

STATUS OF THE U.S. NUCLEAR REGULATORY COMMISSION'S DECOMMISSIONING PROGRAM

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ABSTRACT

On July 21, 1997, the U.S. Nuclear Regulatory Commission (NRC) published the final rule on Radiological Criteria for License Termination (the License Termination Rule or LTR) as Subpart E to 10 CFR Part 20. NRC regulations require that a materials licensee submit a Decommissioning Plan to support the decommissioning of its facility, if it is required by license condition, or if the procedures and activities necessary to carry out the decommissioning have not been approved by NRC and could increase the potential health and safety impacts to the workers or the public. NRC regulations also require that reactor licensees submit Post-shutdown Decommissioning Activities Reports and License Termination Plans to support the decommissioning of nuclear power facilities. This paper provides an update of the status of NRC decommissioning program. It includes: 1) an overview of the evolution of the NRC's decommissioning program over the past 10 years; 2) the current status of the decommissioning of power and test and research reactors, complex materials sites, uranium recovery sites and fuel cycle facilities; 3) the status of various tools and guidance the NRC is developing to assist licensees during decommissioning; and, 4) the current efforts to improve the decommissioning process, including the elimination of the Site Decommissioning Management Plan, mixing of contaminated soil to meet cleanup levels, and the follow-on activities associated with the staff's evaluation of the implementation of the License Termination Rule.

INTRODUCTION

To "decommission" is defined in NRC regulations at 10 CFR 20.1003 as "to remove a facility or site safely from service and reduce residual radioactivity to a level that permits 1) release of the property for unrestricted use and termination of the license; or, 2) release of the property under restricted conditions and termination of the license [1]." NRC regulations at 10 CFR Part 20, Subpart E [2] describe the criteria for the release of decommissioned sites for unrestricted and restricted use, and apply to most NRC licensees.

For power reactor licensees, NRC regulations at 10 CFR Part 50 [3] require that, prior to, or within 2 years following permanent cessation of operations, they provide NRC with a post-shutdown decommissioning activities report (PSDAR). The purpose of the PSDAR is to provide NRC and the public with a general overview of the proposed decommissioning activities. 10 CFR Part 50 also requires that nuclear power reactor licensees submit a License Termination Plan (LTP) at least 2 years before termination of the license. The purpose of the LTP is to describe the radiological condition of the site, provide a dose assessment for the site, identify the remaining decommissioning activities, and provide the final survey plan for the site.

For materials licensees, NRC regulations at 10 CFR Parts 30, 40, 70, and 72 require that a Decommissioning Plan (DP) be submitted to support the decommissioning of its facility, if it is required by license condition, or if the procedures and activities necessary to carry out the decommissioning have not been approved by NRC and could increase the potential health and safety impacts to the workers or the public. The objective of the decommissioning plan is to describe the activities and procedures that the licensee intends to undertake to remove residual radioactive material at a facility to levels that meet NRC criteria for release of the site and termination of the radioactive materials license. Beginning in 2004, any materials site that would be required to submit a DP is referred to in the Decommissioning Program as a “complex” site.

Background

The NRC decommissioning program encompasses decommissioning of all NRC licensed facilities, ranging from the termination of routine licenses for sealed source users to the closure of complex materials sites and reactor facilities. Approximately 300 materials licenses are terminated each year. Most of these license terminations are routine and the sites require little, if any, remediation to meet the NRC unrestricted release criteria. However, some present technical and policy challenges which will require large expenditures of NRC staff resources, including a few complex materials sites that have requested license termination under the restricted-use provisions of 10 CFR 20.1403 [4]. For example, site-specific dose assessments, including complex groundwater modeling, will be required for some sites. At other sites requesting release with restrictions on future site use, “durable institutional controls,” as specified in 10 CFR 20.1403(e), [5] will need to be provided to ensure protection of the public health and safety. Currently, there are 20 nuclear power reactors, 17 research and test reactors, 43 complex decommissioning materials facilities, 3 fuel cycle facilities, and 14 uranium recovery facilities that are undergoing non-routine decommissioning or are in long-term safe storage, under NRC jurisdiction.

