RULEMAKING ISSUE
(Notation Vote)

October 3, 2007 SECY-07-0177

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations /RA/

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

PURPOSE:

To request Commission approval to publish a proposed rule, in the *Federal Register*, for public comment. The proposed rule includes amendments to Title 10 of the *Code of Federal Regulations* (10 CFR) Parts 20, 30, 40, 50, 70, and 72.

SUMMARY:

In Staff Requirements Memorandum (SRM)-SECY-03-0069 dated November 17, 2003, the Commission approved the staff's recommendation to proceed with a proposed rulemaking that would amend regulations to reduce the likelihood that any current operating facility will become a legacy site. To help achieve this goal, two sets of amendments are proposed. The first set would: (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 defined term in 10 CFR Part 20 which includes subsurface contamination within its scope. 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 revised to include
subsurface contamination within their scope. Consistent with this approach, both provisions would contain the term "residual radioactivity," which serves to reinforce the intended linkage between these provisions.

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The second set of amendments would require more details in the contents of decommissioning funding plans and financial status reports, and would place tighter Nuclear Regulatory Commission (NRC) control over certain financial instruments used by licensees to provide decommissioning financial assurance. For example, licensees who use a parent guarantee or a self guarantee would be required to pay funds for decommissioning directly into a standby trust in the event the Commission determines that their financial condition requires immediate payment.

BACKGROUND:

In 1988, NRC issued regulations in 10 CFR Parts 30, 40, 50, 51, 70, and 72 (53 FR 24018; June 27, 1988) establishing criteria to decommission licensed facilities. In 1990, cleanup criteria based in part on residual radioactivity concentrations were proposed in a Site Decommissioning Management Plan (ML010100196). More effective and risk informed criteria based on calculated dose were proposed for public comment in 1994 (59 FR 43200; August 22, 1994) with the final rule issued in 1997 as Subpart E to 10 CFR Part 20 (62 FR 39058; July 21, 1997), known as the License Termination Rule (LTR).

Following the LTR, a small number of materials licensees were unable to comply with the criteria because their facilities, hereinafter called “legacy sites,” were in a decommissioning status and the licensees could not complete the decommissioning work for technical or financial reasons. For these and any other "legacy site" 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. SRM-02-0079 (October 21, 2002) addressed this issue and implemented a more aggressive regulatory program for a limited number of sites.

In SRM-01-0194 (June 18, 2002), the Commission directed the staff to further analyze LTR issues, one being the prevention of legacy sites. SECY-03-0069 (May 2, 2003) presented the staff’s analysis and recommendations. One recommendation was to implement a set of measures to prevent future legacy sites. The set of measures had two parts: (1) change licensee operations; and (2) change decommissioning financial assurance. SRM-SECY-03-0069 (November 17, 2003) approved the staff's plan, with comments, to prepare a proposed rule to implement these measures. The proposed rule would include a change to 10 CFR 20.1406 to extend to operating licensees the requirements promulgated with widespread agreement in the 1997 LTR that were applicable only to license applicants. SRM-04-0031 (June 14, 2004) approved the staff’s plan to proceed directly to the proposed rule stage. The NRC issued Regulatory Issue Summary 2004-08 (May 28, 2004) to all holders of operating licenses for power reactors, research and test reactors, and decommissioning sites to inform them of the proposed rule plan and its technical basis.

The proposed rule schedule was deferred in May 2006 to include in the technical basis relevant recommendations from the Liquid Radioactive Release Lessons Learned Task Force. The schedule was deferred again in January 2007, to allow time to include in the technical basis comments from power reactor, research and test reactor, and materials facility stakeholders received during a public roundtable meeting on January 10, 2007.

DISCUSSION:

Existing 10 CFR 20.1501 requires licensees to perform surveys as may be necessary to comply with Part 20 requirements, including surveys that are reasonable under the circumstances to evaluate potential radiological hazards. The staff's position is that these hazards include those resulting from subsurface contaminating events (e.g., slow but long-lasting leaks), when these events produce subsurface residual radioactivity that may pose a risk of creating a legacy site or that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402.

Facilities that process large quantities of material, especially in liquid form, have the potential for significant environmental contamination due to their scale of operations and their possession of dispersible sources. Leaks from these facilities can lead to long-lived radioactive contamination being released to the subsurface environment over an extended period of time; however, the estimated doses from these releases are below the effluent release limits in 10 CFR Part 20 that would initiate regulatory action.

Another factor is the high unit cost to dispose of radioactive material offsite. These costs are a concern even when the material contains relatively low concentrations of radioactivity. The cost of disposal may affect licensee business practices. For example, licensees may rely more on storing waste, perhaps in settling ponds, rather than in shipping waste to minimize onsite storage. A continued trend of high disposal costs could increase the number of environmental contamination incidents from pond releases, and could result in substantially higher decommissioning costs -- possibly exceeding financial resources.

Delayed identification of conditions also can be a factor causing future legacy sites. Past regulatory oversight of licensed sites where there was no potential for nuclear criticality has historically been limited. These facilities received NRC attention only after repeated problems were identified. This has allowed less serious, but, in some cases, long-term operational weaknesses to go unremarked. The result has been an accumulation of low-level releases of radioactive material to the subsurface environment. Because the radioactive materials combine with subsurface soil or ground water, these releases do not cause immediate exposure to either workers or the public that approach the limits specified in 10 CFR Part 20.

Enclosure 1 lists existing regulations which enable the staff to become aware of subsurface contamination. These regulations are not clear enough to specifically pertain to subsurface contamination, and need interpretation from estimated exposure to apply to long-term environmental conditions.

Reducing the occurrence of subsurface contamination is an objective of the proposed changes to §§ 20.1406 and 20.1501(a). Both a new § 20.1406(c) and an amended § 20.1501(a) would contain the term "residual radioactivity" to include subsurface contamination within their scope. Under the current § 20.1501, surveys rarely have been performed to assess the radiological hazard of chronic releases and subsurface contamination because the releases and contamination do not cause immediate exposure to either workers or the public that approach the limits specified in 10 CFR Part 20. Enclosure 2 summarizes the operating and financial assurance regulatory changes in the proposed rule. The Part 20 amendments require changes to operations. The financial assurance amendments would require more detailed reporting by

licensees and would place tighter NRC control over certain financial instruments used to provide decommissioning financial assurance. Enclosure 3 describes the amendments to place tighter control on financial instruments.
Enclosure 4 provides the draft *Federal Register* notice for the Decommissioning Planning proposed rule. Enclosure 5 provides the Regulatory Analysis (RA), including cost-benefit results and the reasons supporting a decision by NRC that the backfit requirements set forth in 10 CFR 50.109, 70.76, 72.62, and 76.76 do not require the preparation of a backfit analysis for this proposed rule. Enclosure 6 provides the Environmental Assessment which makes a determination of no significant environmental impact from the amendments in the proposed rule. Enclosure 7 provides the titles and ADAMS accession numbers for each of the SECY and SRM documents referenced in this SECY document.

A. Changes to Operations.

To address the problem of chronic releases, the staff recommended in attachment 8 of SECY-03-0069 that 10 CFR 20.1406 be revised to make it applicable to current licensees. The Commission approved this recommendation, stating in the SRM 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 survey every year.

The staff views its proposed revision to 10 CFR 20.1406 as an extension of the policy articulated by the Commission in 1997, when the LTR was established. The Statements of Consideration (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, 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; July 21, 1997).

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 as low as is reasonably achievable (ALARA). Licensees' operating procedures and controls need to include methods to evaluate potential radiological hazards and to minimize and control waste generation during facility operations and decommissioning, to achieve doses that are ALARA.

In furtherance of these existing requirements, the proposed § 20.1406(c) includes the term "residual radioactivity."[1] As stated in existing 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.

The proposed § 20.1406(c) would require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, particularly in the subsurface soil and ground water. The phrase "to the extent practical" is used in proposed 10 CFR 20.1406(c) to limit the scope of the regulation to actions that are already manifested in practice or action, which is appropriate for regulating licensee operations. 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. In contrast, the phrase "to the extent practicable" is used in §§ 20.1406(a) and (b) to mean actions that may not yet have a tested record of performance. Use of this phrase retains the wording formerly used in § 20.1406 when the regulation was applicable only to license applicants, and its retention in §§ 20.1406(a) and (b) is appropriate for staff review of design documents received from license applicants. The SOC, and draft regulatory guidance to be released with the proposed 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.

10 CFR 20.1501(a) is being revised by replacing its undefined term "radioactive material" with "residual radioactivity" which includes subsurface contamination within its scope and its use here is intended to provide a link with the proposed § 20.1406(c). The amended § 20.1501(a) would retain previous survey requirements and would specify that such requirements include consideration of subsurface residual radioactivity. Together, the amended §§ 20.1501(a) and 20.1406(c) would specify that compliance with 10 CFR Part 20 survey and recordkeeping requirements is a necessary part of effective planning for decommissioning. Draft regulatory guidance to be released with the proposed rule describes acceptable methods to implement the subsurface survey requirements, which are site-dependent based on facility operations. A new

1 The final part 52 rulemaking, in part, amended § 20.1406 by creating paragraphs (a) and (b); 72 FR 49352 dated August 28, 2007.

section 10 CFR 20.1501(b) is being added to require licensees to keep records of surveys of subsurface residual radioactivity with records important for decommissioning.

The phrase "are reasonable under the circumstances" is retained in existing § 20.1501(a), and is intended to provide flexibility to licensees to gauge the extent of their survey requirements by taking into consideration the nature of their facility operations. Section 20.1501 was added to the regulations in 1991 (56 FR 23360, May 21, 1995). In the SOC for that final rule, in a response to a comment about the lack of specificity in monitoring requirements, the Commission stated:

> 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;
> May 21, 1991)

The surveys performed by licensees to comply with § 20.1501 have been done primarily to comply with occupational and public dose limits. Those dose limits resulting from effluent release are contained in §§ 20.1301, 20.1302, and 50.36a, with reporting requirements in §§ 40.65, 50.36a(2), and 70.59. The amended §§ 20.1501(a) and 20.1406(c) will require that ground-water surveys, and possibly soil surveys, also be performed if there is a reason to believe that subsurface contamination is present that constitutes a potential radiological hazard.

It is important to distinguish between effluent release dose limits (§§ 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. In contrast, 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 a 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.

Licensees need to identify accurately, during operations, their onsite subsurface residual radioactivity. Spills of radioactive material can substantially increase decommissioning costs if not addressed in a timely manner. An example is Sequoyah Fuels, which did not have accurate and timely identification of its subsurface contamination during operations and, as a result, has

approximately 9 million cubic feet of contaminated soils with contaminated ground water instead of the approximate 3 million cubic feet with contaminated ground water estimated in 1996 in a report to the NRC to support its preferred approach for decommissioning. A second example is the Connecticut Yankee Nuclear Plant, where higher than planned decommissioning costs were due in part to larger volume of contaminated soil than was identified in the site characterization. The Commission is aware of other sites where subsurface contamination has increased decommissioning costs beyond the licensee's ability to pay (SECY-06-0226, November 17, 2006). The collection of onsite residual radioactivity information required of licensees through this proposed rule will improve decommissioning planning and will provide NRC a technical basis to require appropriate decommissioning financial assurance from materials licensees – based on surveys. Licensees would document these survey results in records important for decommissioning – for power reactors and research and test reactors this would be under 10 CFR 50.75(g), for independent spent fuel storage installations this would be under 10 CFR 72.30(d), and for materials licensees this would be under §§ 30.36(g), 40.36(f), and 70.25(g).

B. Changes to Decommissioning Financial Assurance.

Detailed Reporting. Current regulations require that each decommissioning funding plan must contain a decommissioning cost estimate (DCE), including the means to adjust the cost estimate periodically over the life of the facility. Since 1998, NRC staff has reviewed several hundred DCEs. Staff has identified recurring issues that arise in licensees' preparation of a DCE and has proposed regulatory amendments to require more detailed reporting in the contents of a DCE.

Detailed guidance on preparing the DCE is contained in NUREG-1757, Volume 3, but licensees are not required to follow the guidance. The proposed amendments to §§ 30.35(e), 40.36(d), Criterion 9(b) of Appendix A to Part 40, 70.25(e), and 72.30(b) would incorporate into regulations several DCE criteria that are now recommended in guidance, including that the DCE must specify the volume of soils and ground water containing residual radioactivity that will require remediation to meet the criteria for license termination. The amendments would specify that a DCE for Part 30, Part 40 (except for licensees subject to Appendix A to Part 40), Part 70, and Part 72 licensees must be based on the cost of meeting the unrestricted use criteria of § 20.1402, unless the licensee can demonstrate its ability to meet the restricted release provisions of § 20.1403.

Current regulations require that a power reactor licensee submit a post-shutdown decommissioning activities report (PSDAR) that includes a description of planned activities, along with a schedule for their accomplishment and an estimate of expected costs. The contents of the cost estimate are not specified. The proposed amendment to § 50.82(a)(4)(i) would require that the PSDAR cost estimate include estimates for decommissioning the facility and managing irradiated fuel until title to the fuel and possession of the fuel is transferred to the U.S. Secretary of Energy. The proposed amendment to § 50.82(a)(8)(v) would require the annual financial assurance status report to identify current amounts spent and estimated to be spent to complete decommissioning, and other material changes related to financial assurance.

Tighter Controls. The Decommissioning Planning proposed rule contains numerous amendments that have the common objective of providing greater certainty to the NRC that adequate financial assurance will be available at the start of decommissioning activities.

Enclosure 3 describes the proposed amendments for tighter controls of financial assurance. These include requiring a licensee to shift from a certification for financial assurance to a DCE if survey results detect significant residual radioactivity in soils or ground water, elimination of the escrow account as a method of providing financial assurance, monitoring by materials licensees of their fund balances, and changes to the parent guarantee and self guarantee mechanisms.

C. Stakeholder Participation and Affected Licensees

The NRC engaged stakeholders several times so that stakeholders would have a chance to provide input on the proposed rule. The stakeholder input was evaluated with other sources in the technical basis, including inspection reports and technical assessments, to structure a risk-informed approach in the amended regulations. In April 2005, the NRC conducted a two-day decommissioning workshop examining topics pertinent to the proposed rule technical basis. In January 2007, the NRC held a roundtable meeting to solicit input from stakeholders regarding subsurface residual radioactivity and decommissioning financial assurance requirements.

The proposed rule Working Group has met regularly since June 2006, and benefited from the participation via teleconference of a materials inspector from Region III and an Agreement State representative. NRC staff held discussions with State and Federal agencies on their experience with trust funds for long-term financial assurance, including the Environmental Protection Agency on October 6, 2006.

The proposed amendments are performance-based by allowing licensees to determine appropriate monitoring techniques based on site conditions. The RA finds that only a small number of materials licensees will need to perform additional ground-water surveys due to the presence of significant residual radioactivity. The licensees who will need to perform additional surveys were modeled in the RA as rare metal extraction facilities with uranium as a soil contaminant. Based on the RA, staff does not anticipate that other licensees, including power reactors, fuel cycle facilities, and the large majority of source and byproduct material facilities, will need to perform additional surveys under the proposed §§ 20.1406(c) and 20.1501(a). The RA estimates that 40-45 licensees will be affected by the tighter controls and additional reporting requirements in changes to the parent guarantee and self guarantee regulations, and that a few (2-3) power reactor licensees will be affected by the additional annual reporting requirements under changes to 10 CFR 50.82. Elimination of the escrow account will have a one-time affect on about 20 licensees who will need to switch to another form of financial assurance.

D. Outcome of this Proposed Rule: Advancing NRC's Strategic Goals.

The proposed rule is consistent with NRC's strategic objective and performance goals. The proposed rule would continue the safety goal efforts to ensure protection of the public health and safety and the environment; it would enhance environmental protection by improving licensee decommissioning planning activities, while the facility is in an operating mode, thereby reducing the likelihood of additional legacy sites and the high costs of enforcement and remediation. NRC environmental protection oversight would be improved by increased recordkeeping of site contamination which serves as the basis for licensees' decommissioning cost estimates. The proposed rule would help to ensure that NRC actions are effective, efficient, realistic, and timely. Placing these provisions in regulations, rather than in regulatory guidance, would improve regulatory efficiency in a number of financial assurance topical areas. The proposed rule will be published in the *Federal Register* for a 75-day public comment

period. The staff will publish an article on the proposed rule in the next issue of the Office of Federal and State Materials and Environmental Management Programs (FSME) Quarterly Newsletter.

