

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 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.

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

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
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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

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