

NRC Decommissioning Workshop - April 20 and 21, 2005

U.S. Nuclear Regulatory Commission,
Office of Nuclear Material Safety and Safeguards,
Division of Waste Management and Environmental
Protection (DWMEP)

The Shady Grove Center
Universities at Shady Grove
Rockville, MD

April 20, 2005

Welcome/Introductions

Division of Waste Management and Environmental Protection (DWMEP) management welcomed the attendees to the workshop.

NRC's Continual Decommissioning Process Improvements – The Integrated Decommissioning Improvement Plan (IDIP)

The Deputy Director of DWMEP opened the morning presentations with a summary of the Decommissioning Program's Integrated Decommissioning Improvement Plan (IDIP). The IDIP's origins, content, issues addressed, products, and outcomes were discussed. The outcomes of this process were identified as: 1) ensuring that the Decommissioning Program is risk-informed, 2) implementing flexibility in decommissioning regulations, 3) increasing efficiency/timeliness of our reviews, and 4) documenting, preserving, and taking future advantage of present lessons learned.

Results of the License Termination Rule (LTR) Analysis

The NRC staff presented an overview of the License Termination Rule (LTR) Analysis and the planned regulatory improvements that are an important part of the IDIP. Plans for regulatory improvements were given along with opportunities for public comment. This summary provided an introduction and background for the subsequent breakout sessions that focused on many of the issues.

Introduction of IDIP Topics for Further Discussion

NRC staff participants introduced 4 topics from the IDIP that NRC is evaluating and indicated that NRC was interested in receiving feedback from participants. The four topics introduced were: (1) incentives for decommissioning, (2) improved communications, (3) finality of decommissioning (EPA/NRC MOU), and (4) alignment of NRC and Agreement State programs.

For each of the topics, NRC staff provided a brief statement of the issue that NRC was working to solve and a brief explanation of the basis that was used to include analysis of the issue in the IDIP. The participants were asked to visit the afternoon breakout session that was dedicated to these topics to provide any comments and feedback on the actions that were presented.

Following the presentation, a brief question and answer period was held. Most of the questions dealt with the subject of Finality of Decommissioning and how the NRC was implementing the Memorandum of Understanding (MOU) with EPA on Decommissioning Sites.

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Introduction to Guidance Development and Breakout Sessions

Two main guidance products were discussed by NRC staff; these were:

Introduction to NUREG-1757 Guidance

NRC staff provided an introduction to the NUREG-1757 guidance development. He briefly described the process of developing the current version of NUREG-1757, *Consolidated NMSS Decommissioning Guidance*, and the contents of the three volumes of NUREG-1757. He also described the process for updating NUREG-1757, including use of an NRC/States working group. He listed some of the key dates in fiscal year 2005 for stakeholder involvement and input.

Use of MARLAP at Decommissioning Sites

NRC staff described the Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP), which were developed in cooperation between eight Federal agencies on December 27, 2004. These protocols provide guidance and the framework for project planners, managers, technical reviewers, and laboratory personnel to ensure that radioanalytical data will meet the needs and requirements for cleanup and decommissioning activities.

The user can select those portions of MARLAP most pertinent to their needs; e.g., Vol. 1 can be useful for decommissioning project planners, managers, and decision-makers; Vol. 2 can be useful for laboratory personnel; and Vol. 3 should be useful for data analysts and data assessors. Although MARLAP is not required for regulatory compliance, it assists users in following good practices and improving the quality of their analytical data, which can result in minimizing costs.

BREAKOUT SESSIONS

Breakout Session 1: Development of Revised Decommissioning Guidance for Restricted Use, Institutional Controls, and Engineered Barriers

Introduction and Background:

The LTR includes the option for restricted use. The NRC staff summarized its regulations in the LTR that allow the restricted use option using institutional controls, as well as new NRC options. NRC staff indicated that it is preparing decommissioning guidance for each option. Attendees were invited to provide comments or suggestions for developing the guidance.

NRC Issues Associated with Restricted Use

The staff explained that attempts to implement the restricted use requirements have raised issues: (1) governments have been unwilling to accept ownership and control of private sites or an independent third party role, and (2) sustaining long-term effectiveness of institutional controls continues to be questioned.