E. Agreement State Issues.

The staff analyzed the proposed rule using the procedures established in Management Directive 5.9, "Categorization Process for NRC Program Elements," and has determined that sections of the proposed rule are classified in Compatibility Categories "NRC", "H&S", "C", and "D". Section V of the proposed rule addresses the topic of Agreement State Compatibility.

The draft *Federal Register* notice of the proposed rule was provided to Agreement States through FSME-07-063, dated July 12, 2007, which informed States that the proposed rule was on the Technical Conference website for States' early and substantive comment. No comments were received on the proposed rule as of September 6, 2007.

COMMITMENT:

Staff commits to develop draft regulatory guidance to: (1) implement proposed subsurface monitoring requirements, and (2) implement proposed amendments to financial assurance.

RECOMMENDATIONS:

That the Commission:

1. Approve for publication, in the *Federal Register*, the proposed amendments to 10 CFR Parts 20, 30, 40, 50, 70, and 72 (Enclosure 4).

2. Note:

   a. That the proposed amendments will be published in the *Federal Register*, allowing 75 days for public comment.

   b. That a draft regulatory analysis has been prepared (Enclosure 5).

   c. That a draft environmental assessment and finding of no significant impact has been prepared (Enclosure 6).

   d. That the Chief Counsel for Advocacy of the Small Business Administration will be informed of the certification regarding the economic impact on small entities and the reasons for the certification as required by the Regulatory Flexibility Act, 5 U.S.C. 605(b).

   e. That appropriate Congressional committees will be informed of this action.

   f. That a press release will be issued by the Office of Public Affairs when the proposed rulemaking is filed with the Office of the Federal Register.

g. Office of Management and Budget (OMB) review is required and a clearance package will be forwarded to OMB no later than the date the proposed rule is submitted to the Office of the Federal Register, for publication.

h. NUREG-1757, Vol. 3, is being revised to provide guidance for proposed amendments to financial assurance requirements, and a new guidance document is being written to implement 10 CFR 20.1501(a) monitoring requirements. These two documents will be published for public comment at approximately the same time as the proposed rule is published.

RESOURCES:

To complete the rulemaking, 0.5 full-time equivalent (FTE) positions in fiscal year (FY) 2008 will be required. These resources are included in the FY 2008 budget request.

COORDINATION:

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

/RA William F. Kane for/

Luis A. Reyes
Executive Director
for Operations

Enclosures:
1. Existing Regulations
2. List of Proposed Amendments
3. Amendments for Financial Assurance
4. *Federal Register* Notice
5. Draft Regulatory Analysis
6. Draft Environmental Assessment
7. SECY and SRM Documents

Existing Regulations That Staff Could Use to Identify Subsurface Contamination

The following regulations provide the staff with the capability to become aware of subsurface contamination. These regulations, however, do not specifically pertain to subsurface contamination at the site, and need interpretation from the current focus on estimated exposure to apply to long-term environmental conditions.

10 CFR	Relevance to identification of subsurface contamination
Part 19	Specifies notices and inspections, but is focused primarily on events related to short-term worker exposures.
Part 20	Provides requirements for protection of the public and workers from excessive exposure to radiation. The emphasis is on preventing and mitigating events that could result in imminent exposures, not projected long-term exposures. Including exposures from existing licensed sites and focusing on long-term conditions require rulemaking, because § 20.1406 presently requires only that license applicants must design their facilities and prepare operating procedures to minimize contamination and radioactive waste. While Part 20 supports a vigorous enforcement program, its current focus is on events resulting in actual or potential immediate exposures.
Part 21	Provides requirements focused on component failures, rather than the dose effects of the failures. The "substantial safety hazard" specified in § 21.21 is generally interpreted to address events resulting in short-term worker exposure, rather than long-term environmental hazards, such as ground-water contamination.
Parts 30, 40, 70 and 72	Section 30.35 (and equivalent sections 40.36, 70.25, and 72.30) specifies that upon application, certain licensees must have a decommissioning funding plan based on current estimates of total decommissioning costs, and financial assurance to support it. Section 30.36 (and equivalent sections 40.42, 70.38, and 72.54) specifies that the decommissioning plan must be an accurate statement of the radiological condition of the site. Assessment of the radiological condition of the site, however, only occurs at the end of licensed operations. There are no requirements for licensees to report periodically the radiological condition of the site, especially any subsurface contamination, in conjunction with updating cost estimates for decommissioning funding and financial assurance.
Part 40	Section 40.32 specifies that for certain facilities or "... any other activity which the Commission determines will significantly affect the quality of the environment," the staff must evaluate environmental benefits and costs prior to issuance of the proposed license, "with any appropriate conditions to protect environmental values." Environmental reviews that include potential subsurface and ground-water contamination are currently not explicitly required.
Parts 40, 50 and 70	Section 50.36a(2) specifies that “Each licensee shall submit a report to the Commission annually that specifies the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous 12 months…” Sections 40.65(a)(1) and 70.59 have similar reporting requirements except on a semi-annual basis.

List of Amendments and Revised Section of Regulatory Text

The table below lists the topical area of amendments in the Decommissioning Planning proposed rule organized by changes to 10 CFR part 20, Changes to Operations, and changes to financial assurance regulations in 10 CFR parts 30, 40, 50, 70 and 72.

Changes to Operations	New or revised section of text (10 CFR part)
• Conduct operations to minimize residual radioactivity, including in the subsurface	20.1406(c)
• Perform surveys of residual radioactivity and retain records in records important for decommissioning	20.1501(a) and (b)
Changes to Financial Assurance	
Detailed Reporting	
• Additional details in the decommissioning cost estimate	30.35(e), 40.36(d), 70.25(e)(1), and 40 Appendix A Criterion 9(b)
• Additional details in the PSDAR	50.82(a)(4)(i)
• Additional details in the annual financial assurance status report	50.82(a)(8)(v)
Tighter Controls	
• Certified amount as decommissioning financial assurance not allowed if significant residual radioactivity is detected	30.35(c)(6), 40.36(c)(5), and 70.25(c)(5)
• Eliminate escrow account as approved financial assurance mechanism	30.35(f), 40.36(e), 70.25(f), and 72.30(e)
• Protect decommissioning assurance funds from financial market fluctuations	30.35(i), 40.36(h), 70.25(i), and 72.30(g)
• Trust fund required for decommissioning under restricted conditions or alternate release criteria	20.1403(c) and 20.1404(a)(5)
• Required financial assurance information of transferee prior to license transfer	30.34(b), 40.46, 70.36, and 72.50(b)(3)
• Required information in the financial assurance instrument	30.35(f), 40.36(e), 70.25(f), and 72.30(e)
• Parent Guarantee changes	30 Appendix A
• Self Guarantee changes	30 Appendices C, D and E

Proposed Amendments to Provide Tighter Controls on Decommissioning Financial Assurance

Current Regulations	**Amendments Providing Tighter Control of Adequate Funds**
Current regulations allow materials 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 in amounts specified by regulation, rather than having to prepare a detailed DCE and submit proof of financial assurance in the amount of the estimate. Remediating subsurface contamination can be expensive. Licensees with certified amounts have no requirement to increase the amount of decommissioning financial assurance to cover subsurface remediation costs.	Proposed amendments to §§ 30.35(c)(6), 40.36(c)(5) and 70.25(c)(5) would require licensees using a certification to shift to a DCE if survey results detect significant residual radioactivity in soils or ground water. These proposed amendments also provide the regulatory basis to require such licensees to cover the full cost of decommissioning, not just the prescribed amount covered by a certification.
Current regulations allow the use of an escrow account as a financial assurance mechanism. Staff considers an escrow account as less preferable than a trust for assurance that funds will be available when needed for decommissioning. 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, while in an escrow account, title to the property remains with the grantor. (46 FR 2802, 2827) Escrow property is more likely to be subject to a creditor's claim than property held in trust.	Proposed amendments to §§ 30.35(f), 40.36(e), 70.25(f), and 72.30(e) would eliminate the escrow account as a method to provide financial assurance. About 25 licensees with escrow accounts will be affected by this proposed change.
Current regulations allow lines of credit as financial assurance mechanisms, but no licensee to date has used this method to provide decommissioning financial assurance. Maintaining the option to use a line of credit incurs costs to maintain regulatory guidance and conduct training. The cost is small, but it appears no benefit is realized from retaining this option in the regulations.	Proposed amendments to §§ 30.35(f), 40.36(e), 70.25(f), and 72.30(e) would eliminate the line of credit as a method to provide financial assurance.
Current regulations allow funds set aside for decommissioning to be placed in accounts that are subject to market fluctuations. But there is no requirement for the licensee to monitor the fund balance and replace shortfalls that can occur when market prices decline.	Proposed amendments to §§ 30.35(i), 40.36(h), 70.25(i), and 72.30(g) would require licensees to monitor the fund balance and specifies a time period for licensees 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.

Current regulations allow licensees to use several financial assurance mechanisms to provide decommissioning financial assurance for restricted site release, but specify 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 best suited for a long-term financial assurance instrument because it can exist for long periods of time without need for renewal.	Proposed amendments to §§ 20.1403(c) and § 20.1404(a)(5) would require licensees to place adequate funds into a trust for the purpose of long-term control and maintenance, and would eliminate sureties, insurance, other guarantee methods, and other forms of prepayment for restricted site release cases. Government entities would continue to be permitted to use a statement of intent or to assume custody and ownership of a site.
Current regulations do not specify required information about the transferee as part of the request for license transfer.	The proposed changes to §§ 30.34(b), 40.46, 70.36, and 72.50(b)(3) would codify 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
Current regulations specify a limited amount of 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 proposed amendments to §§ 30.35(f), 40.36(e), 70.25(f), and 72.30(e) would require that the name and contact information for each party is included in the instrument, and that the instrument include the license and docket numbers of the facility for which it provides financial assurance. The licensee would be required to submit a revised instrument within 30 days of a change in the information on the current instrument.
Current regulations in the parent guarantee and self guarantee specify a minimum tangible net worth requirement of $10 million, which was adopted in the 1988 final rule (53 FR 24018)	Proposed amendments in Appendices A, C, D, and E of 10 CFR part 30 would change this figure to $19 million to account for inflationary increase in the value of the dollar.
Appendices A and C of 10 CFR part 30 do not specify that the rated bond must be uninsured, uncollateralized, and unencumbered to reflect a bond rating agency's evaluation of the financial stability of the bond issuer.	Proposed amendments in Appendices A and C of 10 CFR part 30 will add the requirement that the bond rating used to pass the financial test must be uninsured, uncollateralized, and unencumbered.
Current regulations in the parent guarantee and self guarantee specify the bond ratings required to pass the financial test.	Proposed amendments in Appendices A, C, D, and E of 10 CFR part 30 will clarify that qualifiers at the low end of the bond ratings, for example "-" and "3", meet the regulatory standard. The amendments also will require an annual verification of the bond rating.

Current regulations in the parent guarantee and self guarantee do not require the independent certified public accountant's special report to examine off-balance sheet transactions. These transactions have the potential to materially affect the guarantor's ability to fund decommissioning obligations.	Proposed amendments in Appendices A, C, D, and E of 10 CFR part 30 would require the auditor to include an opinion of off-balance sheet transactions.
Current regulations in the parent guarantee and self guarantee require the licensee to repeat passage of the financial test each year, but do not explicitly state that the licensee must annually submit documentation to the NRC to verify its passage of the test	Proposed amendments in Appendices A, C, D, and E of 10 CFR part 30 would require annual submittal of documentation that the guarantor passed the financial test.
Current regulations in the parent guarantee and self guarantee do 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 funding for decommissioning until after the NRC has required payment.	Proposed amendments in Appendices A, C, D, and E of 10 CFR part 30 would require the guarantor to set up a standby trust before the guarantee becomes effective, would provide the Commission with the right to change the trustee, and would specify that an acceptable trust is one that meets the regulatory requirements of the Commission.
Current regulations in the parent guarantee and self guarantee do not specify the guarantor's obligation to fund decommissioning work to terminate the license.	Proposed amendments in Appendices A, C, D, and E of 10 CFR part 30 would clarify 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.
Current regulations do not require the parent company to comply with Commission orders.	Proposed amendments in Appendix A of 10 CFR part 30 would clarify the parent company guarantee to include 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.
Current regulations in the parent guarantee and self guarantee do not provide for the possibility that the guarantor may be in financial distress at the time it is required to provide alternate financial assurance	Proposed amendments in Appendices A, C, D, and E of 10 CFR part 30 would authorize the Commission to make the amount guaranteed immediately due and payable to the standby trust, 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.

[7590-01-P]

NUCLEAR REGULATORY COMMISSION

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

RIN: 3150-AH45

Decommissioning Planning

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is proposing to amend its regulations to improve decommissioning planning, and thereby reduce the likelihood that any current operating facility will become a legacy site. The amended regulations would require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, including subsurface soil and groundwater. Licensees also would be required to survey certain quantities or concentrations of residual radioactivity, 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 would require licensees to report additional details in their decommissioning cost estimates, would eliminate two currently approved financial assurance mechanisms, and would 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 would require decommissioning power reactor licensees to report additional information on the costs of decommissioning and spent fuel management.

DATES: Submit comments on the proposed rule by **[insert 75 days from date of publication].** Submit comments specific to the information collections aspects of this rule by **[insert 30 days from date of publication]**. Comments received after these dates will be considered if it is practical to do so, but assurance of consideration cannot be given to comments received after these dates.

ADDRESSES: You may submit comments by any one of the following methods. Please include the following number RIN 3150-AH45 in the subject line of your comments. Comments on rulemakings or petitions submitted in writing or electronic form will be made available to the public in their entirety on the NRC rulemaking web site. Personal information, such as your name, address, telephone number, e-mail address, etc., will not be removed from your submission.

Mail comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.

E-mail comments to: SECY@nrc.gov. If you do not receive a reply e-mail confirming that we have received your comments, contact us directly at 301-415-1966. You may also submit comments via the NRC's rulemaking web site at http://ruleforum.llnl.gov. Address questions about our rulemaking web site to Carol Gallagher 301-415-5905; e-mail cag@nrc.gov. Comments can also be submitted via the Federal eRulemaking Portal http://www.regulations.gov.

Hand deliver comments to: 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 am and 4:15 pm Federal workdays. (Telephone 301-415-1966).

Fax comments to: Secretary, U.S. Nuclear Regulatory Commission at 301-415-1101.

Publicly available documents related to this rulemaking or petition may be viewed electronically on the public computers located at the NRC's Public Document Room (PDR),

O1 F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The PDR reproduction contractor will copy documents for a fee. Selected documents, including comments, may be viewed and downloaded electronically via the NRC rulemaking web site at http://ruleforum.llnl.gov.

Publicly available documents created or received at the NRC after November 1, 1999, are available electronically at the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/adams.html.http://www.nrc.gov/reading-rm/adams.html. From this site, 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 PDR Reference staff at 1-800-397-4209, 301-415-4737 or by e-mail to pdr@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 kro2@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Background

In 1988, NRC issued regulations in Title 10 Code of Federal Regulations (10 CFR) Parts 30, 40, 50, 51, 70, and 72 establishing new financial criteria applicable to decommissioning licensed nuclear facilities (53 FR 24018; June 27, 1988). Planning, estimating costs, acceptable funding methods, and environmental review provisions were among the requirements established in 1988, and were designed to ensure that licensee funds would be available when needed to complete safe and timely decommissioning of all licensed facilities. Financial assurance regulations are part of NRC's overall strategy to maintain public health and safety, and protection of the environment, during and after nuclear facility decommissioning. The NRC announced in 1988 that it intended to periodically assess the effectiveness of the funding methods permitted in the regulations. Since then, the NRC has issued several amendments to the financial criteria applied to decommissioning licensed nuclear facilities.

