of these monitoring devices and wells is generally expected to result in small environmental impacts due to their very localized nature.

2.1 Public and Occupational Health Impacts

Under the final rule, there is the potential for increased occupational exposure to radiological and chemical substances during sampling and testing. Such exposures are not expected to be significant, because they would likely remain within 10 CFR Part 20 limits and be ALARA. Monitoring will allow the licensees to be more cognizant of subsurface contamination. If such contamination is found to be at significant levels, licensees may opt to remediate it in the near-term, rather than waiting until decommissioning. Doing so would avoid incurring higher occupational exposure rates in the future, by which time additional amounts of contamination may have accumulated. Licensees may alternatively choose to provide increased decommissioning funding upon discovering significant amounts of subsurface contamination. Having sufficient funds for decommissioning will better ensure that the licensed area is adequately remediated during decommissioning, thus ensuring adequate protection of public health and safety and the environment.

In most instances, the activities involved when installing leak detection systems and monitoring wells do not create transport mechanisms for radioactivity to leave the site and expose the public. Therefore, offsite doses are expected to be negligible from installing and implementing onsite monitoring.

2.2 Noise and Visual Impacts

The staff expects that the installation of detection equipment and the implementation of the monitoring program will create no more noise than any other operation at a licensed facility. Drilling monitoring wells may create loud noises, but it will be short term and only lasting a few days or weeks.

The leak detection equipment and the portions of the monitoring wells visible above grade do not create any adverse visual impacts. They are not very visible from close distances onsite and almost impossible to see from further distances offsite.

2.3 Transportation Impacts

Installing and maintaining an onsite monitoring program will require the delivery of equipment to the licensee. These excess deliveries are not expected to increase the average traffic volume to the licensee because the delivery of equipment will last only a few days and the number and size of vehicles required to deliver the equipment will be small.

If, due to the monitoring imposed by this rulemaking, a licensee finds that there has been subsurface contamination onsite, the licensee may choose to remediate the contamination prior to decommissioning by shipping the waste offsite. Licensees will likely make this decision in the cases where the waste consists of long-lived radionuclides that are not expected to decay substantially before site decommissioning. Though radiological shipments are highly regulated to ensure public health and safety, there is a potential for these waste shipments and disposal to result in public exposures. However, if the proposed action were not taken, this waste would eventually have to be shipped and disposed offsite during decommissioning. Therefore, the potential for exposure to the public would not increase due to the proposed action.

Moreover, if a licensee becomes aware of significant levels of residual radioactivity in the subsurface, the licensee and the NRC will be better able to ensure the protection of public health and safety and the environment by identifying and resolving the source of the contamination, and by taking steps to ensure that it is not allowed to migrate offsite. Early identification also gives the licensee more time to plan waste remediation strategies that are both safe and cost effective.

3.0 ALTERNATIVES TO THE FINAL RULE

As required by Section 102(2)(E) of the NEPA (42 U.S.C.A. 4332(2)(E)), the NRC has considered possible alternatives to the final rule. The staff considered the following alternatives to the proposed action:

3.1 Alternative 1: No-Action Alternative

This alternative provides a baseline to assess the other two alternatives. Under the No-Action alternative, the Commission would not adopt changes to the current regulations. It assumes no changes are made to the regulations and there will be additional legacy sites from currently operating facilities licensed by the NRC and Agreement States. The basis for this assumption of additional legacy sites is documented in section 3.1 of the final rule Regulatory Analysis. Consistent with the requirements in NUREG/BR-0058, Revision 4, "the alternatives examined in the regulatory analysis should correspond as much as possible to the alternatives examined in the EIS or EA [page 38]." Thus, the No-Action alternative assumes additional legacy sites.

If the NRC chooses this alternative, rulemaking would not be pursued and the current regulations would be maintained. The current regulatory focus is on preventing acute radiological hazards based on licensee compliance with existing radiation exposure limits. Although there are only a handful of legacy sites, these sites require a disproportionate amount of time to regulate, pose a radiological hazard, and present long-term concerns as to how to effectively remediate existing contamination. Choosing this alternative would defer any occupational exposure from well installation and surveying. However, the lack of surveys may ultimately lead to additional legacy sites that would present long-term remediation problems due to subsurface contamination.

Under the no-action alternative, occupational exposure would remain at the current level. If the proposed action is taken, occupational exposure may slightly increase as the time spent near contaminated areas would increase during sampling periods. But this benefit of the no-action alternative would be outweighed by the creation of additional legacy sites, which would require extensive regulatory oversight and large financial resources to remedy.

The no-action alternative is thus not the preferred option. Current practices could also allow a small number of licensees to become financially insolvent because of the increased cost of remediating previously unknown subsurface contamination. This subsurface contamination may not be detected under the present set of NRC regulations until the end of operations when the licensee begins preparing for decommissioning. These considerations were an important factor in the NRC's determination that the no-action alternative is not acceptable.

3.2 Alternative 3: Monitoring with Changes to Financial Assurance, and Collateral

This alternative would implement the changes set forth in Alternative 2 (the preferred alternative), with one additional requirement for a security interest in collateral to support the decommissioning assurance pledged in the parent company guarantee and self guarantee financial assurance mechanisms. As discussed in the introduction, changes to financial planning requirements have no direct impact on the environment and are not considered in this

environmental assessment. The additional monitoring, planning, and reporting requirements of Alternative 2 would also be implemented under Alternative 3. Therefore, for the purposes of this EA, the environmental impacts of Alternative 3 are identical to those of Alternative 2.

4.0 AGENCIES AND PERSONS CONSULTED

The NRC staff has determined that the final rule is not a type of activity that has potential to cause effects on historic properties because it is a procedural action. Therefore, no further consultation is required under Section 106 of the National Historic Preservation Act. Additionally, the NRC staff has determined that Section 7 consultation with the U.S. Fish and Wildlife Service is not required because the preferred Federal action is procedural in nature and will not affect listed species or critical habitat.

5.0 CONCLUSION

The NRC is amending its regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site. This document was prepared to consider and document the environmental impacts as part of the decision-making process. This assessment discusses the impacts of the rulemaking under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51. This rulemaking is not expected to have any significant environmental impacts, and therefore this rulemaking does not warrant the preparation of an environmental impact statement.

6.0 REFERENCES

1. Code of Federal Regulations, Title 10, Chapter I, Parts 2, 20, 30, 40, 50, 51, 70, and 72.
2. NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs, August 2003. (ML032450279)
3. NUREG-1496, Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities, Volume 1, July 1997. (ML0423104920)
4. Regulatory Analysis for Final Rulemaking - Decommissioning Planning, September 2008.