State of Ohio's Approach to Restricted Use

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A representative from an Agreement State, from the Ohio Department of Health, Bureau of Radiation Protection, presented an overview of Ohio's approach to decommissioning and restricted use. Under its State laws, restricted release is not permitted. The license is converted to a perpetual, "possession only" license, if unrestricted release is not available.

Discussions on Restricted Use

Discussions followed the presentations that clarified some of NRC's requirements for restricted use. In response to a question on the role of other restrictions (e.g., State-imposed deed restrictions) on ground-water use, NRC responded that these would not be considered restricted use unless the use resulted in exceedance of the dose constraint (25 mRem/y). Also, the "dose cap" of 100 mRem/yr applies when assuming that institutional controls fail.

A question was raised on whether NRC would consider a site a restricted use site, if a State requests the site to use a deed restriction to prohibit use of ground water; NRC noted that it considers Federal, State, or local government ownership of the site to be durable, and Table 1 in Regulatory Issues Summary 04-008 gives examples of durable institutional controls.¹ NRC noted that there has only been one restricted release site, which was the AMAX site in West Virginia.

Discussion on the NRC Risk-Informed Graded Approach

NRC staff summarized its risk-informed framework relying on hazard magnitude and duration to select institutional controls, including types and duration of controls, tailoring specific restrictions, and subdividing a site into areas with different restrictions. In response to a question on the termination of institutional controls (e.g., an LTC license), NRC responded that the licensee must confirm at the end of the control period that sufficient radioactive decay had occurred to meet the dose constraint.

Discussion on NRC Long-Term Control License Approach

NRC staff described using an LTC license as an institutional control for restricted use in lieu of any other acceptable institutional controls. The LTC license would be the legally enforceable and durable institutional control required by the LTR, but the site license would only be amended to become the new LTC license with conditions specifying restrictions on site access and use. All the LTR restricted use requirements would still have to be met before NRC would amend the license.

Under the LTC license NRC would inspect and enforce, as needed, to ensure that restrictions on site use continue to be effective; NRC would also conduct five-year reviews for license renewal. NRC also presented an overview of its interim guidance. Key points discussed included: (1) subdividing a site and allowing reuse, (2) sustaining private ownership, (3) use of a trust fund, (4) use of robust engineered barriers to avoid active maintenance, and (5) seeking advice from affected parties.

Use of restrictions to maintain an industrial scenario was also discussed, as well as conditions for precluding the need for institutional controls.

¹ Available at URL: <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/reg-issues/2004/ri200408.pdf>
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Comments on the LTC alternative included: (2) sale of such sites would be complicated by LTC obligations, and (2) some stakeholders questioned keeping an existing site under the LTC license, even if parts of the site could be available for any use.

NRC Legal Agreement and Restrictive Covenant

NRC staff described the option of using the combination of a legal agreement and restrictive covenant (LA/RC) as an institutional control for restricted release. Under this option, the licensee/site owner and NRC would enter into a legal agreement, coupled with a restrictive covenant, which stipulates the restrictions on site use, monitoring, and reporting.

NRC clarified that the LTC license option was preferred, because the LA/RC has not been implemented or legally tested. Commenters indicated that it was unclear who has the responsibility for maintaining records under the LA/RC option; NRC responded that this would need to be negotiated in the LA/RC. Enforcement regarding a breach of the LA/RC was questioned; NRC responded that the LA/RC may be enforced by legal action in a court of appropriate jurisdiction, as well as under the Atomic Energy Act (AEA) authority.

Advice from affected parties

NRC staff discussed seeking advice from affected parties on institutional controls.² The current guidance in NUREG-1757 is procedure-oriented. The open discussion included: (1) the timing of the public involvement process and the type of information the licensee needs to share with the affected parties, (2) the need to explain the reasonably-foreseeable land use to affected parties and restrictions on adverse uses to public health and safety, and (4) early public involvement process.

Questions/comments were raised on: (1) licensees' methods to incorporate advice into their DPs; NRC clarified that the licensee is not required to reach consensus with the affected parties on the proposed institutional controls, (2) and an example of undue burdens could include prohibition of the licensee from subdividing its property to allow sale of the portion suitable for unrestricted release.