Decommissioning program activities include: 1) developing regulations and guidance to assist the NRC staff and the regulated community; 2) conducting research to develop data, techniques, and models used to assess public exposure from the release of radioactive material resulting from site decommissioning; 3) reviewing and approving DPs and LTPs; 4) reviewing and approving license amendment requests; 5) inspecting licensed and non-licensed facilities undergoing decommissioning; 6) developing environmental assessments (EAs) and environmental impact statements (EISs) to support the NRC’s reviews of DPs and LTPs; 7) reviewing site final status survey reports; and 8) conducting confirmatory surveys.

The NRC decommissioning program is administered through NRC’s Offices of Nuclear Material Safety and Safeguards (NMSS), Nuclear Reactor Regulation (NRR), and Nuclear Regulatory Research (RES), as well as the Regional Offices. Because of the cross-Agency nature of the decommissioning program, the staff has taken several actions to ensure that decommissioning activities are integrated and coordinated within the Agency, including tracking decommissioning activities in the Agency Operating Plan, preparing an annual Agency-wide decommissioning report, and providing management oversight and coordination of decommissioning activities and policies through a Decommissioning Management Board.

Evolution of the Complex Decommissioning Program

There have been many catalysts for change in the NRC's Decommissioning Program over the past several years. Fiscal constraints, such as the need to reduce budgeted resources in the decommissioning program, as well as concerns over the time taken to work through the decommissioning process have led to actions to improve the program and use resources more efficiently. In addition, NRC's Strategic Plan [6] requires the NRC staff identify and implement improvements to NRC's programs in order to improve efficiency, effectiveness, and openness while maintaining the necessary focus on safety. The LTR itself, and more recently the analysis of several issues associated with implementing the LTR, have been significant catalysts for evolution of the decommissioning program. Finally, under the Government Performance Results Act of 1993 [7] federal agencies are required to schedule, conduct and report on program evaluations in specific areas. These catalysts have resulted in a program that is focused on the management of complex sites in a consistent, risk-informed manner as opposed to a program that is focused on sites that are deemed to be problem sites.

In the past NMSS managed the decommissioning of complex materials sites with the focus on Site Decommissioning Management Plan (SDMP) sites, while power reactors were managed in NRR. In 2003 NRR and NMSS completed an effort to transfer decommissioning power reactors from NRR to NMSS earlier in the decommissioning process because the agency recognized that these facilities were more akin to contaminated materials sites than operating power plants. In 2004 NMSS eliminated the SDMP and is now managing all complex sites (i.e., materials sites that need to submit a DP and power reactors that will submit an LTP) under a Comprehensive Decommissioning Program. On June 17, 2004, the elimination of the SDMP designation was announced in the *Federal Register* (69 *Federal Register* 33946).

In the past, NRC staff used the SDMP Action Plan criteria which were concentration-based criteria without a specific dose-basis. These criteria were implemented through guidance, because the NRC had not promulgated a rule for the cleanup of nuclear sites. Absent an exemption from the Commission, no option other than unrestricted use was available to licensees. Now staff uses the LTR which is a dose-based, all pathways approach. The rule presents a risk-informed, performance-based, graded approach that includes both restricted and unrestricted options and additional options for the use of alternate criteria under certain conditions.

In the past, staff relied on over 80 decommissioning guidance documents for implementing the decommissioning program. In September 2003 the staff completed a 3-year effort to update, consolidate and risk-inform all materials decommissioning guidance into NUREG-1757 "NMSS Consolidated Decommissioning Guidance" [8] and NUREG -1700 "The Standard Review Plan for Power Reactor License Termination Plans" [9]. Because both licensees and the staff will have a complete set of guidance, this should result in greater consistency and quality of submitted information and reduce the number and type of requests for additional information (RAIs). This guidance will be updated in 2005.

The process that the staff employs in its execution of the decommissioning regulations and guidance also has seen substantial change. For example, in the past staff conducted a 30-day

acceptance review of DPs and LTPs to determine if the submissions were suitable for detailed technical review. Because the staff was not able to fully evaluate the information submitted in the DP or LTP, this approach often resulted in multiple sets of RAIs in order for the staff to obtain all the information necessary to complete the review. Now the NRC staff performs a 90-day DP/LTP acceptance review that focuses on key technical/financial components of a DP or LTP, to identify “fatal flaws” in the DP/LTP, to reject substandard DPs/LTPs and to communicate review results with licensees. This approach has resulted in a reduction of the in staff/licensee effort to achieve an acceptable product.