After NRC published financial assurance regulations in 1988, a small number of sites were unable to fully comply with the financial assurance requirements. In some cases, these sites had large amounts of onsite residual contamination, remediation of which would exceed available funds. The Commission directed the staff, in Staff Requirements Memoranda (SRMs) dated August 22, 1989, and January 31, 1990, to develop a strategy for resolving decommissioning issues and to develop a prioritized list of contaminated sites. In response, the Site Decommissioning Management Plan (SDMP) was developed, containing cleanup criteria based in part on residual radioactivity concentrations for sites with extensive uranium and thorium contamination.

In 1993 (58 FR 68726), licensees that passed financial test criteria were allowed to use a self-guarantee to provide financial assurance for decommissioning. In 1996 (61 FR 39299;

July 29, 1996), nuclear power reactor decommissioning procedures were clarified, while recognizing that the radioactivity resulting from contaminated materials and effluents (air and water) must be minimized and controlled. In 1998 (63 FR 29535; June 1, 1998), use of the self-guarantee method was broadened to include some commercial licensees who do not issue bonds, as well as non-profit licensees, such as colleges, universities and hospitals. Also in 1998 (63 FR 50465; September 22, 1998), NRC amended power reactor decommissioning financial assurance requirements in response to potential deregulation of the power generating industry. In 2003 (68 FR 57327; October 3, 2003), the set of materials licensees for which financial assurance is required was expanded to include all waste brokers. Additionally, large irradiators were required to prepare a site-specific decommissioning cost estimate as the basis of their financial assurance; decommissioning certification amounts were increased by 50 percent; and decommissioning cost estimates were required to be updated for certain licensees at least every three years.

Apart from these changes in financial assurance requirements summarized above, more comprehensive and risk informed decommissioning regulations were issued 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 *Federal Register* notice publishing the 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 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 as low as reasonably achievable (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 SRM-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 document). 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 summarized above, and authorized this proposed rulemaking. As pertinent to the 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 proposed 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 calls for publication of this 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 presenting 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.

II. Discussion

A. What Action is the NRC Taking?

The NRC is proposing changes to 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 complimentary amendments have been proposed that would 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 10 CFR 20.1406(c) and 20.1501(a) are being 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 proposed changes to improve decommissioning planning addresses decommissioning financial assurance requirements.

The proposed 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 and radiological criteria for license termination in Subpart E of this part.

The proposed revised 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 in a timely manner-

(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 above proposed requirements, and this term is discussed below.

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 above, the new 10 CFR 20.1406(c) would require that licensees conduct their operations in a manner that will minimize the introduction of residual radioactivity into the site.

Section 20.1501(a) would be 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 the current rule language as well as other radioactive material resulting from activities under the licensee's control, such as radioactive material 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) would retain previous survey requirements, but would add that such requirements include consideration of waste in the form of residual radioactivity. Together, the amended §§ 20.1501(a) and 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 document. These activities, undertaken during facility operations, would provide a technical basis for licensees and 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 to the site by licensee activities.

The new paragraph 10 CFR 20.1501(b) would be revised to require 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. 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.

During decommissioning, the licensee must evaluate dose from 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, unless such contamination is an extension of onsite contamination (e.g., a contaminated ground water plume originating from the licensee’s facility).

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 decommissioning cost estimate. Additional discussion on this topic is in Sections II.G and II.H of this document.

NRC considers proposed changes to 10 CFR 20.1406 and 20.1501 to be 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.

The proposed rule (amending §§ 30.35, 40.36, 70.25, and 72.30, and Criterion 9 of appendix A to part 40) would codify certain aspects of existing regulatory guidance to improve the quality of Decommissioning Funding Plans (DFP), and would apply NRC experience to increase the likelihood that adequate funds will be available when needed to complete the decommissioning process. The proposed rule amendments would allow 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. The proposed rule would address 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. Each of the licensees who use the guarantee mechanism would be required to establish a standby trust fund to receive the guaranteed financial assurance amount should that amount become immediately due and payable. Decommissioning fund status reporting requirements would be amended for materials licensees. Licensees with reactors in a decommissioning status would have additional reporting requirements for decommissioning fund status, spent fuel management, and final cost of decommissioning. A trust fund would be the only mechanism allowed for the long term maintenance and surveillance of a site using the

10 CFR 20.1403 restricted release criteria, unless a government organization either provides a guarantee of funds or assumes custody and ownership of the site. This topic is discussed further in Sections II.M, N and O of this document.

B. Who Would This Action Affect?

Based on the Regulatory Analysis for this proposed rule, NRC estimates that a small number of materials licensees (a total of about 5 NRC and Agreement State licensees) would 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 extraction facilities with uranium as a soil contaminant. Although the number of licensees affected by the proposed rule 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.

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. The routine monitoring plan is described in draft regulatory guidance released concurrently with this proposed 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 decommissioning cost estimates.

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 would not be affected by this proposed rule. Draft regulatory guidance released concurrently with this proposed rule describes an acceptable method for these licensees to confirm the absence of subsurface residual radioactivity at their facilities.

Approximately 300 NRC materials licensees and over 1,000 Agreement State licensees have an obligation to set aside funds for decommissioning financial assurance. Of these, 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 changes in §§ 30.35, 40.36, 70.25, and 72.30 would require a licensee to switch out of its certified funding amount, and replace the certified amount with a DFP. In preparing this proposed rule, NRC staff was not aware of any licensees using certified amounts for decommissioning that would 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 would have additional reporting requirements based on changes in §§ 30.35, 40.36, 50.82, 70.25, and 72.30. The materials licensees under 10 CFR part 30, 40, 70, and 72 would need to provide more details to support their decommissioning cost estimate, such as the assumed cost of an independent contractor to perform all decommissioning activities. The power reactor licensees under 10 CFR part 50 would need to provide more details to support their decommissioning schedule, cost estimates for managing irradiated fuel, and financial assurance status report.

Approximately 20 licensees who use an escrow account as a prepayment financial mechanism would be affected by proposed changes in §§ 30.35, 40.36, 70.25, and 72.30

(which would eliminate the escrow account as a prepayment financial assurance method). No licensees are using a line of credit as a financial mechanism; both the escrow account and the line of credit are proposed for elimination as acceptable financial assurance instruments.

Approximately 45 NRC licensees use a parent company guarantee or self-guarantee as a financial assurance mechanism. These licensees may be affected by proposed changes in 10 CFR part 30, appendices A, C, D, and E, which would require establishment of a standby trust fund before the guarantee becomes effective. The standby trust fund would 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 has assumed that a total of 25 of these licensees would need to establish a trust fund to comply with the amended regulations with the other 20 already having an established trust fund.

The licensees of 12 decommissioning reactors who have submitted a certification of permanent cessation of operations under 10 CFR 50.82(a), would be affected by proposed changes in reporting requirements regarding decommissioning fund status, the spent fuel management plan, and final costs of decommissioning. These proposed reporting requirements are set forth in § 50.82(a)(8)(v) and (vi) to clarify that the fund status reports for decommissioning reactors differ from the reports for operating reactors under § 50.75.

The Regulatory Analysis for this proposed rule, referenced in Section X of this document, has detailed cost-benefit estimates regarding the licensees who would be affected by the 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 two-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 included in this proposed rule. Since then, NRC has maintained a series of web pages with information (http://www.nrc.gov/about-nrc/regulatory/decommissioning.html) including draft guidance documents, Commission papers, and a variety of decommissioning program documents. NRC presented papers on the scope of this proposed 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 70 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 proposed changes to 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 Has NRC Considered?

The rulemaking Working Group considered different alternatives for the proposed rule and agreed on the following for analysis in the Environmental Assessment (see Section VIII of this document) and the Regulatory Analysis (see Section XI of this document):

Alternative 1: No Action.

This alternative provides a baseline to assess the other two alternatives. It assumes that if no changes are made to the regulations, there will be additional legacy sites from currently operating facilities licensed by NRC and Agreement States.

Alternative 2: Monitoring with proposed changes to financial assurance.

This alternative would implement the proposed changes in 10 CFR 20.1406(c) and 20.1501, and the proposed changes to decommissioning planning and financial assurance requirements.

Alternative 3: Monitoring with proposed changes to financial assurance, and collateral.

This alternative would implement the proposed changes in Alternative 2, and 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.

NRC considered two other alternatives, beyond the three noted previously, but did not analyze them in as much detail. One alternative was to require that materials licensees obtain accidental property damage insurance to cover the reasonable costs of decontaminating its facility and site and disposing of contaminated materials in the event of a large, sudden and accidental onsite release of radioactive material. This was prompted, in part, by the objective to apply consistent financial assurance standards to reactors and materials facilities. The NRC requires reactor licensees, under 10 CFR 50.54(w), to obtain insurance to pay for cleaning up

an accidental release of radioactive material that causes a present danger of release offsite that would pose a threat to public health and safety. NRC staff evaluated whether it would be appropriate to require onsite property damage insurance for materials facilities to pay costs associated with cleaning up a sudden and accidental event that could, if the operators needed to shut down the facility, overwhelm the decommissioning fund. This issue has been addressed before. On June 7, 1985 (50 FR 23960), the NRC published an advanced notice of proposed rulemaking requesting comments on requiring financial assurance for the cleanup of accidental or unexpected contamination, both onsite or offsite. After several technical studies were conducted, the NRC concluded in 1995 that no such rulemaking was necessary. The NRC has revisited this issue and has found that there have been no significant changes affecting the 1995 conclusion. Accidents at materials facilities that require expensive cleanup continue to be rare, with annual costs of cleanup small. The reportable radioactive material spills and releases from materials facilities over the 15-year period since 1991, as documented in the Nuclear Materials Events Database, have been about 2 events per year. Those events were primarily one-time small spills caused by mechanical failure of a valve, pump or pipe or in a few cases from human error. In the early 1990s there were several reportable events of contaminated drain lines or leakage from a storage pond, but these types of low-level chronic contaminating events have not been reported at facilities since then.

NRC determined that materials licensees are not able to obtain, at reasonable cost, environmental impairment liability insurance, including nuclear contamination events from both sudden and gradual accidental releases. American Nuclear Insurers (ANI), an agent for multiple insurance companies, provides non-reactor nuclear liability policies that provide coverage for third party claims made to cover off-site liability damages. The policies do not cover onsite damages nor do the policies cover the cost of environmental cleanup that would exceed the actual damages to the third party. NRC had determined that non-reactor property

insurance is available, but this insurance would exclude "gradual contamination" and cover only damages caused by a "sudden and accidental" event. Because the events occur only rarely and on a small scale, NRC has decided not to propose amendments to require materials licensees to obtain environmental cleanup insurance.

The occurrence of "gradual contamination," such as leakage outside the licensee's buildings, is intended to be addressed by the proposed changes to §§ 20.1406(c) and 20.1501. Funding to remediate the leakage would be addressed by changes in the requirements for reporting decommissioning fund status and decommissioning cost estimates.

Another alternative considered by NRC is the use of licensee incentives to facilitate decommissioning planning and reduce the likelihood of future legacy sites. In Section II.V of this document, NRC seeks public comments on this topic. The Advisory Committee on Nuclear Waste (ACNW) recommended, in a December 27, 2006, letter to Chairman Klein, that NRC staff should consider offering financial incentives to certain licensees to encourage their use of integrated monitoring and modeling approaches to demonstrate compliance with regulations and to apply site characterization data in a conceptual site model maintained during the facility lifetime. The regulations in 10 CFR 171.11(b) allow the Commission to grant an exemption in a licensee fee that it determines is authorized by law or otherwise in the public interest. NRC staff is not aware of any time the Commission has used a 10 CFR part 171 annual fee exemption for this purpose. NRC staff was aware of 10 CFR part 170 fee exemptions, or fee waivers, for plants to "pilot" a new license amendment process. In practice, fee waivers are given very sparingly and only with convincing evidence that there is a public benefit to the waiver. The cost of a fee waiver would have to be paid through annual fees from other NRC licensees.

E. What is a Legacy Site?

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. These sites have been materials facilities, not reactor facilities.

The purpose of this proposed rulemaking 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. Residual radioactivity at the complex decommissioning sites is primarily from the following radionuclides: U-235, U-238, Th-232, Ra-226, Cs-137, Am-241, Sr-90, and H-3. Public or occupational exposure to these radionuclides may be a radiological hazard.

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 are 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). The proposed rule would eliminate all prepayment mechanisms except the trust fund, for reasons discussed under Section II.N.2 of this document.

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). The proposed rule would eliminate the line of credit as an acceptable mechanism, for reasons discussed under Section II.N.10 of this document.

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 decommissioning cost estimate, 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. The proposed rule amendments would make 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.

The previous discussion was for financial assurance to decommission a site for 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, the NRC proposes to amend 10 CFR 30.35, 40.36, 70.25, and 72.30 to require licensees to obtain NRC approval of their DFP based on a decommissioning cost estimate 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, address the problem in a timely manner, and update its decommissioning cost estimate based on new conditions, the licensee may find it

difficult to later meet its decommissioning obligations. To address this problem, the NRC proposes to amend 10 CFR 20.1406 as discussed in Section II.A above. Licensees also would be required, in proposed amendments to 10 CFR 30.35, 40.36, 70.25, and 72.30, to factor in residual radioactivity information in arriving at decommissioning cost estimates.

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, the NRC proposes to amend 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, the NRC proposes to amend 10 CFR 30.35(h), 40.36(f), 70.25(h), and 72.30(g) to require that licensees 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, the NRC proposes to amend 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 decommissioning cost estimate. 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. Additional oversight is necessary to

assure that the licensee anticipates potential shortfalls and takes steps to control costs to stay within its budget or obtain additional funds. The NRC, therefore, proposes to amend 10 CFR 50.82 to require nuclear power reactor licensees, whose reactor is in a decommissioning status, to report to the NRC (1) The actual cost of decommissioning to date; (2) An assessment of the cost to complete the work; and (3) The amount of financial assurance available and the plan to obtain additional financial assurance to cover the cost to complete the work, if necessary. The report would be made annually to provide cost data to evaluate whether changes are needed in the minimum amount of required financial assurance and to assure that adequate resources will be available when needed to complete the decommissioning activity.

I. What Changes are Being Proposed 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 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. Draft regulatory guidance released with this proposed rule specifies 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 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 current 10 CFR 20.1101 requirements are related to those in proposed 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, the new 10 CFR 20.1406(c) includes the term "residual radioactivity," as discussed previously in Section II.A. This new section would apply 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. 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).

The proposed 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 current regulations, residual radioactivity that enters the ground at a site may go undetected because there are generally no NRC requirements to monitor the ground water onsite for contamination. 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 decommissioning cost estimate. 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 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 (less than 1 MWt). The draft regulatory guidance released concurrently with this proposed rule describes an acceptable method for these licensees to confirm the absence of subsurface contamination at their facility.

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 at http://www.reirs.com/effluent/. Several

nuclear power plants recently 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, planned for implementation 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 Proposed Changes to 10 CFR 20.1501(a)?

Existing § 20.1501(a) requires 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 liquid 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 period of 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 has considered in this rulemaking 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 substantially higher decommissioning costs. A third factor that could cause 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 extent of contamination has become apparent.

As discussed previously in Section II.A, in accordance with proposed changes to 10 CFR 20.1501(a), licensees would be required to perform contamination surveys to comply with current 10 CFR part 20 requirements, and the new § 20.1406(c). 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) would retain previous survey requirements and would specify 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 wells. Draft regulatory guidance released concurrently with the proposed 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 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.

Other proposed amendments (revised 10 CFR 30.35(e)(2), 40.36(d)(2), 70.25(e)(2), and 72.30(c)) would 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 new requirement would apply only to licensees who are required to have a DFP, and would assure that these licensees properly consider the extent of subsurface residual radioactivity in their decommissioning cost estimates, 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 would be required to submit a decommissioning cost estimate.

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 proposed § 20.1501(a) would be of a simple form, as discussed in draft regulatory guidance released with this proposed rule. 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.