Engineered Barriers

The objective of the session was to generate feedback on revising guidance in NUREG-1757. NRC recognized a number of areas for improvement, including: (1) the risk-informed, graded approach for engineered barriers and the use of risk insights to determine how much justification/evidence is needed to support the assessment of performance, (2) the process of assessing the contribution of barriers to performance (e.g., the types of analysis that are needed to support the regulatory evaluation), (3) common types of barriers used, primary degradation mechanisms, and levels of performance consistent with current engineering practice, and (4) a summary of existing guidance that may be applicable (e.g., NUREG-1623).

Comments included: (1) whether NRC will consider that engineered barriers can change and evolve over time; NRC explained it will address the link between quantity of

² under 10 CFR 20.1403(d)

information and the importance of the engineered barriers in performance assessment, and (2) concern was expressed whether the guidance would address monitoring; NRC acknowledged its importance but the emphasis of the guidance was not on monitoring.

Breakout Session 2 - Realistic Land Use for Scenario Development

Introduction

NRC and licensee experience implementing the LTR has raised questions about perceived unnecessary conservatism in dose assessments. One significant source of potential conservatism is with selecting post-license termination land use scenarios. This issue focuses on how to select and justify scenarios for the 1000-year dose assessment for both the unrestricted release cases and restricted release, and whether more realistic scenarios can result.

Issues

The breakout session addressed the following major issues: (1) additional, more explicit guidance on the identification of realistic land uses would benefit both licensees and stakeholders, (2) there is concern that "realistic" land use selection may lead to releasing sites which should be conditional, (3) additional avenues of communication of approaches taken by other licensees should be explored, (4) a section of the website could be used to identify land use choices by licensees with links to the DPs or LTPs, and licensees should question NRC in pre-submittal meetings on similar sites, because NRC was willing to provide specific information in those cases, (5) some uncertainty was expressed regarding the means by which NRC was going to address or approve situations in which unlikely scenarios would result in doses over the limit, and concern was raised on the number of scenarios that may need to be analyzed, including potential off-site uses, and (6) the ability of NRC to approve land use scenarios prior to submittal of the DP or LTP was questioned.

General Comments:

- The possibility of dual analyses of compliance, with a short-term scenario and a longer-term scenario, was raised as a possible hybrid approach.
- Questions were raised on the use of restrictions, not associated with the radiological status of the facility, being the basis for land use scenarios (e.g., zoning).
- A question was raised on how ALARA should be incorporated into the use of realistic scenarios, in particular, what level of ALARA analysis is necessary for unlikely scenarios.
- It was identified that there is precedent in using probability weighting of scenarios for decommissioning.
- A concern was raised that non-power reactors may not be able to take advantage of the new guidance because of a lack of coordination inside NRC.

Breakout Session 3 - Financial Assurances/Changes to Prevent Future Legacy Sites

Introduction:

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The list of events that would trigger reassessment of the decommissioning cost estimate and, if necessary, adjustment of the level of financial assurance would include:

- | | | |
|---------------------------------------|--|--|
| 1) Spills | 3) Increased waste disposal costs | 7) Actual costs that exceed estimated costs during progress of remediation |
| 2) Groundwater and soil contamination | 4) Facility modifications | 8) On-site disposal |
| 3) Increased waste inventory | 6) Changes in authorized possession limits | |

General Discussion:

NRC should consider such events at license renewal; the adequacy of financial assurance should be revisited at that time. Provisions for adjustments to financial assurance should generally be addressed in guidance. Licensees should be given incentives to survey and clean up known spills during active operations. The NRC should also consider the quantities of contaminated soil, when defining the amount of financial assurance. Other incentives to timely decommissioning include lower waste disposal costs. Financial assurance for reactor and materials operations are different and should be distinguished.

Major Issues:

- Regarding parent company guarantees and/or a self-guarantee:
 - Is a certification that off-balance sheet liabilities will not adversely affect decommissioning funding required?
 - Is an independent auditor's opinion on the potential for adverse effects on decommissioning funding required due to unreported information?
- How and when should the balance of a decommissioning fund be adjusted?
- Should the parent company and other corporate subsidiaries be responsible for contribution to the cost of decommissioning if the decommissioning costs of a subsidiary licensee exceed its financial ability?