Additionally, in the past, the reviews themselves were essentially reactive in character, i.e., NRC waited for the licensee’s submittal of a DP or LTP, and then developed RAIs, with limited communication between the staff and the licensee. Now the staff uses a proactive review of decommissioning documents, including pre- LTP RAI development meetings to focus licensees on where NRC staff has seen inadequacies in other submittals and frequent progress meetings during LTP review and subsequent cleanup.

In the past, the NRC staff typically defaulted to a conservative post decommissioning land use scenario, such as a resident farmer, if dose modeling was used at a site. In addition, the NRC staff based decisions on scenarios using a 1000 yr time horizon. Now, based on the Commission’s direction in the SRM for SECY -03-0069 [10] NRC is using more realistic post decommissioning land use scenarios, based on 10 - 100 years and developed in conjunction with consultations with local planners/stakeholders.

In the past there was limited stakeholder outreach which was typically focused on SDMP sites. Now guidance & site-specific communication plans have been developed for all complex decommissioning sites. These plans will soon be available on the NRC Decommissioning Website to allow interested individuals to review the plans and determine how and when they will interact with the staff during the decommissioning process.

Power Reactor Status

NMSS currently has regulatory project management responsibility for 15 decommissioning power reactors. NRR has project management responsibility for two decommissioning reactors (Indian Point – Unit 1, Millstone – Unit 1) because extensive stakeholder interest in these sites (for both the operating and decommissioning units) makes it more efficient for NRR to perform, as a single point of contact, project management responsibilities for the permanently shutdown units. In addition, NRR has project management for three decommissioning early demonstration reactors—Vallecitos, Nuclear Ship Savannah, and Saxton. The staff currently is reviewing the LTPs for Big Rock Point (submitted in April 2003) and for Yankee Rowe (submitted in November 2003). The Trojan and Maine Yankee plants are nearing the completion of decommissioning and are expected to complete decommissioning and request license termination in 2005.

Research and Test Reactor Status

NRR provides project management and inspection oversight for 17 decommissioning research and test reactors. Currently, 13 research and test reactors have decommissioning orders or amendments. Additionally, three research and test reactors are in “possession-only” status, either waiting for shutdown of another research or test reactor at the site, or for removal of the fuel from the site by the U.S. Department of Energy (DOE). One research and test reactor is preparing to submit a decommissioning amendment request. Further, 3 of the 13 research and test reactors with decommissioning orders or amendments, and 1 of the 3 research and test reactors in possession-only status still have fuel in storage at the reactor.

Complex Decommissioning Materials Facilities Status

On June 17, 2004, the staff published a Notice in the *Federal Register* (69 *Federal Register* 33946) to announce that NRC has decided to eliminate the SDMP designation for sites and manage the SDMP sites as “complex sites” under a comprehensive decommissioning program. Currently, there are 43 complex decommissioning materials facilities. In FY 2004, four sites were removed from the complex site list: (1) Babcock & Wilcox – Parks Township; (2) Envirotest Laboratories; (3) Molycorp, Inc. – York; and (4) University of Wyoming. Three sites have been removed from the list in FY 2005: (1) ATK/Alliant Technologies; (2) Englehard Minerals-Ravena; and, (3) Kiski Valley Water Pollution Control Authority.

NRC completed its evaluation of formerly licensed sites under the Oak Ridge National Laboratory (ORNL) Terminated License Review Project in September 2001 [11]. As a result of the ORNL review, and subsequent follow-up by the Regions, 42 formerly licensed sites were found to have residual contamination levels exceeding NRC’s criteria for unrestricted release. After successful remediation, 20 of these sites have been closed, and 11 have been closed by transfer to Agreement States or a Federal entity for closure under their oversight programs. Eleven sites remain open and are managed as complex decommissioning materials facilities.