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 likely would contain sufficient information to satisfy the proposed §§ 20.1406(c) and 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 would need to install additional monitoring equipment or modify existing operating procedures to satisfy the proposed 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 would 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 the proposed §§ 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 Proposed Changes to 10 CFR 20.1501?

NRC is proposing, 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 would 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 would 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 proposed paragraph 10 CFR 20.1406(c).

For 10 CFR 20.1501(b), licensees would 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). These records can be as simple as a description of the 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. The intent of 10 CFR 20.1501(b) recordkeeping is to address onsite subsurface residual radioactivity that would later require remediation during decommissioning to meet the unrestricted use criteria of 10 CFR 20.1402.

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

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

Instead, NRC would require licensees to collect information and to have that information available for review. The information would need to 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 changes proposed 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 would increase under § 50.82(a) for power reactor licensees who prepare a post-shutdown decommissioning activities report (PSDAR) or an annual financial assurance status report.

Under changes proposed 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 proposed 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 would have increased reporting requirements in proposed changes to report off-balance sheet transactions and annual documentation of continuing eligibility to use the self-guarantee.

Licensees would continue to submit information to the NRC by certified mail or through approved Electronic Information Exchange (EIE) methods. NRC requests comments regarding licensee reporting using a secure website accessible by licensees from the NRC public website. This would include submittal and updating of the DFP, decommissioning cost estimates, information in the financial tests for the parent company guarantee and self-guarantees, decommissioning power reactor annual financial assurance status report, and other information for which licensees believe the use of a secure website would reduce their labor hours in responding to reporting requirements. Section IX of this document, Paperwork Reduction Act Statement, provides an estimate of the hours needed annually for licensees to complete the reporting requirements for each part with amended regulations.

M. What Financial Assurance Information Must Licensees Currently 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 the licensees under 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 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.

Except for part 72 licensees, materials licensees must also provide the original of the financial instrument obtained to satisfy the financial assurance requirement.

For materials licensees, Chapter 4 in NUREG-1757, Volume 3, "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/.

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.

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 are the Proposed Changes to the Financial Assurance Regulations?

Most of the proposed amendments are changes to financial assurance regulations for materials licensees. A few changes apply to decommissioning financial assurance for power reactor licensees. The proposed 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 proposed changes are currently in NRC guidance and are being codified in this proposed rule. The proposed 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 proposed changes increase licensee reporting requirements. The added reporting burden is estimated as part of the Paperwork Reduction Act Statement (Section IX of this document). The costs and benefits of other aspects of these proposed amendments are evaluated in the Regulatory Analysis in Section X of this document.

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

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

The proposed rule would require, 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. Section 20.1403(c)(1) currently contains a cross reference to § 30.35(f)(1) that allows use of any of the financial instruments listed in § 30.35(f)(1) for providing financial assurance for long-term care and maintenance. The proposed rule would eliminate the reference to §30.35(f)(1).

The effect of this change would be to eliminate, 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, at a restricted release site, the options that the NRC is now proposing to eliminate. These options that would no longer be allowed possess characteristics that make their use inadvisable in the types of long-term care and maintenance situations involved in restricted release sites. The proposed rule would continue 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 would be 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 would be eliminated as a 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. The NRC is proposing to require 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) would be the addition of a requirement 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 has 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 the past 30 years, 1975-2005, the annual real rate of return is 1.58 for U.S. Treasury Bills and 4.87 for government bonds. Thus, a 1 percent real rate of return is appropriate for assuring funds under the proposed § 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.

The proposed rule would add 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 would require that the financial assurance must be in the form of a trust fund, as specified in §20.1403(c). Although a requirement to supply financial assurance can be inferred from the current rule, this requirement is not stated explicitly.

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

The proposed rule would amend 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 proposed rule would eliminate the four other prepayment options currently listed in those sections (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 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 decided to eliminate them as alternatives for providing financial assurance for decommissioning.

The NRC recognizes that elimination of the escrow account option would affect some licensees who currently use escrows. The latest data compiled from the NRC's License Tracking System (LTS) indicates that approximately 25 escrows are in use. Because some licensees use more than one escrow, the number of licensees using escrows is slightly less than the number of escrows.

The staff has reviewed several studies of the situation of escrows in bankruptcy, and has 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 document. 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 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. Therefore, the proposed rule would eliminate the escrow as a method to provide financial assurance.

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

The proposed rule would amend 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 would clarify that a parent company providing a parent company guarantee and a licensee providing a self-guarantee are required to set up a standby trust before they may rely on the guarantee for financial assurance, and would add criteria for selecting an acceptable trustee.

The existing regulations do not require the guarantor to set up a standby trust before it provides a parent company or self-guarantee. Instead, a standby trust must be set up and used to hold funds for decommissioning only in the event the NRC requires 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 is 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 will avoid 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 proposed rule would require that the guarantor set up a standby trust. In addition, the proposed rule would provide 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

proposed rule would specify 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, the parent company guarantee option will include a contractual agreement by the parent company to submit to NRC payment orders (10 CFR part 30, appendix A, Section III.F).

The parent company has no present 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 proposed rule would require 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 will be immediately due and payable to the standby trust pursuant to an acceleration clause, discussed in Section II.N.5 of this document. 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.

The existing regulations do 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 proposed rule would authorize the Commission to make the amount guaranteed immediately due and payable to the standby trust (i.e., an acceleration clause).

The proposed rule would clarify that the guarantor's obligation is not capped at the guaranteed amount, but include 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.

The existing 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 under the amendments in this proposed rule.

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 proposed rule would 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 five 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 N.4 and N.5 of this document, will provide a method to obtain funds in situations of financial distress.

Therefore, the proposed rule would 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.

The current regulations require the entity seeking to pass the relevant financial test to have tangible net worth of at least $10 million. The proposed rule amendments would require tangible net worth of at least $19 million.

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. Therefore, it has calculated the new proposed tangible net worth amount using the most recent Implicit Price Deflator for Gross Domestic Product published by the Department of Commerce in its Survey of Current business, and the equivalent Implicit Price Deflator for 1981, by dividing the 2005 Implicit Price Deflator by the 1981 Implicit Price Deflator and multiplying the product times $10 million, as follows: (112.134 / 59.119) = 1.897 x $10 million = $19 million.

The proposed rule also would add a requirement in Section II.A.(1) of appendix C to 10 CFR part 30 for tangible net worth of at least $19 million. Currently, 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 decommissioning cost estimate or certification amount. The proposed amendment would specify tangible net worth of $19 million and 10 times the amount required. This proposed amendment would make 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 proposed rule amendments would 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 proposed rule would state that all the bonds within a specified rating level meet the regulatory standard.

In addition, the proposed rule would amend 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 would make 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 proposed rule would add the requirement that the bond rating used to pass the financial test must be uninsured, uncollateralized, and unencumbered.

The proposed rule would make 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 or above by both Standard and Poor's and Moody's, the licensee no longer would meet the requirements of the financial test.

The proposed 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 proposed rule would require 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 would minimize the potential that an error would be made.

The existing regulations require the licensee to repeat passage of the financial test each year, but do 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 proposed rule would codify the regulatory guidance to require annual submittal of documentation that the guarantor passed the financial test.

The existing regulations are unclear in stating that the parent company guarantee and financial test remain in effect until the license is terminated. The proposed regulations would clarify that the NRC's written acceptance of an alternate financial assurance by the parent company or licensee would allow the guarantee and financial test to lapse.

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

NRC is proposing additions to the regulations related to decommissioning financial assurance as applied to certifications. The proposed changes affect §§ 30.35(c)(6), 40.36(c)(5), and 70.25(c)(5).

The existing rule prescribes 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.

The proposed rule would require 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 occurred at such a site, there would be no regulatory basis to require the licensee to increase its financial assurance to cover the potentially higher decommissioning cost. The proposed rule would provide 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.

The proposed regulations would eliminate the line of credit option from 10 CFR 30.35(f), 40.36(e), 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 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 proposed rule would exclude, 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. The existing rule requires that the calculation of tangible net worth must exclude the book value of the "nuclear units." That requirement may lead to confusion because it implies that it applies 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 would be changed to exclude the net book value of the nuclear facility and site.

The proposed rule would require 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) The existing rule does 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 proposed rule would require 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 proposed rule.

The decommissioning planning and financial assurance amendments in this proposed 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 under the proposed new requirements in § 20.1501(b) or in an application for license transfer consistent with the proposed 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 is Changing with Respect to Materials Facilities' Decommissioning Funding Plan (DFP) and Decommissioning Cost Estimate (DCE)?

The proposed rule would require 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 proposed rule would make the timing basis for DCE adjustments consistent among all materials facilities.

Regarding DFPs, the proposed 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 proposed rule would require 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 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 proposed amendments to 10 CFR 30.35(e)(2), 40.36(d)(2), 70.25(e)(2), and 72.30(b) would 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 would 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 decommissioning cost estimates, and the NRC is codifying some of these recommended methods. To assure that funds will be adequate to complete decommissioning in the event the licensee is unable to do so, cost estimates would be 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 is expected to 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 proposed additional reporting requirements are designed to foster a better understanding of the impact the spill or contaminating event has on the decommissioning cost estimate.

Q. What is Changing With Respect to License Transfer Regulations for Materials Licensees?

The NRC proposes to make a set of parallel changes to §§ 30.34(b)(2), 40.46(a)(2), and 70.36(a)(2). This would 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 is Changing with Respect to Permanently Shutdown Reactor Decommissioning Fund Status and Spent Fuel Management Plan Reporting?

The proposed rule would add a new provision in § 50.82(a)(4)(i) and several new provisions within § 50.82(a)(8) requiring that additional details be included in the post-shutdown decommissioning activities report (PSDAR) and in the annual financial assurance status report.

Currently, the PSDAR must include a description of the planned decommissioning activities, a schedule for their accomplishment, and an estimate of expected costs. In two new provisions to § 50.82(a)(4)(i), NRC is proposing to specify two components that must be included in the estimate of expected costs. These are the cost to decommission the facility, including costs for a period of safe storage, if any, and the cost to manage irradiated fuel.

Under a proposed change to § 50.82(a)(8), each decommissioning power reactor licensee would be required to submit additional information regarding the financial status of 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 accuracy of power reactor funding requirements, accurate data on actual costs is necessary. Therefore, the proposed rule moves the reporting requirement for decommissioning power reactors to § 50.82(a)(8), and information on actual amounts spent for decommissioning will be required on an annual basis. The report will have to include an assessment of the adequacy of funds to complete the decommissioning project, and, if necessary, a plan to obtain additional financial assurance to cover the cost to complete decommissioning. This would improve decommissioning planning and increase the likelihood that funds for decommissioning will be available when needed.

A similar change is being made to require additional reporting of the costs of managing irradiated fuel. Each power reactor licensee must report its plan to manage and provide funding for the management of irradiated fuel under the provisions of § 50.75. Only one report is required under current regulations. Due to the cessation of operating revenues, spent fuel management and related funding are of greater concern after the reactor is permanently shut

down. Therefore, the proposed rule would require an annual report from decommissioning power reactors on the amount of funds accumulated to cover the cost of managing the spent fuel, an estimate of the projected costs of spent fuel management until the Department of Energy takes title to the spent fuel, and a plan to obtain additional funds if the accumulated funds do not cover the projected cost. This would improve decommissioning planning and increase the likelihood that funds for spent fuel management will be available when needed.

S. When Do These Proposed Actions Become Effective?

The new regulations would become effective 60 days after the final rule is published in the *Federal Register*. The NRC estimates that, at the earliest, the final rule will be published in October 2008.

T. Has NRC Prepared a Cost-Benefit Analysis of the Proposed Actions?

NRC staff has prepared a draft Regulatory Analysis for this rulemaking. The analysis examines the costs and benefits of the proposed action and two alternatives. Under the proposed action, the estimated total costs (2007$) are $109 million and $77 million over a 15-year analysis period at 3 percent and 7 percent discount rates, respectively. The estimated total costs were higher for each of the two alternatives. The cost (2007$) of implementing the proposed rule over the 15-year analysis period is about $43 million at 3 percent discount rate, with NRC licensee costs at $6 million, Agreement State licensee costs at $22 million, NRC administrative costs at $3 million, and Agreement State administrative costs at $12 million. The primary benefits of the proposed 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 NRC seeks public comment on the draft Regulatory Analysis. More information on this subject is in Section XI of

this document. The Backfit Analysis is included in the Regulatory Analysis, and is discussed in Section XIII of this document.

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

This proposed 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 proposed rule would have on reporting and recordkeeping requirements of NRC and Agreement State licensees. The NRC seeks public comment on these estimates of additional burden to licensees from the proposed rule. More information on this subject is in Section IX, Paperwork Reduction Act Statement, of this document.

V. What Should I Consider as I Prepare My Comments to NRC?

When submitting your comments on this proposed rule:

1. Identify the rulemaking (RIN 3150-AH45).
2. Explain why you agree or disagree with the NRC proposal; suggest alternatives and substitute language for your requested changes.
3. Describe any assumptions and provide any technical information and/or data that you used.
4. If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow NRC to reproduce your results.
5. Provide specific examples to illustrate your concerns, and suggest alternatives.
6. Explain your views as clearly as possible.
7. Submit your comments by the comment period deadline.
8. NRC has specifically requested comments regarding the following items:

(a) Can "fee incentives" be used, as permitted in 10 CFR 171.11(b), to induce licensees to characterize subsurface residual radioactivity while their facility is operating instead of waiting until the facility is in decommissioning?

(b) Should NRC investigate the use of a secure website for use by licensees to submit and update decommissioning reporting requirements, information in the financial tests for parent guarantees and self-guarantees, and other information that licensees believe will improve the efficiency of the decommissioning planning and reporting process?

(c) Can the additional details that would be required of decommissioned power reactor licensees in the PSDAR under proposed 10 CFR 50.82(a)(4)(i), and reporting of the actual costs of decommissioning before license termination as proposed under 10 CFR 50.82(a)(8)(v), be provided to NRC accurately without reference to confidential information so that NRC may apply the information in reviewing similar decommissioning activities that are planned or in progress?

(d) Are the input assumptions, methodology and results in the draft Regulatory Analysis correct, including the Backfit Analysis? Is the conclusion in the draft Environmental Assessment correct of no significant environmental impact from the proposed rule?

(e) 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 radium-226 sources. Do members of the public have information about these sites to include them in the Regulatory Analysis as licensees affected by this proposed rule?

III. Discussion of Proposed Amendments by Section.

As stated previously, the Commission approved the staff's recommendation to proceed with a proposed rulemaking in SRM-SECY-03-0069 dated November 17, 2003. Staff's

recommendations for changes in licensee operations to prevent future legacy sites were described in attachment 8 to the SECY. Two factors that were common among the existing legacy sites were: (1) They had chronic releases of radioactive material to the subsurface environment, and (2) NRC did not recognize the extent of this contamination until near cessation of operations. To address the problem of chronic releases, staff recommended a revision to § 20.1406 to make it applicable to current licensees. Staff recommended that it would emphasize procedural changes for existing licensees, and that physical changes to the facility only would be warranted when procedures fail to reduce releases. These recommendations are proposed for implementation in § 20.1406(c). To address the reporting deficiencies, staff recommended a risk-informed approach to require sites that experience events that contaminate the subsurface to perform surveys to characterize the extent and migration of resultant plume(s), based on site conditions, and to record the survey information in records important for decommissioning. These are proposed for implementation in §§ 20.1501(a) and 20.1501(b).

SRM-SECY-03-0069 also approved staff's plans to add new, and amend existing financial assurance regulations, including the preparation of decommissioning cost estimates, the contents of DFPs, and acceptable financial assurance instruments used to support the DFP or the certification of funds used only by materials facilities. The recommended changes to financial assurance regulations and reporting requirements were described in attachment 7 to the SECY. Following analysis by NRC staff and input from stakeholders during public meetings, changes are proposed for implementation in 10 CFR parts 30, 40, 50, 70, and 72 to require more detailed reporting of decommissioning financial assurance information and to provide greater certainty to the NRC that adequate financial assurance will be available at the start of decommissioning activities.