Comments included: (1) NRC would not perform audits of financial statements, but could hire a public accounting firm to do so, (2) the Sarbanes-Oxley Act precludes the need for more regulation of corporate financial reporting, (3) accumulation of funds, above requirement to cover the decommissioning cost, does allow the licensee to withdraw funds, with NRC permission, (4) NRC should not direct the investment of funds; the prudent investor standard is sufficient, (5) NRC should revise the inspection program to have inspectors check on fund balance, (6) annual monitoring and adjustment of funds would be adequate, (7) stricter licensing should be used to prevent licensees that are undercapitalized, (8) criticism was expressed at the concept that a corporation may be able to shed its responsibility to decontaminate its facility by clever reorganization of liabilities, and (8) the current reactor decommissioning fund status report does not require licensees to report figures that allow calculation of funds spent to date or how much is needed to complete the decommissioning for reactors engaged in active decommissioning activities.

Breakout Session 3 - Operating Licensee Changes To Prevent Legacy Sites

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Many of the existing decommissioning sites that NRC regulates are complex and difficult to decommission for a variety of financial, technical, or programmatic reasons. These are sites where past operational events have created the existing problems that must now be overcome, to conduct sufficient cleanup and ultimately complete decommissioning and license termination. NRC evaluated the lessons from these existing legacy sites and plans on changes to licensee operational requirements to minimize or prevent future legacy sites.

General Discussion:

The focus of the presentation was the need for additional rulemaking and guidance to preclude legacy sites in the future: (1) large volumes of contamination result from unmonitored releases to subsurface and subsequent (unmonitored) migration, primarily through ground water, (2) proposed revisions to 10CFR20.1406 included removal of "new facilities" limitations, and additional definition of "minimize contamination," and (3) regulatory guidance will be developed in parallel with rulemaking.

First steps in guidance (this FY) are: (1) identify types of sites susceptible to generating subsurface contamination, and (2) identify parameters for increased attention during NRC inspections.

Comments from workshop participants included: (1) "affordable" radioactive waste disposal would resolve most of the issues [$\$1/\text{ft}^3$ was the preferred rate], (2) current facility practices are sufficient to prevent large leaks or significant subsurface contamination, (3) during facility decommissioning, chemical contamination, not radiological, caused surprises, (4) existing environmental monitoring focuses on the off-site aspects, (5) differences between NRC and EPA requirements for ground-water contamination create "finality" problems, as well as remedial action issues, (6) industry thinks NRC has all of the enforcement tools it needs to require performance, and (7) NRC Regions do not believe NRC can currently require additional monitoring (e.g., new wells).

Breakout Session 3 - On-Site Disposal of Radioactive Materials

Introduction:

This session outlined the NRC staff review of the LTR, and the potential conflicts between LTR and other NRC requirements. Basically, 10 CFR Part 20 allows NRC to approve an on-site disposal using a dose criterion that would exceed that for unrestricted release at license termination. The three options for on-site disposals approved by the Commission provides direction to reconcile these potentially divergent situations.

Statement of Issue:

The NRC's 3 approved options for on-site disposal or burial of radioactive materials are: (1) On-site disposal using a dose criterion of a "few millirem," (2) on-site disposal using a dose criterion of 100 mRem/y with additional financial assurance to cover the cost of decommissioning the burial site for license termination, and (3) on-site disposal using 25 mRem/y, given the disposal materials are mainly short-lived, without requiring financial

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assurance for license termination if the likelihood of creating a legacy site is low (i.e., license termination is not imminent).

NUREG-1757 *Consolidated NMSS Decommissioning Guidance* is being revised to provide guidance for on-site disposals; comments from workshop participants were requested.

Participants comments:

Define "on-site disposal" to differentiate between disposal or burial and storage.

The "few millirem" terminology needed to be defined; also the radiological dose assessment scenario should be site-specific. It was asked how the "few millirem" option would apply to the cleanup of depleted uranium (DU). A decision to remediate needs a cost/benefit analysis.

Should on-site disposal of radioactive waste be retrievable?

There is little benefit to dig up deep concrete foundations of reactor buildings below the flood plain.

During the review of an on-site disposal request NRC should consider: (1) the potential for concentration of the materials, (2) the half-lives and whether the chemical and/or physical characteristics are likely to contribute to mobility or movement, (3) the likelihood that site geological features allow movement and/or ground-water contamination, (4) the water quality in the aquifer, because of undesirable characteristics such as corrosiveness, (5) the engineering evaluations could be costly, if 10 CFR Part 61 siting criteria are used for on-site disposals, and whether DOE on-site disposal criteria or practices have been reviewed - DOE uses RCRA landfills for LLW disposal.