In calendar year (CY) 2004, the DWMEP staff continued to implement its comprehensive integrated plan for successfully bringing complex decommissioning sites to closure. Site status summaries are maintained, for each complex decommissioning site. These summaries describe the status of each site and identify the current technical and regulatory issues impacting completion of decommissioning. The staff also maintains schedules (Gantt charts) for each site, which are updated quarterly, to guide the management of decommissioning activities. The Gantt charts identify all major decommissioning activities and schedules for completion. For those licensees that have submitted a decommissioning plan (DP), the schedules are based on an assessment of the complexity of the DP review. For those licensees that have not submitted a DP, the schedules are based on other licensee information available and the anticipated decommissioning approach. To date, 6 of the 43 complex decommissioning sites have not yet submitted DPs, and NRC is currently reviewing 10 DPs.

Uranium Recovery Facility Status

NMSS provides project management and technical review for decommissioning and reclamation of facilities that are regulated under 10 CFR Part 40, Appendix A [12]. These licensees include conventional uranium mills and in situ leach (ISL) facilities. Currently, there are 14 NRC-licensed [Uranium Mill Tailings Radiation Control Act (UMTRCA) Title II] [13] sites in decommissioning. NRC recently approved a request from Utah to amend its Agreement under Section 274 of the Atomic Energy Act [14] to assume regulatory authority over certain additional radioactive material within the State. Effective August 16, 2004, NRC transferred to Utah the responsibility for licensing, inspection, enforcement, and rulemaking activities for uranium and thorium milling operations and mill tailings and other wastes, known as 11e.(2) byproduct material. Two decommissioning UMTRCA Title II sites were thus transferred to Utah: Plateau Resources – Shootaring Canyon and Rio Algom – Lisbon.

Fuel Cycle Facility Status

NMSS provides licensing oversight and decommissioning project management to fuel cycle facilities, including conversion plants, enrichment plants, and fuel manufacturing plants. Most of these facilities have been in operation for 20 or more years. As technology improves and operations at these facilities change, there are often unused areas on the site with residual contamination. The NRC staff continues to work closely with the States and EPA to regulate remediation of unused portions of operating fuel cycle facilities. In 2004, one conversion facility (Honeywell) and two fuel manufacturers (Framatome Richland and General Atomics) continued some decommissioning activities, although all are still operating.

Guidance and Rulemaking Activities

In previous years, the staff considered broad-scope regulatory improvements for decommissioning nuclear power plants in the areas of security, emergency planning, and insurance. However, because of continuing efforts by the staff to reassess vulnerabilities and redefine the threats in the area of safeguards and security, the priority for decommissioning regulatory improvements for decommissioning reactors has been reduced. A relatively small number of nuclear power plants are undergoing decommissioning, and the staff does not anticipate additional nuclear power plants decommissioning in the near future. Given the absence of any additional, anticipated nuclear power plant decommissionings, and the uncertainties related to safeguards and security regulation, resources are being deferred for certain nuclear power plant decommissioning rulemakings. Resources for nuclear-power-plant decommissioning rulemakings that are not currently in progress or related to security matters are not included in the FY 2005 or FY 2006 budgets. If any new plants do unexpectedly shut down permanently, decommissioning regulatory issues would continue to be addressed through the amendment and exemption process in a manner similar to the current practice.

In SECY-03-0069 (Results of the License Termination Rule Analysis), [10] staff recommended, in part, that the Commission approve a new rulemaking to reduce the potential for future decommissioning problems (i.e., future legacy sites) by adding and revising requirements for

financial assurance and licensee monitoring, reporting, and remediation. In an SRM dated November 17, 2003, [15] the Commission approved the rulemaking. The current schedule requires that the staff complete the proposed rule in FY 2006.

In October 2002, the Commission directed the staff to conduct an enhanced participatory rulemaking on the disposition of solid materials. Currently, the staff is considering comments received from stakeholders in letters and e-mails and collected at the public workshop held on May 21–22, 2003; reviewing relevant standards and documents; and maintaining awareness of efforts being conducted by State, Federal, and international organizations. The staff is preparing a generic environmental impact statement (EIS) that evaluates impacts and costs of various alternatives and developing guidance for implementing the rulemaking. The current schedule is to send a rulemaking package to the Commission in March 2005 for issuance as a proposed rule for public comment.