The proposed amendments are discussed in numerical order below.

Section 20.1403 Criteria for license termination under restricted conditions.

The proposed rule would amend § 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. The proposed rule would eliminate 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. No licensee to date has used these other prepayment mechanisms to provide financial assurance for a restricted release site.

Amended § 20.1403(c)(1) would 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) would be deleted. This would 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 NRC has concluded that these mechanisms are more suitable for short-term rather than long-term investments, and are not well adapted to provide assurance that an independent third party will have the requisite funds to carry out necessary control and maintenance of the site following license termination. No licensee has to date used these financial mechanisms to provide financial assurance for long-term care of 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) would be retained but redesignated as §§ 20.1403(c)(2) and (3). Section II.N.1 of this document has more information on this proposed amendment.

Section 20.1404 Alternate criteria for license termination.

The proposed rule would add 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 is if 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.

The proposed addition of a new § 20.1406(c) is an extension of the policy articulated by the Commission in 1997, when the LTR was established (62 FR 39082; July 21, 1997). This policy is that licensees must conduct their operations to minimize waste during facility operations to facilitate later decommissioning and to achieve occupational and public doses that are ALARA. The term "residual radioactivity," as already defined in 10 CFR part 20, best 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 II.A of this document has more information on the proposed addition of § 20.1406(c).

Section 20.1501 General.

The 10 CFR 20.1501 survey requirements were added to the regulations in 1991, when 10 CFR part 20 was substantially revised (56 FR 23360; May 21, 1991). To date, these surveys have been done primarily to demonstrate compliance with occupational and public exposure limits, and effluent release regulations.

The current § 20.1501(a) requires licensees to perform surveys of potential radiological hazards. Subsurface contaminating events are not often a risk to occupational or public health and safety; however, experience has shown that these events, because they are not obvious or evident, are a risk for creation of a legacy site if contaminant characteristics are not addressed early when the facility is operating. A legacy site is a potential radiological hazard.

The proposed changes to § 20.1501(a) specify that these 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) will require that surveys be performed if there is reason to believe that significant subsurface contamination is present which constitutes a potential radiological hazard. Section II.A describes these survey requirements in more detail.

The proposed new § 20.1501(b) would 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) would be designated as (c) and existing § 20.1501(c) would be designated as (d).

Section 30.34 Terms and conditions of licenses.

Section 30.34(b) pertains to license transfers. Existing § 30.34(b) would be designated as (b)(1) and a new paragraph (b)(2) would be 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 would be re-designated as §§ 40.46(a) and 70.36(a). New sections 40.46(b) and 70.36(b) will parallel the new § 30.34(b)(2) provisions described previously.

Section 30.35 Financial assurance and recordkeeping for decommissioning.

Several changes would be made to these requirements, and parallel changes would be made in §§ 40.36(c) and 70.25(c). These proposed changes are discussed below.

A new paragraph (c)(6) would be added to 10 CFR 30.35 [and parallel §§ 40.36(c)(5) and 70.25(c)(5)], to reflect the proposed 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 add §§ 40.36(d)(1) and (d)(2), part 40 Appendix A, 70.25(e)(1) and (e)(2), and 72.30(b) and (c)] would be amended to contain new paragraphs

(e)(1) and (e)(2). Section 30.35(e)(1) would require 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), would require 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) would require 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 below, the proposed rule would amend the introductory language in 10 CFR 30.35(f), and amend paragraphs (f)(1) through (f)(3). Parallel changes would be 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) would be 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.

Revised § 30.35(f)(1) requires 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). No byproduct material licensees have elected to use the government fund and deposit of government securities mechanisms, and only 2 have used a certificate of deposit. Because of their relative risk in bankruptcy and their lack of use by licensees, the NRC has decided to eliminate them as alternatives for providing financial assurance for decommissioning. Approximately 25 byproduct material licensees use escrow accounts.

In § 30.35(f)(2), the proposed rule would eliminate the existing line of credit option as a guarantee method for financial assurance. No licensees have elected to use a line of credit to provide financial assurance for decommissioning.

In § 30.35(f)(3), the proposed rule would 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.

A new § 30.35(h) [and in parallel new §§ 40.36(f), 70.25(h), and 72.30(g)] would be added, specifying that each licensee must use its financial assurance funds only for decommissioning activities. The new section also would require 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 5 days after the end of the calendar quarter, deposit funds into the trust account to fully cover the estimated cost. If the loss results in a balance that is below 75 percent of the amount necessary to cover the decommissioning cost, the licensee must, within 5 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.

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

The proposed rule would make a set of parallel amendments to 10 CFR part 30, appendices A, C, D, and E. More information on these proposed changes is discussed in Sections II.N.3 through II.N.8 of this document. 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, the proposed rule would add 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) would be 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, the proposed rule would require that the guarantor's tangible net worth be at least $ 19 million to pass one of the criteria for that financial test. The current rule requires the company seeking to pass the Section II.A financial test to have tangible net worth of at least $ 10 million.

Each set of changes to Appendices A, C, D, and E would require the independent certified public accountant (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 accountant would also have to 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, the proposed rule would 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. In each of these appendices, the proposed rule also would require the bond to be the most recent "uninsured, uncollateralized, and unencumbered" bond issuance.

In each appendix A, C, D, and E of part 30, the proposed rule would make changes to the 90-day test to show continued eligibility for the licensee and guarantor. The current rule requires only the licensee to repeat passage of the test within 90 days after the close of each succeeding fiscal year. The proposed rule would apply the same requirement to the guarantor.

In each appendix A, C, D, and E to part 30, the proposed rule would amend section III to clarify that the guarantor would be required to set up a standby trust, with new criteria for selecting an acceptable trustee.

In appendix A to part 30, the proposed rule would amend 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 would have to 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, the proposed rule would amend 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 would be 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.

The proposed rule would amend § 40.36(c)(5) in changes that are parallel to those described under § 30.35(c)(6); would amend § 40.36(d)(1) and (d)(2) in changes that are parallel to those described under § 30.35(e)(1) and (e)(2); would amend § 40.36(e) in changes that are parallel to those described under § 30.35(f); and would amend § 40.36(f) in changes that are parallel to those described under § 30.35(h).

Section 40.46 Inalienability of licenses.

The proposed rule would amend § 40.46. The proposed changes are described under the section for § 30.34, above.

Part 40 Appendix A.

The proposed rule would amend Appendix A, Criterion 9, to part 40. The proposed changes are parallel to those described under §§ 30.35(e)(1) and 30.35(e)(2).

Section 50.75 Reporting and recordkeeping for decommissioning planning.

The proposed rule would eliminate the line of credit in § 50.75(e)(1)(iii)(A) as a guarantee method for financial assurance. No reactor licensees have elected to use a line of credit to provide financial assurance for decommissioning.

Section 50.82 Termination of license.

The proposed rule would add a new provision in § 50.82(a)(4)(i) requiring 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. The NRC proposes to add §§ 50.82(a)(4)(i)(A) and (B) requiring that decommissioning cost estimates be provided for:

- Decommissioning the facility, including costs for a period of safe storage, if any, and
- Managing irradiated fuel.

The proposed rule also would add paragraphs (v) through (vii) to existing § 50.82(a)(8). New paragraph (v) would require 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. The information contained in this financial assurance status report is discussed in Section II.R of this document.

New paragraph (vi) would require that if funds reported in the financial assurance status report are below the estimated cost to complete the decommissioning, the licensee would have to make up the difference.

New paragraph (vii) would require an annual report on the status of funds for managing irradiated fuel. This report would include 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.

The proposed rule would amend § 70.25. The proposed changes are parallel to those described under § 30.35.

Section 70.36 Inalienability of licenses.

The proposed rule would amend § 70.36. The proposed changes are parallel to those described under § 30.34.

Section 72.30 Financial assurance and recordkeeping for decommissioning.

The proposed rule would amend § 72.30. The proposed changes are similar to those described under § 30.35(e).

Section 72.50 Transfer of license.

The proposed rule would amend § 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.

IV. Criminal Penalties.

For the purpose of Section 223 of the Atomic Energy Act (AEA), the Commission is proposing to amend 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.

V. 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 proposed rule would be 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 proposed 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 Draft 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 would be revised and their corresponding categorization under the "Policy Statement on Adequacy and Compatibility of Agreement State Programs."

Compatibility Table for Decommissioning Planning proposed 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	Decommissioning cost estimates and financial surety [with 11e.(2)]	C	C
40 Appendix A Criterion 9(b)	Amend	Decommissioning cost estimates and financial surety [without 11e.(2)]	NRC	NRC
50.75(e)(1)	Amend	Surety as bond or letter of credit	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
72.30(b)	Amend	Contents of decommissioning 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)	Add	License transfer requirements	-	NRC

* proposed 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 The correct category for both of these sections is H&S.

VI. Plain Language.

The Presidential memorandum dated June 1, 1998, entitled “Plain Language in Government Writing” directed that the Government’s writing be in plain language. The NRC requests comments specifically with respect to the clarity of the language used in the proposed rule. Comments should be sent to the address listed under the "ADDRESSES" caption of the preamble.

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 the methods for preparing decommissioning cost estimates or providing financial assurance for decommissioning that would apply to the requirements that would be imposed by this 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, if adopted, would not have any significant environmental impacts, and therefore this rulemaking does not warrant the preparation of an environmental impact statement.

A copy of the Environmental Assessment and rule are available at the NRC worldwide website: http://www.nrc.gov/public-involve/doc-comment/omb/index.html for 75 days after the

signature date of this notice and are also available at the rule forum site, http://ruleforum.llnl.gov.

The proposed rule would require licensees to conduct their operations so as to identify the occurrence of residual radioactivity at their sites, particularly in the subsurface soil and ground water, and minimize the introduction of additional residual radioactivity. 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 of the licensees affected by this proposed rulemaking may find that compliance with the monitoring requirements 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 proposed rule introduces 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 this rulemaking, 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 NRC finds that this proposed rulemaking will not have a significant environmental impact. Comments on the draft Environmental Assessment may be submitted to the NRC as indicated under the ADDRESSES heading.

IX. Paperwork Reduction Act Statement.

This proposed 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.). This rule has been submitted to the Office of Management and Budget for review and approval of the information collection requirements.

Type of submission, new or revision: Revision.

The title of the information collection: 10 CFR parts 20, 30, 40, 50, 70, and 72, Decommissioning Planning, Proposed Rule

The form number if applicable: Not applicable.

How often the collection is required: Initially, periodically based on regulated activity, quarterly, annually, and at license termination.

Who will be required or asked to report: Licensees and applicants for nuclear power plants and research and test facilities; applicants for and holders of NRC licenses authorizing receipt, possession, use or transfer of radioactive source and byproduct material.

An estimate of the number of annual responses: 239 responses (10 CFR 20 - 0 responses; 10 CFR 30 - 151 responses; 10 CFR 40 - 29 responses; 10 CFR 50 - 9 responses; 10 CFR 70 - 49 responses; 10 CFR 72 – 1 response).

The estimated number of annual respondents: 227 (10 CFR 20 - 0 respondents; 10 CFR 30 - 139 respondents; 10 CFR 40 - 29 respondents; 10 CFR 50 - 9 respondents; 10 CFR 70 - 49 respondents; and 10 CFR 72 - 1 respondent).

An estimate of the total number of hours needed annually to complete the requirement or request: The total burden increase for this rulemaking is 1,210.5 hours (10 CFR 20 - 0 hours; 10 CFR 30 – 853.5 hours; 10 CFR 40 – 132.5 hours; 10 CFR 50 - 48 hours; 10 CFR 70 – 172.5 hours; 10 CFR 72 - 4 hour).

Abstract: The NRC is proposing to amend its regulations to improve decommissioning planning by its licensees who have operating facilities or who are required to have decommissioning financial assurance. A new section in 10 CFR 20.1406(c) and an amended section 20.1501(a) would require licensees to conduct their operations to minimize waste and to perform surveys of subsurface contamination. The amended regulations also would require licensees to report additional details in their decommissioning cost estimates, would eliminate two currently approved financial assurance mechanisms, and would modify the parent company guarantee and self-guarantee financial assurance mechanisms to authorize the Commission to make the amount guaranteed immediately due and payable to a standby trust if the guarantor is in financial distress. Finally, the amended regulations would require decommissioning power reactor licensees to report additional information on the costs of decommissioning and spent fuel management.

The U.S. Nuclear Regulatory Commission is seeking public comment on the potential impact of the information collections contained in the proposed rule and on the following issues:

1. Is the proposed information collection necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?
2. Is the estimate of burden accurate?
3. Is there a way to enhance the quality, utility, and clarity of the information to be collected?

4. How can the burden of the information collection be minimized, including the use of automated collection techniques?

A copy of the OMB clearance package may be viewed free of charge at the NRC Public Document Room, One White Flint North, 11555 Rockville Pike, Room O-1 F21, Rockville, MD 20852. The OMB clearance package and rule are available at the NRC worldwide website: http://www.nrc.gov/public-involve/doc-comment/omb/index.html for 75 days after the signature date of this notice.

Send comments on any aspect of these proposed information collections, including suggestions for reducing the burden and on the above issues, by **[insert date 30 days after publication in the Federal Register]** to the Records and FOIA/Privacy Services Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to INFOCOLLECTS@NRC.GOV and to the Desk Officer, Nathan Frey, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0014; 0017; 0016; 0020; 0011; 0009; and 0132), Office of Management and Budget, Washington, DC 20503. Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given to comments received after this date. You may also e-mail comments to Nathan.Frey@omb.eop.gov or comment by telephone at (202) 395-4650.

X. Public Protection Notification.

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

XI. Regulatory Analysis.

The Commission has prepared a draft regulatory analysis on this proposed rulemaking. An analysis of the proposed rule was performed comparing it against two other alternatives over a 15-year analysis period, using 3 percent and 7 percent real discount rates. The NRC considers the costs of the proposed rule justified in view of the benefits. The primary benefit is a reduction in the number of legacy sites that may occur in the future. The baseline of the analysis assumes No Action is taken and five additional legacy sites require government assistance to achieve completion of decommissioning consistent with unrestricted use criteria. The estimated cost of the proposed rule, with amended regulations as presented in Section III of this document, is about 40 percent lower than if No Action is taken. A third alternative was evaluated that would provide a higher level of assurance than the proposed rule of obtaining funds guaranteed for decommissioning financial assurance, but this requirement of collateral for the guaranteed amount was too costly in relation to the added level of assurance it would provide.

The estimated cost to implement the proposed rule is about $43 million (2007$) at 3 percent discount rate, of which NRC licensee costs are about $6 million, Agreement State licensee costs are about $22 million, NRC administrative costs are about $3 million, and Agreement State administrative costs are about $12 million. The Regulatory Analysis provides a cost breakdown for activities related to implementation of the proposed rule by 10 CFR parts 20, 30, 40, 50, 70, and 72.

The Commission requests public comment on the draft Regulatory Analysis. A copy of the Regulatory Analysis and rule are available at the NRC worldwide website: http://www.nrc.gov/public-involve/doc-comment/omb/index.html for 75 days after the signature date of this notice..

XII. Regulatory Flexibility Certification.

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the Commission certifies that this rule would not, if promulgated, 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.

XIII. Backfit Analysis.

As discussed more fully in the draft Regulatory Analysis, the NRC has determined that the NRC's rules on backfitting, 10 CFR 50.109, 70.76, 72.62, and 76.76, do not require the preparation of a backfit analysis for this proposed rule. 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 proposed rule either clarify existing requirements, or require the collection and reporting of information using existing equipment and procedures. The proposed changes to requirements are not regulatory actions to which the backfit rule applies. The new and amended NRC regulations being proposed in this rulemaking are summarized below.

The "Minimization of contamination" requirements in 10 CFR 20.1406 would be 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 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 two existing regulations applicable to licensed operations. To comply with the current ALARA dose requirements in 10 CFR 20.1101(b) and 10 CFR 20.1402 (within existing subparts B and E, respectively), licensees must have operating procedures to minimize the introduction of residual radioactivity into their site, including the subsurface. Otherwise, licensees may lack information to provide a basis to demonstrate that they have achieved – during the life cycle of the facility which includes the decommissioning phase – public and occupational exposures that are ALARA. Licensees should already have these procedures in place as part of their radiation protection program, and the proposed 20.1406(c) clarifies this requirement.