Nuclear power plant licensees are required by 10 CFR 50.75, (reporting and record-keeping) to document spills and conduct periodic radiation surveys without having to clean up radioactive materials until decommissioning, as long as the licensee maintains control of the material. The Timeliness Rule does not apply in these cases.

It was observed that on-site disposal is contained in NRC regulations that need to be road-mapped. The FUSRAP program was suggested for possible examples for instruction or value.

It was asked whether NRC considers the combined effect of chemical constituents with respect to the ground-water plume transport. Creation of toxic gases, compounds or re-concentration of radioactive materials may result from chemical interaction.

Breakout Session 4 - Use of Intentional Mixing of Contaminated Soil

Introduction:

The Commission approved the NRC staff's policy to consider the use of intentional mixing of contaminated soil to meet the dose criteria in the LTR. NUREG-1757 will be revised accordingly.

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Discussion:

The use of intentional mixing of soil as part of the approach for decommissioning a site would be beneficial. Commenters supported the approach based on: (1) experience at current/past sites; (2) mixing occurs during excavation; (3) it is consistent with performance-oriented and risk-based regulation; and (4) it could be used to reduce uncertainty in dose assessment.

There was general agreement from attendees that reducing the "footprint" after use of mixing was beneficial. Commenters supported this part of the approach based on: (1) licensees support the idea that less contamination should remain after decommissioning; (2) the public would find the approach more acceptable; (3) increasing the footprint is dilution, and dilution should not be used solely to meet waste management goals.

Specific Comments/Issues:

- Dilution is cited as a strategy in a number of regulations in Title 10 of the CFR.
- It is difficult to model a heterogeneous source; mixing would allow a homogeneous source term to be used in modeling.
- Financial reasons should not drive reluctance to use of intentional mixing.
- ALARA must be part of the justification for using intentional mixing. Also it was pointed out that the DCGLs³ are almost always below ALARA considerations.
- Basis for intentional mixing should be based on a generic rulemaking.
- Alternative disposal solutions are needed - mixing after excavation might allow shipment to a landfill, for example, but it still is radioactive.
- Mixing may not solve any issues with respect to mixed waste requirements.
- In some States, no radioactivity is allowed in landfills, restricting it to onsite use.
- Mixing guidance should apply also to building rubble, not just to soils.

Breakout Session 5 - 20.2002 Offsite Disposal Breakout Session**Introduction:**

An overview was provided of 20.2002 authorizations, including the language in the regulations; that this provision has been in place and used for decades, what information should be in such a request, the internal staff process for reviewing such requests, and coordination with affected States.

Discussion and Issues:

The following issues were discussed in the session:

- If the material is sent to an Agreement State, does the State need to exempt it as well? The consensus was that it depends on the situation. For example, Texas accepts exemptions from other agencies, such as NRC.
- Licensees can transfer licensed materials to brokers, without a 20.2002 authorization, since the brokers are licensed under the AEA. Some waste brokers are authorized by the State to dispose of certain wastes at RCRA Subtitle D landfills.

³ DCGL is the derived concentration guideline.

- Concern was raised on the time to obtain 20.2002 approvals from the NRC.
- Waste Acceptance Criteria (WAC) – can a licensee simply comply with the WAC for a site to obtain approval for a 20.2002 authorization – NRC staff answered no.
- The issue of unimportant quantities of source material was raised.⁴ However, such materials that are licensed may not be disposed of outside of a licensed disposal facility without prior NRC approval.

Commenters indicated that it would be useful if NRC had more guidance on these authorizations. Topics to address include the following: (1) allowable dose levels, (2) State interactions, (3) scenarios for making safety assessments, (4) worst case shipments (for concentrations) and how compliance is demonstrated, (5) whether intentional mixing can be used on the waste before it is shipped, (6) information on the computer modeling codes that the staff uses for 20.2002 reviews, (7) NRC will consider including 20.2002 approvals on the NRC web site, so that licensees can take advantage of others' experience, (8) NRC should also consider the incremental risk caused by a specific approval of a 20.2002 disposal. Since RCRA cells may take large quantities of radioactive waste (such as FUSRAP and TENORM), the incremental increase in risk from a specific approval by NRC might be very small, and (9) it was noted that NUREG-1640 and NUREG-1717 include analyses of the disposal of radioactive materials and the bases for exemptions in NRC's regulations; respectively, and could be used as a basis for a licensee's request for approval under 10 CFR 20.2002. Licensees would not have to do special analyses to justify their request for approval.