Research Activities

The Office of Research (RES) continued to provide information to NMSS to support assessments of public exposure to environmental releases of radioactive material from site decommissioning.

RES staff has several projects underway to improve existing dose modeling codes. Enhancements to the RESRAD–OFFSITE code for modeling the potential impact due to offsite releases was provided to licensing staff for testing, and an updated RESRAD–BIOTA code that will assess impacts to biota was provided for review and testing. In addition, RES contributed to the rulemaking effort on controlling the release of solid materials by (a) completing the assessment of collective doses for potential release strategies; (b) assessing the potential doses from reuse of released soil; (c) developing information for the analysis of conditional use of materials; (d) coordinating the review of draft International Atomic Energy Agency (IAEA) Safety Guide 161 (DS-161) "Application of the Concepts of Exclusion, Exemption and Clearance" and supporting documentation; and (e) completing draft NUREG-1761 "Radiological Surveys for Controlling Release of Solid Materials" and addressing public comments. The majority of these efforts contributed to the technical basis for the EIS for the rulemaking on controlling the release of solid materials.

RES staff also continued to support numerous interagency activities. Examples include the development of two manuals, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) [16] and Multi-Agency Radiation Laboratory Analytical Protocols (MARLAP) [17]. Each of these manuals will establish a common approach among Federal agencies for radiological measurements and surveys.

Program Improvements

The staff continues to take steps to ensure integration of decommissioning activities. First, NMSS and RES mutually track and manage decommissioning activities. Second, the Decommissioning Management Board (hereafter, the Board) meets monthly to provide management input on decommissioning activities and issues. The Board, composed of managers from NMSS, RES, NRR, and the Regions, along with the Office of the General Counsel (OGC),

serves as an effective mechanism for integrating inter-Office and inter-Regional program activities and issue resolution. The Board is a mechanism by which the staff has enhanced intra-agency communication. In addition, it ensures that NRC's regulatory processes are integrated.

The decommissioning process is becoming more efficient as the staff continues (a) assuming a more proactive role in interacting with licensees undergoing decommissioning, including conducting pre-submittal meetings with licensees; (b) using an expanded acceptance review process, to include a limited technical review, to reduce the need for additional rounds of questions; (c) ensuring that institutional controls and financial assurance requirements are adequate before beginning a technical review of a DP; (d) implementing other procedures (e.g., focused site visits to reduce the number of requests for additional information); (e) conducting inprocess or side-by-side confirmatory surveys; and (f) relying more heavily on licensees' quality assurance programs rather than conducting large-scale confirmatory surveys.

Furthermore, the staff is incorporating strategies to achieve the performance goals identified as part of the Agency's strategic planning process and Strategic Plans for FYs 2004–2009. Examples of strategies being incorporated include: (a) focusing on resolving key issues, such as institutional control for restricted release and partial site release; (b) participating in stakeholder workshops to seek licensee, industry, and public input; (c) updating, consolidating, and risk-informing (i.e., performance-orienting) decommissioning guidance; (d) working with industry to identify and resolve technical and policy issues associated with decommissioning; and (e) continuous refinement of the stakeholder database and Website.

Responding to the staff's annual decommissioning report "2003 Annual Update – Status of Decommissioning Program," [18] the Commission directed the staff to address (a) expand the focus and increasing the level of detail in the Annual Decommissioning Report with the intent of developing it as a primary communication document; (b) make other changes to the general format of the report; and (c) eliminating the SDMP designation. In early 2005 the staff will publish a NUREG document (currently, at press) that incorporates these changes. Because the annual report will contain information that is not expected to change from year to year (i.e., discussion of the materials decommissioning process), the staff will provide the report in the form of a NUREG document every two years beginning with this report. In the odd number years, the staff will publish the report as a shortened paper to the Commission, using references to the decommissioning Website.