Existing 10 CFR 20.1501(a) is being revised by replacing its undefined phrase "radioactive material" with a defined term "residual radioactivity." 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). This regulation (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, and that the radiological surveys required by this section must address subsurface residual radioactivity. This clarification of existing requirements does not require the preparation of a backfit analysis.

Another proposed amendment would add a new subsection (b) to 10 CFR 20.1501, requiring that survey records describing the location and amount of subsurface residual radioactivity identified at a licensed site be kept with records important for decommissioning.

Regulatory changes imposing information collection and reporting requirements do not constitute regulatory actions to which the backfit rule applies. Additionally, 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. 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. 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.

The proposed rule 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 governed by 10 CFR Parts 50, 70, or 72. The proposed changes concern administrative matters which are outside the scope of protection afforded by the NRC's backfitting rules (10 CFR 50.109, 70.76, and 72.62). Therefore, preparation of a backfit analysis is not required for the proposed revisions to the decommissioning planning and financial assurance requirements.

Accordingly, the proposed rule's provisions do not constitute a backfit and a backfit analysis need not be performed. The draft regulatory analysis identifies the benefits and costs of the proposed rule, discusses the voluntary GPI, and evaluates other options for addressing the identified issues. The draft regulatory analysis constitutes a "disciplined approach" for evaluating the merits of the proposed rule and is consistent with the intent of the backfit rule.

The Commission requests public comment on the backfit issues summarized above and as set forth more fully in the draft Regulatory Analysis (which is available as discussed under the ADDRESSES heading). Single copies may be obtained from the contact listed under the FOR FURTHER INFORMATION CONTACT heading. Comments on the draft Backfit Analysis may be submitted to the NRC as indicated under the ADDRESSES heading.

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. 553, the NRC is proposing to adopt 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), Energy Policy Act of 2005, Pub. L. 109–58, 119 Stat. 594 (2005).

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 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. Acceptable financial assurance mechanisms are specified in § 20.1403(c) of this part.

*****

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 in a timely manner --

*****

(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.

*****

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).

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 § 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 decommissioning cost estimate;

(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 re-submitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted, 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 5 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 5 days of the occurrence.

(3) Within 30 days of taking the actions required by paragraphs (h)(1) or (h)(2) of this section, the licensee must report such actions to the NRC, 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. Financial Test

A. To pass the financial test, the parent company must meet the criteria of either paragraph A.1 or A.2 of this section. 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 $ 19 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 $19 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.

*****

III. Parent Company Guarantee

*****

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. Financial Test

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 $ 19 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. Company Self-Guarantee

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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 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. Financial Test

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 $19 million, or 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. Company Self-Guarantee

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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 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.

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. Financial Test

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. Self-Guarantee

*****

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 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. (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 (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.

*****

(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 decommissioning cost estimate;

(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 re-submitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will

be adjusted, 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:

*****

(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.

*****

(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 5 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 5 days of the occurrence.

(3) Within 30 days of taking the actions required by paragraphs (g)(1) or (g)(2) of this section, the licensee must report such actions to the NRC, 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

*****

II. Financial Criteria

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 residual radioactive material in onsite subsurface material;

(3) Identification of and justification for using the key assumptions contained in the decommissioning cost estimate; 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 residual radioactivity in onsite subsurface material that must be remediated to meet license termination 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 period of time (e.g., 5 years) that 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 period of 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 or credit.

(4) Parent company guarantee under appendix A to 10 CFR part 40.

(iv) Combinations of the above 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.

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, 105, 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). 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) is 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:

*****

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, but no later than, 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 include 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 cost estimates for:

(A) Decommissioning the facility, including costs for a period of safe storage, if any; and

(B) Managing irradiated fuel until title to the fuel and possession of the fuel is transferred to the Secretary of Energy.

*****

(8) ***

(v) After submitting its site-specific decommissioning cost estimate required by paragraph (a)(8)(iii) 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) In the years following the submittal of the cost estimate for managing irradiated fuel 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 decommissioning cost estimate;

(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 re-submitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted, 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 5 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 5 days of the occurrence.

(3) Within 30 days of taking the actions required by paragraphs (h)(1) or (h)(2) of this section, the licensee must report such actions to the NRC, 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 § 72.30, paragraph (b) is revised, paragraph (c) is redesignated as paragraph (e) and the introductory text of paragraph (e), paragraphs (e)(1), the introductory text of paragraph (e)(2) and paragraph (e)(3) are revised, paragraph (d) is redesignated as paragraph (f), 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 of this chapter criteria for unrestricted use, provided that, if the applicant or licensee can demonstrate its ability to meet the provisions of § 20.1403, 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 decommissioning cost estimate.

(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 re-submitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted, 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 (as described in paragraph (e) of this section) 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.

*****

(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 5 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 5 days of the occurrence.

(3) Within 30 days of taking the actions required by paragraphs (1) or (2) of this section, the licensee must report such actions to the NRC, and state the new balance of the fund.

25. In Section 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.

* * * * *

Dated at Rockville, Maryland, this _____ day of _____, 2007.

For the Nuclear Regulatory Commission.

_____
Annette Vietti-Cook,
Secretary for the Commission.

Regulatory Analysis for Proposed Rulemaking - Decommissioning Planning

Draft for Comment

U.S. Nuclear Regulatory Commission
September 2007

EXECUTIVE SUMMARY

The Nuclear Regulatory Commission (NRC) has published a proposed rule (RIN: 3150-AH45) to amend 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 in decommissioning status with complex issues and an owner who cannot complete the decommissioning work for technical or financial reasons.

There are a small number of NRC and Agreement State legacy sites that may someday need to rely on State or Federal government funding to decommission the site consistent with unrestricted use criteria. This government response is unpredictable, time consuming and expensive. Legacy sites are potential radiological hazards, and the delay in cleanup introduces additional risk to occupational and public health and safety during later decommissioning.

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 material licensees are at risk to have significant residual radioactivity in their subsurface environment and would need to perform additional site surveys to identify the residual radioactivity, as required in proposed changes to 10 CFR 20.1406 and 20.1501. Staff has no basis that other licensees would need to perform additional surveys, including power reactors, fuel cycle facilities, and the large majority of source and byproduct material facilities. About 45 licensees would be affected by tighter controls and additional reporting requirements in proposed changes to the parent guarantee and self guarantee decommissioning financial assurance regulations. A few licensees would be affected by the additional annual reporting requirements under proposed changes to 10 CFR 50.82. About 20 licensees would be affected by the proposed elimination of the escrow account and would have a one-time cost to switch to a trust agreement as financial assurance.

This Regulatory Analysis provides an evaluation of three alternatives. The preferred alternative is Alternative 2 which would change regulations as specified in the proposed 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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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 Nuclear Regulatory Commission (NRC) is proposing to amend 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 in decommissioning status with complex issues and 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.

NRC regulates 32 of what it terms to be complex decommissioning sites, of which 8 are legacy sites. 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 as part of required decommissioning planning. 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 Proposed Action

One proposed action evaluated in this Regulatory Analysis is a set of proposed 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) are being worded to include subsurface contamination within their scope. Consistent with this approach, both provisions would contain the "residual radioactivity" term, which serves to reinforce the intended linkage between these provisions. These proposed 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 proposed 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 would require licensees to report additional details of their decommissioning cost estimates, including estimated cleanup costs for subsurface contamination. The amended regulations would eliminate two currently approved financial assurance mechanisms, and would 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 would 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 Proposed Action

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 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. The current regulatory guidance does 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. Current regulations do not require the licensee to increase its decommissioning funding assurance following a 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) would 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. Because current regulations do not require NRC approval of the licensee's initial decommissioning cost estimate, underestimation of decommissioning costs could become a more widespread problem for materials facilities. Amendments to 30.35(e), 40.36(d) and 70.25(e) would require all materials 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 cost 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) would require nuclear power reactor licensees, whose reactor is in a decommissioning status, to

report to the NRC an assessment of the funds required to complete decommissioning, the funds presently available, and the plan to obtain additional funds if there is a shortage. The licensee would also be required to report to the NRC the final cost of radiological decommissioning.

Additional reporting requirements for decommissioning power reactor licensees are proposed regarding long-term funding of spent fuel management. Such expenses are at risk of being under-funded by licensees who operate a merchant plant. Current regulations require 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 is thus a risk of this information becoming outdated. Amendments to 50.82(a) would require an annual report from decommissioning power reactors on the amount of funds accumulated to cover the cost of managing irradiated fuel, an estimate of the projected costs until title to the fuel is transferred, and a plan to obtain additional funds if the accumulated funds do not cover the projected costs.

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 current regulations allow financial assurance mechanisms that are 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) would require 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. Current regulations do not require the licensee to monitor investment balances in the funds held for decommissioning. Nor must licensees replace investment losses in a timely manner if the funding assurance falls 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) would require the licensee to monitor the investment balance and to replenish the fund within a certain amount of time if there is investment loss that reduces the fund below the decommissioning cost estimate.

Two presently authorized financial assurance mechanisms are at 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 than an escrow 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, 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. The proposed rule would eliminate 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. The recommendations are being addressed by NRC program offices, but one recommendation is being completed in concert with this proposed 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 PROPOSED RULE

Section 2.1 identifies the technical basis for proposed 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 proposed 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) current regulations. Residual radioactivity issues at certain types of licensees, and the extent to which the proposed amendments would affect these licensees, are then discussed.

Stakeholder Input at Public Meetings

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 70 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 proposed 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.

Staff assessments

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 degraded cladding will be stored until 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 the rare earth extraction source material facilities currently licensed under 10 CFR Part 40 are considered plausible candidates to be affected by proposed 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 proposed amendments because these licensees have since implemented effective ALARA prevention and monitoring programs to identify residual radioactivity in areas at their sites.

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.

Current Regulations

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. Draft Regulatory Guide DG-4012, 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).

10 CFR 20.1501 requires 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 pursuant to this regulation has been to conduct surveys when needed for occupational dose assessment, not for environmental records important to decommissioning.

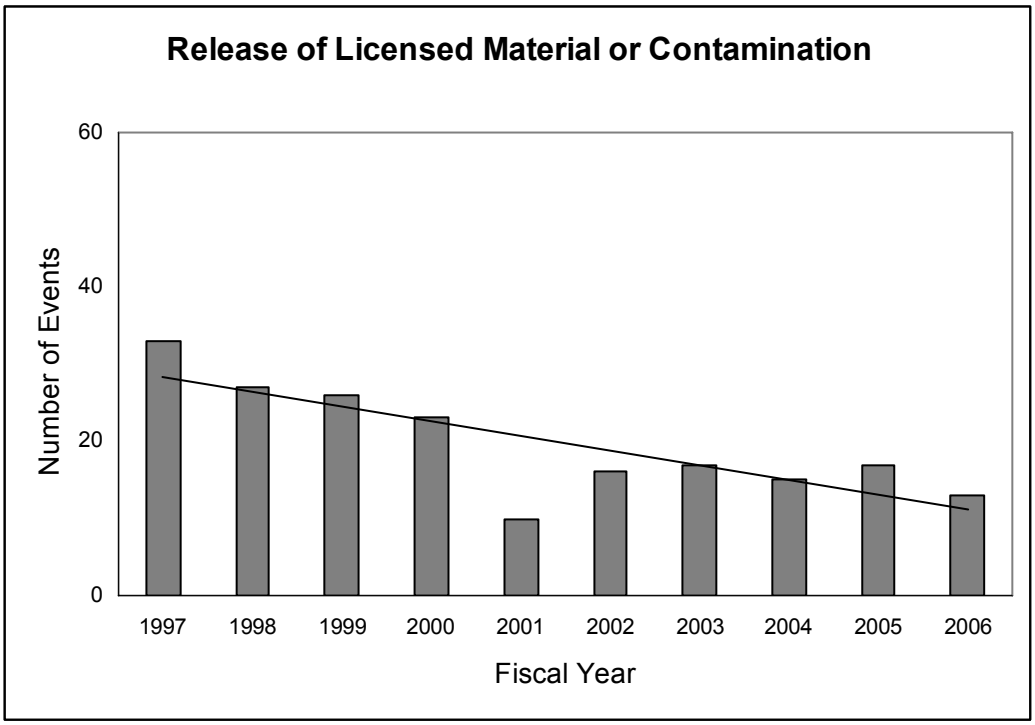
Appendix A of 10 CFR 50, General Design Criteria Number 64, Monitoring Radioactivity Releases, requires the nuclear power reactor licensee to monitor "the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents." 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 U^F6 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. NRC staff has issued a revised baseline inspection module (Procedure 71122.01, Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems) used to inspect leaks and spills at power reactor sites.

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 proposed amendments to 10 CFR 20.1406(c) and 20.1501. 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 proposed amendments to 10 CFR 20.1406(c) and 20.1501.

The proposed amendment to 10 CFR 20.1406(c) is compatible 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 proposed rule for licensee implementation of proposed 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 negligible effluent release, and no abnormal releases. 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 proposed amendments to 10 CFR 20.1406(c) and 20.1501. Additional monitoring and reporting could be required at these facilities if significant residual radioactivity is identified above current levels, but at this time there is no evidence of residual radioactivity at levels that would require monitoring methods in addition to those currently in use by the research and test reactor licensees.

2.1.3 Uranium Fuel Fabrication Plants

There are 6 operating uranium fuel fabrication plants licensed by the NRC. Five of the plants receive U^F6 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, and no abnormal releases, 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 proposed amendments to 10 CFR 20.1406(c) and 20.1501. 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 proposed amendments to 10 CFR 20.1406(c) and 20.1501.

The proposed amendment to 10 CFR 20.1406(c) for operating facilities is compatible 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 proposed rule for licensee implementation of proposed 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 proposed amendments to 10 CFR 20.1406(c) and 20.1501. Additional monitoring and reporting could be required at these facilities if significant residual radioactivity is identified above current levels, but at this time there is no evidence of residual radioactivity at levels that would require monitoring methods in addition to those currently in use by the critical mass facility licensees.

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 will be affected by the proposed 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, and no abnormal releases, 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 proposed amendments to 10 CFR 20.1406(c) and 20.1501.

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 proposed 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 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 proposed amendments to 10 CFR 20.1406(c) and 20.1501. Additional monitoring and reporting could be required at this facility if significant residual radioactivity is identified above current levels, but at this time there is no evidence of residual radioactivity at levels that would require monitoring methods in addition to those currently in use by the plant.

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. 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.

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 uranium mills, ISL facilities and sewage treatment plants will not be affected by the proposed amendments to 10 CFR 20.1406(c) and 20.1501. Additional monitoring and reporting could be required at these types of facilities if significant residual radioactivity is identified above current levels, but at this time there is no evidence of residual radioactivity at levels that would require monitoring methods in addition to those currently in use by these facilities.

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 proposed 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 proposed rule. The specific input assumptions used in a cost-benefit analysis of the proposed amendments are described in Section 4 of this document. The results are presented in Section 5 of this document.

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 proposed amendments to 10 CFR 20.1406(c) and 20.1501. Additional monitoring and reporting could be required at these facilities if significant residual radioactivity is identified above current levels, but at this time there is no evidence of residual radioactivity at levels that would require monitoring methods in addition to those currently in use by the licensees.

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 as licensees affected by proposed changes to 10 CFR 20.1406(c) and 20.1501.

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 the proposed rule.

The lessons learned component of the workshop also identified factors affecting decommissioning that are being addressed in proposed rulemaking. 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 70 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 proposed 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 proposed 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 that is proposed to be added to the guarantee instrument would require 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, the proposal to eliminate 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) The proposed rule would require bonds used in the parent company and self-guarantee financial tests to be uninsured, uncollateralized, and unencumbered. This is based on the analysis in NUREG/CR-6514 and

will make the bond rating requirements 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 proposed rule to require that the guarantor's tangible net worth be at least $19 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 proposed 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 proposed 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 draft rule text, or in the analysis of Alternative 2 in this Regulatory Analysis, which is the preferred alternative. 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 this Regulatory Analysis, 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.