To ensure that the Commission and the public will be able to access current information on sites undergoing decommissioning or reclamation activities, site descriptions for all sites undergoing decommissioning will be placed on the NRC Website. These site descriptions will be reviewed on a bi-monthly basis and updated as necessary to ensure that the information is current. Updates will be performed by the respective site Project Managers in NMSS, NRR and the Regions. The NUREG report will contain the most current site summaries, for each site while the off-year report to the Commission will contain the Website addresses for the sites.

Elimination of the SDMP

The SDMP was developed by the staff, in response to the Commission's direction to develop a comprehensive strategy for NRC to deal with a number of contaminated sites, so that closure on cleanup issues could be attained in a timely manner. In 1992, the staff developed the SDMP Action Plan to (a) identify criteria that would be used to guide the cleanup of sites, (b) state NRC's position on finality, (c) describe NRC's expectation that cleanup would be completed within 3–4 years, (d) identify guidance on site characterization, and (e) describe the process for timely cleanup on a site-specific basis.

Since development of the SDMP Action Plan, the staff has addressed the issues identified in the Action Plan, as follows. The criteria for site cleanup and NRC's position on finality were codified in 10 CFR Part 20, Subpart E (LTR). NRC's expectations regarding the completion of site decommissioning have been codified in 10 CFR 30.36, 40.42, 70.38, and 72.54. Issues associated with site characterization have been addressed in NUREG-1575, Rev. 1 (MARSSIM, August 2000) [16], and in NUREG-1757, Vol. 2, "Volume 2: Characterization, Survey, and Determination of Radiological Criteria, of the Consolidated NMSS Decommissioning Guidance" (September 2003) [8]. The process for timely cleanup on a site-specific basis is addressed in NUREG-1757, Consolidated NMSS Decommissioning Guidance [8].

Considering this, the staff has recently implemented the Commission's direction to eliminate the SDMP designation. On June 17, 2004, the staff published a Notice in the *Federal Register* (69 *Federal Register* 33946), to announce that NRC has decided to eliminate the SDMP designation for sites and manage the SDMP sites as "complex sites" under a comprehensive decommissioning program. Elimination of the SDMP designation and the discontinuance of the SDMP as a separate site listing is appropriate, because, as discussed above, the original intent of the SDMP and SDMP Action Plan (i.e., to achieve closure on cleanup issues so that cleanup could proceed in a timely manner) has been achieved. The SDMP sites have been incorporated into a comprehensive decommissioning program that facilitates the cleanup of routine and complex sites in a manner that is consistent with the goals of the SDMP and SDMP Action Plan.

Viewed in the context of this comprehensive decommissioning program, which includes sites previously referred to as routine decommissioning sites, formerly licensed sites, SDMP sites, non-routine/complex sites, fuel cycle sites, and test/research and power reactors, the continued use of the SDMP list did not provide the same benefits that it did when it was first developed. The NRC staff believes the cleanup of these sites is now managed more effectively as part of this larger program. As the SDMP sites are being managed as complex sites under this comprehensive program, the level of safety currently in place at SDMP sites has not been diminished. In addition, as sites are identified and managed as complex sites, and as more sites are evaluated pursuant to the comprehensive decommissioning program, common problematic technical issues should be identified more easily, and resolutions to these issues should be implemented in a more consistent manner.

Soil Mixing

In SECY-03-0069, "The Results of the LTR Analysis"[10], staff identified an additional issue requiring evaluation; the appropriateness of allowing intentional mixing of contaminated soil for

meeting the release criteria under the LTR. The results of the staff's analysis of this issue were provided in SECY-04-0035 on March 1, 2004 [19], and the Commission approved the recommendations of the staff in SRM- SECY-04-0035 [20], on May 11, 2004. The Commission approved allowing intentional mixing of contaminated soil to meet LTR release criteria in limited circumstances, on a case-by-case basis, and continuing the current practice of allowing intentional mixing for meeting waste acceptance criteria at offsite disposal facilities and for limited onsite waste disposals.

The staff will consider approving proposals from licensees to intentionally mix contaminated soil to meet the release criteria of the LTR if the following conditions are met. First, any proposed mixing of contaminated soil must be part of an overall approach which includes application of the ALARA principle, and considers cases only where it can be demonstrated that removal of the soil would not be reasonably achievable. Second, the following two technical criteria should be met: 1) The resultant area containing contamination should be equal to or less than the area of contamination present when decommissioning work begins, and; 2) clean soil, from outside the footprint of the area containing the contaminated soil, should not be mixed with contaminated soil to lower concentrations. Staff will consider approving rare cases, where the only viable alternative to achieving the dose levels of the LTR appears to be using clean soil from outside the footprint of the area containing contaminated soil.

During FY 2005 staff will develop guidance to provide assistance to licensees who may want to include mixing in their decommissioning plans for license termination in accordance with the LTR release criteria.

LTR Analysis Follow-on Actions

On May 28, 2004, the staff issued RIS 2004-08, "Results of the License Termination Rule Analysis." [21], This RIS was the first LTR Analysis follow-on action of the actions approved by the Commission in SRM-SECY-03-0069 [10]. The purpose of the RIS was to inform licensees and stakeholders of NRC's analysis of the nine issues associated with implementing the LTR; the Commission's direction to date on how they can be addressed; 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 addition, early feedback was invited on the issues in the RIS.

During FY 2004 the staff began to implement, where appropriate, options approved by the Commission for the institutional control and realistic exposure scenario issues. The progress toward implementation is summarized below, including site-specific examples.

Institutional Controls and Restricted Release

Shieldalloy Metallurgical Corporation (SMC) site: Based on the Commission's approval of options and implementation actions in SRM-SECY-03-0069 [10], and SMC's interest in using the Long-Term Control (LTC) license option, the staff developed interim guidance for the LTC license at the SMC site in New Jersey. The interim guidance, provided to SMC in May 2004, include key concepts about the use of the LTC license as well as guidance on information to

include in SMC's revised DP for institutional controls, engineering barriers, maintenance, and financial assurance. As a follow up to providing this guidance, a meeting was held in June 2004 to provide an opportunity to discuss the guidance with SMC and stakeholders. SMC plans on revising its DP using the interim guidance and submitting the DP in FY 2005 for NRC review.

AAR Manufacturing, Inc. (AAR): As discussed in SECY-03-0069 [10], the staff has been working with AAR on the institutional control option of NRC monitoring and enforcing under a legal agreement and deed restriction. During FY 2004, the staff and AAR have been working on other technical issues related to the radiological survey and dose assessment that need to be resolved before further work can be done under the legal agreement option. The staff expects that this work will continue during FY 2005 as the staff develops its draft guidance for the institutional control issue.

West Valley Demonstration Project (WVDP) site: In March 2004, the staff met with DOE staff to discuss the scope and content of the DP for DOE's West Valley Demonstration Project (WVDP). During the discussion, NRC staff presented an update to the existing DP checklist for institutional controls. DOE will need to apply the risk-informed, graded approach to institutional controls as described in SECY-03-0069 [10] to determine which parts of the site need restrictions and the types of restrictions. The party that is ultimately responsible for institutional controls will be determined in the future, as a result of the ongoing process for developing the EIS.

Realistic Scenarios

During FY 2004, the staff started to implement the realistic exposure scenario approach approved by the Commission at the following nine decommissioning sites: Kiski Valley Water Pollution Control Authority (KVVWPCA); Fansteel, Inc. (FRMI); SMC; AAR; Michigan Department of Natural Resources; SCA Services (SCA); DOW Chemical Co.; Cabot Performance Materials, Inc. (Cabot); and the WVDP. KVVWPCA and Fansteel cases are of particular interest because they illustrate cases where the Commission approved policy has been tested at specific sites and either approved by the Commission or the Atomic Safety Licensing Board (ASLB).

For the KVVWPCA site, in June 2004, the staff provided the results of its own dose assessment to support a recommendation to the Commission of no further decommissioning action (SECY-04-0102) [23]. The Commission approved the staff's recommendation for KVVWPCA, including the application of the realistic scenario approach for this site. The dose assessment included a range of potential scenarios. An onsite, no action scenario was evaluated in which the contaminated lagoon is abandoned in place with no remedial actions performed. This was considered a reasonably foreseeable land use scenario. A removal scenario was also evaluated, in which the contaminated ash is excavated and removed to an offsite disposal facility. This also was considered reasonably foreseeable, based on the position of the Pennsylvania Department of Environmental Protection (PADEP) to excavate and remove the contaminated ash. This removal and offsite disposal scenario illustrates how the potential for offsite use should be evaluated consistent with the staff's approach discussed in the LTR Analysis RIS 2004-08. This offsite use approach was discussed in the RIS, in response to the Commission direction in SRM-SECY-03-

0069 [10]. In addition to the reasonable foreseeable land use scenarios, the staff evaluated a pair of less likely cases, as assessment tools to bound the uncertainty associated with future land use.