Current Regulations

The following two sections describe the current regulatory framework and how that framework would be revised by the proposed rule. The proposed amendments are in two sections. Section 2.2.1 includes the amendments that would provide accurate information in decommissioning cost estimates. Section 2.2.2 includes the amendments that would 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 proposed rule have the objective of providing the NRC with an accurate decommissioning cost estimate (DCE). They are discussed individually below.

Proposed Changes to §§ 30.35(e), 40.36(d), Criterion 9(b) to Appendix A to Part 40, and 70.25(e)(1)]

The current regulations require 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 amendments would specify 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 amendments would specify that a DCE for Part 30, Part 40 (except for licensees subject to Appendix A to Part 40), and Part 70 licensees

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).

Proposed Changes to §50.82(a)(4)(i) and (a)(8)(v)

The current regulations require 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 are 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 proposed amendment to 10 CFR 50.82(a)(4)(i) would make clear that the cost estimate in the PSDAR must include estimates for decommissioning the facility and managing irradiated fuel until title to the fuel and possession of the fuel is transferred to the Secretary of Energy. The proposed amendment to 10 CFR 50.82(a)(8)(v) would require annual reporting of a financial assurance status report with current amounts spent and estimated to be spent to complete decommissioning, and other material changes related to financial assurance.

2.2.2. Tighter Controls

The following proposed 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.

Proposed Changes to §§ 30.35(c)(6), 40.36(c)(5) and 70.25(c)(5)

The current regulations allow 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 proposed amendments would 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 have no requirement under the current rule to increase the amount of financial assurance to cover subsurface remediation costs. The proposed 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.

Proposed Changes to §§ 30.35(f), 40.36(e), 70.25(f), 72.30(e)

The existing regulations allow 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 proposed rule will eliminate the escrow as a method to provide financial assurance. About 25 licensees with escrow accounts will be affected by this proposed change.

The existing regulations allow 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 proposes to eliminate this option.

Proposed Changes to §§ 30.35(i), 40.36(h), 70.25(i), and 72.30(g)

The existing regulations allow funds set aside for decommissioning to be placed in accounts that are subject to market fluctuations. There is no requirement of licensees to monitor the fund balance and replace in a timely manner shortfalls that occur when market prices decline. The proposed amendments to the regulations will require the licensee to monitor the fund balance and will specify 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. Requiring timely replacement of market losses will increase the likelihood that funds will be available for decommissioning when needed. This amendment is being made as one of many separate assurances that funds will be available for decommissioning.

Proposed Change to §§ 20.1403(c) and 20.1404(a)(5)

The existing regulations allow licensees to use several financial assurance mechanisms to provide decommissioning financial assurance for restricted site release, but specify 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 proposed amendments to the regulations would require licensees to place adequate funds into a trust for the purpose of long-term control and maintenance, and would eliminate sureties, insurance, other guarantee methods, and other forms of prepayment for restricted site release cases. Government entities would continue to be permitted to use a statement of intent or to assume custody and ownership of a site. The proposed amendments to the regulations would require 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 would be required to use a trust as the financial assurance mechanism. None of the current licensees will be affected by this proposed change. This amendment is being made as one of many separate assurances that funds will be available for decommissioning.

Proposed Changes to §§ 30.34(b), 40.46, 70.36, and 72.50(b)(3)

The existing regulations do not specify required information of the transferee as part of the request for license transfer. The amendments would codify 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. None of the licensees will be affected by this proposed change. This amendment is being made as one of many separate assurances that funds will be available for decommissioning.

Proposed Changes to §§ 30.35(f), 40.36(e), 70.25(f), and 72.30(e)

The existing regulations specify 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 proposed amendments would require 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 would be 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 is being made as one of many separate assurances that funds will be available for decommissioning.

Proposed Changes to Parent Guarantee and Self Guarantee Methods [Appendices A, C, D, and E to 10 CFR Part 30]

The existing rule specifies a minimum tangible net worth requirement of $10 million, which was first adopted by the EPA in 1981 and adopted by the NRC in 1998 (53 FR 24046). This amount for minimum tangible net worth has not been changed to account for inflation. Therefore, to provide for inflation, the amended amount is $19 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 $19 million.

The existing rule in Appendices A and C to 10 CFR Part 30 does 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 amendments 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 proposed change.

The existing rule specifies the bond ratings required to pass the financial test. The proposed rule will clarify that qualifiers at the low end of the bond ratings, for example "-" and "3", meet the regulatory standard. The amendments also will require an annual verification of the bond rating. None of the licensees who use the parent guarantee or self guarantee will be affected by this proposed change.

The existing rule does 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 amendments would require the auditor to include an opinion of off-balance sheet transactions. 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 proposed change.

The existing rule requires the licensee to repeat passage of the financial test each year, but does not explicitly state that the licensee must annually submit documentation to the NRC to verify its passage of the test. The proposed rule will require 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 proposed change, but at a very low additional cost.

The existing rule does 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 amendments would require the guarantor to set up a standby trust, will provide the Commission with the right to change the trustee, and will specify 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 proposed change.

The existing rule does not specify the guarantor's obligation to fund decommissioning work to terminate the license. The amendments would clarify 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.

The existing rule does not require the parent company to comply with Commission orders. The amendments would clarify the parent company guarantee to include 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.

The existing rule does 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 amendments would authorize 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 proposed 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 proposed 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 for rare earth extraction operations. This could include uranium, thorium or other rare earth elements.

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 4 Agreement State licensed rare earth extraction facilities also will become legacy sites, for a total of 5 additional legacy sites.

The 5 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 determinate 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 Proposed Financial Assurance Changes

Alternative 2, the preferred approach, would implement 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 proposed amendments beginning in year 1. The amendments may affect different numbers of licensees. For example, 240 licensees are assumed to be affected by the proposed amendment to 10 CFR 30.35(f) to report on a one-time basis additional information in the financial assurance mechanism, whereas only 1 licensee is assumed to be affected by proposed 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 proposed 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 Proposed 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 proposed rule. The benefits and costs are analyzed for implementation of the proposed rule under Alternatives 1, 2 and 3.

The affected attributes for the proposed 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 proposed 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 $109 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 proposed 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 costs are anticipated for this attribute.

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. ***Offsite Property***. A slight benefit is anticipated to offsite property due to a reduction in the incidence of ground-water contamination migrating beyond the site boundary before decommissioning is completed. No costs are anticipated for this attribute.

5. ***Onsite Property***. A slight benefit is anticipated to onsite property for the same reasons provided above for offsite property. No costs are anticipated for this attribute.

6. ***Industry Implementation***. Industry would incur one-time costs, both capital and labor, to implement the rule. Alternative 3 includes the implementation costs in Alternative 2, and the additional costs associated with the collateral requirement for the guarantees.

7. ***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.

8. ***NRC Implementation***. NRC will incur one-time costs to support development of the rule following publication in the *Federal Register* through publication of the final rule. 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.

9. ***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.

10. ***Other Government***. The proposed 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.

11. ***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.

12. ***Regulatory Efficiency***. The proposed rule would 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 would 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.

13. ***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 proposed rule, contains more information. No costs are anticipated for this attribute.

14. ***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, as a result of the perception that decommissioning requirements have been strengthened 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. ***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 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 proposed 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 would amend 10 CFR 20.1406 and 20.1501 and would make 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 would be 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 proposed 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 proposed 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 proposed rule will affect certain licensees based on the specific section of regulation. For example, we assume 10 licensees will be affected annually by the proposed 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 proposed 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 proposed amendments in 10 CFR Parts 20, 30, 40, 50, 70 and 72 and are shown in Appendix B.

- Amendments in this proposed rule would reduce the number of approved financial assurance mechanisms and would require certain licensees to use a Decommissioning Funding Plan instead of a certified amount for decommissioning financial assurance. Elimination of the escrow account is proposed and affects the following number of NRC licensees: 14 in Part 30, 3 in Part 40, and 2 in Part 70. The proposed 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 1 licensee each year under Parts 30, 40, and 70. Another proposed change is to require 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.

- The only effect for power reactors licensed under Part 50 is due to increased reporting requirements under changes to 10 CFR 50.82 for an estimated 3 licensees per year.

- Except as noted above, the only other effect for fuel cycle facilities licensed under Part 70 is due to increased reporting requirements under changes to 10 CFR 70.25 and 70.36.

- Except as noted above, the only other effect for licensees with a facility licensed under Part 72 is due to increased monitoring of funds under changes to 10 CFR 72.30.

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	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 proposed 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 proposed 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	109,005	76,767
3. Monitoring, Financial Assurance plus Security Interest in Collateral for Parent and Self-Guarantees	368,798	276,303

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 proposed 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 $22 million, and Agreement State costs are about $12 million. The implementation of the proposed 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. At the 3 percent discount rate for Alternative 2, about $28 million of the total $109 million is for implementation of the proposed rule by industry, due to one-time implementation and multi-year operating costs, and $15 million of the total is for implementation of the proposed 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	6,984	6,984	7,819	7,819
Industry Operation	86,782	54,544	343,228	250,197
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	109,005	76,767	368,798	276,303

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 proposed 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 – prop rule	7.2	2,200.4	1,678.8		-	-	-
Part 20 A/S—prop rule	28.8	8,801.6	6,715.1		-	-	-
Part 20 total	36.0	11,002.0	8,393.9		36.0	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 – prop 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 – prop rule	0	43.0	32.8		0	43.0	32.8
Part 70 NRC – prop 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 – prop rule	0	5.7	4.4		-	-	-
Part 72 NRC – collateral	0	0	0		4.5	11,985.7	9,144.3
Part 72 NRC total	0	5.7	4.4		4.5	11,991.4	9,148.7
Total NRC and A/S	6,983.9	86,782.1	54,544.4		7,819.2	343,228.3	250,197.0

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 proposed rule (prop 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

NRC staff has issued a revised baseline inspection module (Procedure 71122.01) used to inspect leaks and spills at power reactor sites. This and other inspection criteria will be used to review the effectiveness of the GPI to identify occurrences of residual radioactivity at power reactor sites.

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 proposed amendments to 10 CFR 20.1406(c) and 20.1501. 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 proposed amendments to 10 CFR 20.1406(c) and 20.1501. If NRC publishes a final rule following the public comment period of this Decommissioning Planning proposed rule, 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 October 2008. The NRC staff conclusion noted above 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 implementing amendments discussed in this proposed 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 proposed rule requirements.

The results shown in Section 5 provide no credit for the GPI because the activities by licensees were undertaken before development of the proposed 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 rules on backfitting, 10 CFR 50.109, 70.76, 72.62, and 76.76, do not require the preparation of a backfit analysis. 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 proposed rule either clarify existing requirements, or require the collection and reporting of information using existing equipment and procedures. The proposed changes to requirements are not regulatory actions to which the backfit rule applies. The new and amended NRC regulations being proposed in this rulemaking are summarized below.

The proposed rule would, in part, amend 10 CFR 20.1406 and 20.1501. Section 20.1406, "Minimization of contamination," would be 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 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 two existing regulations applicable to licensed operations. To comply with the current ALARA dose requirements in 10 CFR 20.1101(b) and 10 CFR 20.1402 (within existing subparts B and E, respectively), licensees must have operating procedures to minimize the introduction of residual radioactivity into their site, including the subsurface. Otherwise, licensees may lack information to provide a basis to demonstrate that they have achieved – during the life cycle of the facility which includes the decommissioning phase – public and occupational exposures that are ALARA. Licensees should already have these procedures in place as part of their radiation protection program, and the proposed 20.1406(c) clarifies this requirement.

The staff continued position of the proposed revision to 10 CFR 20.1406 as an extension 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).

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. These operating procedures and controls need to include methods to minimize the introduction of residual radioactivity into the site, including the subsurface, to achieve doses that are ALARA. Otherwise, licensees may lack information to provide a basis to demonstrate that they have achieved, during the life cycle of the facility including decommissioning, public and occupational exposures that are ALARA. The concept of reducing residual radioactivity to ALARA as part of the decommissioning criteria has been a position of the NRC since at least 1994 (NUREG-1501, page iii).

Section 20.1501, "General" (part of Subpart F, "Surveys and Monitoring"), would be 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 in a timely manner --
(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 proposed 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). This regulation (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, and that the radiological surveys required by this section must address subsurface residual radioactivity. This clarification of existing requirements does not require the preparation of a backfit analysis.

As set forth above, a new subsection (b) to 10 CFR 20.1501 would require that survey records describing the location and amount of subsurface residual radioactivity identified at a licensed site be kept with records important for decommissioning. Regulatory changes imposing information collection and reporting requirements do not constitute regulatory actions to which the backfit rule applies. Additionally, 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. 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. 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.

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) will require 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. It is 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 to which the backfit rule applies (i.e., power reactors, fuel cycle facilities, and the gaseous diffusion plants) 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. Each of the two gaseous diffusion plants, certified under 10 CFR part 76, has an extensive ground water monitoring program managed by DOE. USEC provides copies to the NRC of each gaseous diffusion plant annual radionuclide emissions report. NRC staff concludes that the monitoring systems at power reactors, fuel cycle facilities and gaseous diffusion plants likely would generate sufficient information to meet the objectives of the proposed amendments to 10 CFR 20.1501(a) and (b) set forth above. NRC anticipates no additional survey requirements for licensees with independent spent fuel storage installations (ISFSI) because these facilities do not have credible source terms to create subsurface contamination.

The proposed rule 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 governed by 10 CFR Parts 50, 70, or 72. The proposed changes concern administrative matters which are outside the scope of protection afforded by the NRC's backfitting rules (10 CFR 50.109, 70.76, and 72.62). Therefore, preparation of a backfit analysis is not required for the proposed revisions to the decommissioning planning and financial assurance requirements.

Accordingly, the proposed rule's provisions do not constitute a backfit and do not require the preparation of a backfit analysis. This regulatory analysis identifies the benefits and costs of the proposed 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 proposed rule and is consistent with the intent of the backfit rule.

8. DECISION RATIONALE AND IMPLEMENTATION

The assessment of costs and benefits discussed previously leads the NRC to the conclusion that the proposed rule, if implemented, would improve licensees' decommissioning planning and reduce the likelihood that a currently operating licensed facility will become a legacy site. In the past, 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 proposed in §§ 20.1406(c) and 20.1501, and the set of financial assurance amendments proposed in 10 CFR Parts 20, 30, 40, 50, 70, and 72, would 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 would maintain the regulations as currently written. NRC anticipates under this alternative 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. The estimated cost associated with Alternative 1 is higher than the preferred Alternative 2.

Alternative 2 would make the amendments in §§ 20.1406 and 20.1501, and the set of financial assurance amendments in 10 CFR Parts 20, 30, 40, 50, 70, and 72, as discussed in Sections 1.1 and 1.2. There would be no additional legacy sites in Alternative 2. The proposed amendments in Alternative 2 would increase licensee reporting and recordkeeping requirements, and the time and resources expended by NRC and Agreement States, compared to current regulations. Alternative 2 would increase the certainty that NRC will obtain licensees' decommissioning financial assurance funds even if the licensee enters bankruptcy.

Alternative 3 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. The security interest in collateral is much higher cost compared to Alternative 2, and 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, the proposed Alternative 2 is superior to Alternative 1 and Alternative 3.

The proposed rule is planned for publication in the *Federal Register* in late 2007. Following a public comment period and several months to review the public comments, staff will revise the proposed rule as appropriate and submit to the Commission in late 2008 a proposed final rule.