Fansteel proposed an industrial land use scenario for dose calculation purposes. The NRC staff reviewed the proposal and evaluated land use development in the area. The site is bounded on the north by the Port of Muskogee and industrial operations, on the east by the Arkansas River, on the south by US Highway 62, and on the west by the Muskogee Turnpike. In addition, there is a coal-fired power plant across the Arkansas River. The NRC staff confirmed the Port's interest in acquiring more land from Fansteel for its operations. Based on this information, the staff concluded that industrial land use was appropriate for this site. However, the State of Oklahoma challenged that position, stating that the resident farmer should be used because there are other farms in the surrounding area. The State proposed that a recreational land use scenario be considered because the river and property across the river are used for recreation. After reviewing the issues and arguments, NRC's ASLB upheld the NRC staff's position. This decision is important because it is the first case that used the industrial scenario as a reasonably foreseeable land use, that had the approach challenged, and that was upheld by the ASLB.

Decommissioning Program Evaluation

NRC's Strategic Plan for FY 2000-2005 identified a program evaluation, *Changes to the Decommissioning Process*, to be conducted in FY 2003. On September 29, 2003, the NRC staff completed its evaluation, included a summary in NRC's Annual Performance Report, and made the final report available on NRC's Decommissioning Website. In this report the staff evaluated the effectiveness of NRC's DWMEP Decommissioning Program and recommended future improvements. The staff evaluated overall program effectiveness with (a) NRC's Strategic Plan measures and targets, (b) NMSS Operating Plan accomplishments, and (c) the Office of Management and Budget (OMB) Program Assessment Rating Tool (PART). The staff used the PART questions as an independent methodology to systematically and comprehensively evaluate its program to identify areas of the program's effectiveness that might need further improvement. The staff also evaluated the effectiveness of 18 specific changes/improvements that were made to the program during the FY 2001-FY 2003 evaluation period. Independent reviews by the Commission and the Advisory Committee on Nuclear Waste were also used and add objectivity to the staff evaluations.

The staff concluded that the Decommissioning Program has been effective in meeting the Agency's strategic and performance measures and in closing/terminating sites after completion of decommissioning. The program also has effectively used many types of self-assessments and program changes to improve the regulatory framework, decommissioning processes, internal program management processes, and openness. The staff believes these improvements have been useful and those that are ongoing should continue to be implemented. Although significant improvements have been completed, future improvements would be beneficial. In particular, the recommendations in SECY-03-0069 to resolve the LTR policy issues, when implemented as directed by the Commission, offer potentially significant future improvements for the program. To complement these regulatory and policy improvements, the Program Evaluation makes additional recommendations that primarily would improve internal program management.

During FY 2004, an Improvement Plan was prepared that combines the implementation actions related to recommendations in the Program Evaluation with the Commission approved implementation actions related to the LTR Analysis in SECY-03-0069 [10]. Some of the Program Evaluation actions were started in FY 2004 [e.g., establishing a more comprehensive Decommissioning Program; revising performance measures to be outcome oriented; and developing a risk-informed prioritization approach for managing site work).

CONCLUSION

The NRC's Decommissioning Program has undergone significant changes since its inception in the early 1990's. These changes were the result of several internal and external catalysts. Regardless of the impetus, the changes have resulted in the establishment of a program that is able to successfully manage the decommissioning of a wide variety of sites in an efficient, cost effective and risk-informed manner, address complex technical and policy issues quickly and in a manner that reduces the regulatory burden on licensees and the NRC staff, and constantly strives to identify areas for improvement while focusing on the safety significant aspects of decommissioning.

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