9. REFERENCES

1. Federal Register notice, Final Rule, Radiological Criteria for License Termination (62 FRN 39082).
2. Recent inspection reports citing the need for byproduct material licensees to improve their documentation of records important for decommissioning may be obtained from ADAMS accession numbers ML070470568, ML071160475, and ML071090194.
3. An early estimate of CY decommissioning cost ($426.7 million in 1996 dollars) is available from http: //www.connyankee.com/assets/pdfs/Document1.PDF. A current cost estimate ($937.6 million in 2006 dollars) is available from CY License Termination Plan, Rev. 4., Table 7-1, 11/16/2006 [ML063390404].
4. SECY-03-0069, Attachment 7, page 6 [ML070470568].
5. SECY-03-0069 [ML030870180].
6. Liquid Radioactive Release Lessons Learned Task Force Final Report, US NRC, September 1, 2006 [ML062650312].
7. Draft guidance written by James Shepherd for this proposed rule.
8. NRC Decommissioning Workshop, April 20 and 21, 2005, NRC, Office of Material Safety and Safeguards, Division of Waste Management and Environmental Protection (DWMEP); and Official Transcript of Proceedings, Public Meeting, NRC, Rulemaking to Reduce the Likelihood of Funding Shortfalls for Decommissioning under the License Termination Rule, January 10, 2007. Both are on the NRC Public Involvement in Decommissioning web site at http://www.nrc.gov/about-nrc/regulatory/decommissioning/public-involve.html.
9. General Guidance for Inspections and Enforcement to Prevent Future Legacy Sites, Integrated Decommissioning Improvement Plan (IDIP), Revision 1, item 4.2, dated September 23, 2005 [ML052630421].
10. NUREG-1496, Volume 1, "Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities Main Report, Final Report" [ML0423104920].
11. NUREG/CR-6642, Vol. 1, "Risk Analysis and Evaluation of Regulatory Options for Nuclear Byproduct Material Systems," February 2000 [ML003678058].
12. NUREG/CR-6477, "Revised Analyses of Decommissioning Reference Non-Fuel-Cycle Facilities," December 2002 [ML0301605731].
13. Nuclear Regulatory Commission (U.S.), “Minimization of Contamination and Radioactive Waste Generation – Life Cycle Planning,” Draft Regulatory Guide DG-4012 released for public comment July 31, 2007 (72 FR 41794).
14. Nuclear Energy Institute, “Industry Ground Water Protection Action Plan Development, Interim Guidance Document – June 2006, Action Plan Development and Voluntary Communication” [ML061950015 and ML061950017]. Nuclear Energy Institute, “Industry Ground Water Protection Initiative – Final Guidance Document," August 2007 [ML072600295; ML072610029; ML072610036].
15. Regulatory Issue Summary 2006-09, "NRC’s Procedures for Review of Decommissioning Funding Assurance Reports," June 21, 2006 [ML061100154].
16. NUREG-1775, "Final Report ISCORS Assessment of Radioactivity in Sewage Sludge: Radiological Survey Results and Analysis," November 2003 [ML033140171].
17. SECY-04-0226 [ML0432200260].
18. “Program Evaluation of Changes to the Decommissioning Program,” NRC, NMSS, Division of Waste Management, September 2003.
19. “Integrated Decommissioning Improvement Plan, FY 2004-2007, Revision 1,” NRC, DWMEP, March 29, 2005.
20. “NRC Regulatory Issue Summary 2004-08, Results of the License Termination Rule Analysis,” NRC, NMSS and NRR, May 28, 2004.
21. “Evaluation of the Financial and Legal Risks that Funds Will Not Be Available When Needed for Decommissioning Materials Licenses,” Draft Report, ICF Incorporated, LLC, January 2006.
22. FANSTEEL, INC., et al., No. 02-10109, U.S. Bankruptcy Court for the District of Delaware.
23. “Materials--Almost All You Wanted to Know About Practice Pointers after the Bankruptcy Reform Legislation: Avoiding the Landmines,” American Bar Association, Section of Business Law, Business Bankruptcy Fall Meeting, November, 2006; “Annual Business and Non-Business Filings by Year (1980-2005),” American Bankruptcy Institute; “The Phoenix Report: A Study of Bankruptcies in

2005-2006," PricewaterhouseCoopers Corporate Advisory and Restructuring LLC; "Business Failure Record, 1996 Final, 1997 Preliminary," Dun & Bradstreet Corporation..
24. LoPucki, L. M. and Whitford, W.C., "Patterns in the Bankruptcy Reorganization of Large, Publicly Held Companies," 78 Cornell l. Rev. 597, 1993.
25. LoPucki, L. M. and Whitford, W.C., "Bargaining over Equity's Share in the Reorganization of Large, Publicly Held Companies," 139 U. Pa L. Rev. 125, 1990.
26. Baird, D.G. and Rasmussen, R.K., "The End of Bankruptcy," 55 Stanford L. Rev., 751, 2003.
27. Baird, D.G. and Rasmussen, R.K., "Chapter 11 at Twilight," 56 Stanford L . Rev, 673, 2003.
28. LoPucki, L.M., "The Nature of the Bankrupt Firm: A Reply to Baird and Rasmussen's The End of Bankruptcy," UCLA School of Law, Law & Economics Research Papers, No. 03-10, 2003.
29. LoPucki, L.M.and Doherty, J.W., "Bankruptcy Fire Sales, Michigan Law Review [forthcoming article], 2007, at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=980585.
30. U.S. v. Nicolet, 857 F.2d 202, 3rd Cir. 1988; City of New York v. Exxon, 932 F.2d 1020, 2nd Cir., 1991. Safety-Kleen v. Wyche, 274 F.3d 846, 4th Cir, 2001.
31. "Background Document for the Financial Test & Municipal Revenue Test: Financial Assurance for Closure and Post-Closure Care," U.S. Environmental Protection Agency, Office of Solid Waste, November 30, 1981.
32. "Analysis of Potential Self-Guarantee Tests for Demonstrating Financial Assurance by Non-Profit Colleges, Universities, and Hospitals and by Business Firms That Do Not Issue Bonds," NUREG/CR-6514, ICF Incorporated, March 1997.
33. "Statement of Financial Accounting Standards No. 141: Business Combinations," Financial Accounting Standards Board, June 2001; "Statement of Financial Accounting Standards No. 142: Goodwill and Other Intangible Assets," Financial Accounting Standards Board, June 2001. Foster, B.P., Fletcher, R., & Stout, W.D., "Valuing Intangible Assets: Establishing Practices in an Emerging Area," CPA Journal, February 2006.
34. Standard & Poor's, Corporate Ratings Criteria, 2006; Standard & Poor's, "Annual 2005 Global Corporate Default Study and Rating Transitions," January 2006; Moody's Investors Service, "Default and Recovery Rates of Corporate Bond Issuers, 1920 -2005," March 2006; Securities and Exchange Commission, Notice of Proposed Rulemaking, "Definition of Nationally Recognized Statistical Rating Organizations," 78 FR 21306, April 25, 2005.
35. Franke, N.A., "Secret Liens, Trusts, and Other Threats to Collateral," Debt3. Commercial Law League of America.
36. Nuclear Regulatory Commission (U.S.), "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," NUREG/BR-0058, Revision 4, September 2004.
37. Nuclear Regulatory Commission (U.S.), "Consolidated NMSS Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria," NUREG-1757, Volume 2, Revision 1, September 2006.
38. Nuclear Regulatory Commission (U.S.), "Regulatory Analysis Technical Evaluation Handbook, Final Report," NUREG/BR-0184, January 1997.
39. Environmental Assessment for Proposed Rulemaking - Decommissioning Planning, September 2007 [ML071740003].
40. Nuclear Regulatory Commission (U.S.), "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," NUREG-0586, August 1988.
41. Nuclear Regulatory Commission (U.S.), "Consolidated NMSS Decommissioning Guidance: Financial Assurance, Recordkeeping, and Timeliness," NUREG-1757, Volume 3, September 2003.

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.

References

NUREG/CR-5512, vol. 1. Residual Radioactive Contamination from Decommissioning, Technical Basis for Translating Contamination Levels to Annual Total Effective Dose Equivalent, Final Report, Vol. 1, October 1992.

NUREG/CR-5512, vol. 1. Residual Radioactive Contamination from Decommissioning, Parameter Analysis, Vol. 3, October 1999.

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)	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	$7,200	$7,200
							TOTAL	$2,207,600	$1,685,971

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 $19 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 $19 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 $19 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
							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.	3	4	120	$480	$1,440	$720	$8,595	$6,558
50.82(a)(8)(v)	Submit annual financial assurance status reports to NRC.	3	8	120	$960	$2,880	$1,440	$17,191	$13,115
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.	3	8	120	$960	$2,880	$1,440	$17,191	$13,115
							SUBTOTAL	$42,977	$32,788
							+ one-time costs	$0	$0
							TOTAL	$42,977	$32,788

Notes: 1. An estimated 3 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	$19,200	$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)(1)	Requires assessment of whether occurrence of four specified events requires revision	0	16	120	$1,920	$0	$0	$0	$0
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 quarterly basis, replenish funds and notify NRC of funding shortfalls.	1	4	120	$480	$480	$480	$5,730	$4,372
72.50(b)(3)	Requires application for transfer of license to include specified info	0				$0	-	-	-
							SUBTOTAL	$5,730	$4,372
							+ one-time costs	$0	$0
							TOTAL	$5,730	$4,372

Notes: 1. An estimated 1 licensee per year monitors financial assurance funds on a quarterly basis [72.30(g)].

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 proposed 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 proposed 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 as required by the proposed rule. 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. Tables B-2 and B-3 provide estimates of the costs associated with these two alternative approaches by licensees to complying with the 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 proposed 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 proposed 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. A conservative 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 Proposed Rulemaking-Decommissioning Planning

Draft for Comment

U.S. Nuclear Regulatory Commission
September 2007

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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 Nuclear Regulatory Commission (NRC) is proposing to revise 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 in decommissioning status with complex issues 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 proposed in this rulemaking 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 proposed rulemaking 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 rely more on storing waste, perhaps in settling ponds, than in shipping waste, to save money. Storing the waste on-site could increase the opportunity for environmental contamination from pond releases. Such releases could result in substantially higher site remediation costs, possibly exceeding available financial resources, at the time of facility decommissioning.

1.2 Need for the Proposed Action

The proposed action is intended to reduce the likelihood of future legacy sites among current operating facilities. Survey and related requirements would be amended to ensure that significant residual radioactivity is detected in a timely manner, and financial assurance regulations would be amended to ensure that adequate decommissioning funds will be available when needed.

1.3 Proposed Action (Alternative 2: Monitoring with Proposed Financial Assurance Changes)[1]

The proposed 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 would contain the "residual radioactivity" term, which serves to reinforce the intended linkage between these provisions. These proposed 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). 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 proposed amendments to §§ 20.1406(c) and 20.1501(a). Based on review of the technical basis information supporting this proposed rule, licensees that would not be affected by the amendments include nuclear power plants, research and test reactors, uranium fuel fabrication plants, critical mass licensees, uranium

[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.

enrichment plants, UF6 production plants, uranium mills, solution mining facilities, sewage treatment plants, and byproduct material plants that are not rare earth extraction facilities.

For power reactors, onsite monitoring programs are being implemented to comply with 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. NRC staff has issued a revised baseline inspection module (Procedure 71122.01) used to inspect leaks and spills at power reactor sites.

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 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 certified under 10 CFR Part 76. 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 their production processes and are not, at this time, thought to pose risks of subsurface contamination.

NRC staff estimates that 1 rare earth and extraction material licensee and 4 Agreement State rare earth and extraction material licensees will be affected by the proposed amendments to 10 CFR 20.1406(c) and 20.1501. Therefore, for the purpose of this EA, the proposed action would only affect these 5 hypothetical licensees.

2.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

Under the proposed action, the new § 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) is being revised by replacing its undefined term "radioactive material" with "residual radioactivity" which includes subsurface contamination within its scope and provides a link with new 10 CFR 20.1406(c). Together, the amended 10 CFR 20.1501(a) and 20.1406(c) identify that compliance with 10 CFR Part 20 survey and recordkeeping requirements may be a necessary part of effective planning for decommissioning as well as to demonstrate compliance with effluent dose limits. 10 CFR 20.1501(b) is being added to require licensees to retain records from surveys of subsurface residual radioactivity with records important for decommissioning.

The Statements of Consideration and draft guidance released with the proposed 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 purposed of this EA it is assumed that five licensees will be affected by this proposed rulemaking. 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 proposed action 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 as low as reasonably achievable (ALARA). Monitoring will allow the licensees to be more cognizant of subsurface contamination. Licensees choosing to remediate contamination in the near-term, as the result of identifying contamination and preventing additional contamination from occurring by complying with NRC's amended regulations, will encounter contamination levels that are lower and more manageable. This would avoid incurring higher occupational exposure rates in the future, which would occur if the contamination conditions became worse over time and increasingly more hazardous as additional amounts of contamination accumulated. Licensees may alternatively choose to provide adequate funding in response to their knowledge of the extent of any 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. Drilling and installing monitoring wells into uncontaminated aquifers can create a pathway for soil radioactivity to migrate down into the aquifer if installed incorrectly. If the wells were to create a pathway to the aquifers below, the sampling and monitoring would detect the radioactivity and remedial actions would be implemented, if warranted, preventing continued migration of radioactivity.

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, once the licensee is aware of residual radioactivity in the subsurface due to the monitoring imposed by this rulemaking, 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 ensuring that waste 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 PROPOSED ACTION

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 proposed action. 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.

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 occupational exposure during 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; whereas with the proposed action, occupational exposure may slightly increase as the time spent near contaminated areas would increase during sampling periods. The creation of additional legacy sites would require extensive regulatory oversight and large financial resources to remedy.

The no-action alternative is not the preferred option because it would not address the need to prevent the creation of additional legacy sites. 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 Proposed 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 proposed additional monitoring, planning, and reporting requirements of the proposed action would also be implemented with this alternative. Therefore, for the purposes of this EA, the environmental impacts expected with this alternative are identical to those expected with the proposed action.

4.0 AGENCIES AND PERSONS CONSULTED

The NRC staff has determined that the proposed action 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 proposing to amend 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 so that environmental impacts would be considered 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 Proposed Rulemaking - Decommissioning Planning, September 2007.

Referenced SECY and SRM Documents

The title and ADAMS accession number are listed below for each of the SECY and SRM documents referenced in the Decommissioning Planning proposed rule Commission Paper and Federal Register notice. The order of the list is in the order of appearance in the document.

Documents referenced in the Commission Paper

SRM-SECY-03-0069	STAFF REQUIREMENTS – SECY-03-0069 – RESULTS OF THE LICENSE TERMINATION RULE ANALYSIS (ML033210595; 11/17/2003).
SRM-02-0079	STAFF REQUIREMENTS - SECY-02-0079 – FINANCIAL ANALYSIS AND RECOMMENDATIONS TO FACILITATE REMEDIATION OF DECOMMISSIONING SITES IN NONAGREEMENT STATES (ML022940653; 10/21/2002).
SRM-01-0194	STAFF REQUIREMENTS - SECY-01-0194 – AAR MANUFACTURING GROUP, INC., AND PROPOSED USE OF UNIMPORTANT QUANTITIES OF SOURCE MATERIAL IN 10 CFR 40.13(A) AS DECOMMISSIONING CRITERIA (ML021690563; 6/18/2002).
SECY-03-0069	RESULTS OF THE LICENSE TERMINATION RULE ANALYSIS (ML030800158; 5/2/2003).
SRM-SECY-04-0031	STAFF REQUIREMENTS - COMSECY-04-0031 – RULEMAKING TO REVISE THE LICENSE TERMINATION RULE (ML041660079; 6/14/2004).
SECY-06-0226	2006 ANNUAL UPDATE: PROGRESS AND FUTURE PLANS FOR DECOMMISSIONING SITES WITH INADEQUATE FINANCIAL ASSURANCE (ML062540061; 11/17/2006).

Documents referenced in the *Federal Register* Notice

SRM-SECY-89-224	Staff Requirements Memorandum Regarding SECY-89-224 - Determining Need for Discussions with Environmental Protection Agency (EPA) on Use of Superfund (ML051580691; 8/22/1989).
SRM	STAFF REQUIREMENTS - BRIEFING ON NRC ACTIONS FOR CLEANUP OF CONTAMINATED SITES UNDER NRC JURISDICTION (ML010100196; 1/31/1990).
SRM-01-0194	See above.
SECY-03-0069	See above.
SRM-SECY-03-0069	See above.