Roundtable Discussion: IDIP Topics Introduced Earlier

Incentives for Decommissioning

A participant expressed concern that NMSS' efforts on the IDIP in regards to incentives, including those efforts directed at improving timeliness of NRC staff reviews, do not necessarily include NRR reviews. Further delays in the NRR review may result in the loss of disposal capacity for decommissioning waste. An example of an 18-month delay was mentioned. NRR decommissioning guidance contained in NUREG-1537⁵ is outdated, as it pre-dates the LTR, and is too brief. NRC clarified that the 24-month period starts after NRC approval of the DP.

Improved Communications

A participant stated that the turnover rate of NRC project managers is "frustrating," which makes it difficult to maintain continuity and efficiency. It was explained that recently issued staff guidance on project turnover checklists may assist new project managers in the transitions.

The **Agencywide Documents Access and Management System (ADAMS)** was considered as having limited utility; a new Web-based system would be more user-friendly. There was general consensus that posting of timely information and lessons learned on this new

⁴ Unimportant quantities are less than 0.05% by weight of uranium or thorium, and are exempt from NRC regulation.

⁵ Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, contains the guidance which the NRC uses to administer the Reactor Licensing Process.

Web site would be preferable over the existing ADAMS system which was perceived as not user friendly.

EPA's Technology Innovation Program's (TIP) "CLU-IN" Web site for hazardous waste clean-up information (see: <http://clu-in.org/>) is a good example of Web-based information sharing, particularly dealing with hazardous waste site characterization, monitoring, and remediation.

Frustration was expressed over the NRC's Sensitive Information Screening Project (SISP), which resulted in the removal of information from the public side of ADAMS (PARS) starting October 25, 2004.

NRC should use "suggestion boxes" at NRC meetings, to provide an opportunity for anonymous respondents. NRC explained that the NRC "Public Meeting Feedback Form" which was provided can be submitted anonymously by business reply mail.

NRC was asked to develop a list of Questions and Answers (Q&As) from the workshop, and to post it on the Decommissioning Workshop Web site.

Finality of Decommissioning (NRC/EPA MOU)

A participant asked why NRC has not consulted with EPA in accordance with the MOU. NRC explained that no activities have yet triggered the formal consultation process. Questions were raised on State and EPA Regional cooperation; EPA appears to have circumvented the MOU. A suggestion that an NRC permit, license, or order could be recognized as a "Federally Permitted Release" (FPR) under EPA's CERCLA regulations might provide some regulatory flexibility under CERCLA. NRC will pose this to Office of General Counsel.

Alignment of NRC and State Programs

Participants generally acknowledged a strong relationship between this issue and the issue of finality (with respect to the EPA/NRC MOU). A case of poor communication was cited regarding a decommissioning action in Michigan. This involved communication between the state environment and public health agency and the state historic preservation officer. NRC observed that responsibility for a specific state agency consultation should be clearly delineated at the beginning of the decommissioning activity.

It was noted that the term "decommissioning" is not universally understood, and may be interpreted by some state agencies, as safe deactivation without demolition.

A participant thought that periodic teleconferences to discuss the conduct of reviews and lessons learned involving the Organization of Agreement States (OAS) would be beneficial.

Decommissioning Workshop –Thursday, April 21, 2005

DECOMMISSIONING WORKSHOP: LESSONS LEARNED

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Keynote Address on Decommissioning Lessons Learned – Commissioner Jeffrey Merrifield.

On the second day of the workshop, the NRC focused its discussion on the topic of lessons learned. Commissioner Jeffrey Merrifield provided the opening remarks for the day. Some of the issues discussed by the Commissioner included: (1) the importance of identifying lessons learned, their documentation, and dissemination, (2) the importance of public involvement in this process, and (3) the challenges that some nuclear power plants have faced during the decommissioning process. Lastly, he encouraged to share negative lessons learned, in addition to the positive ones.

The morning session continued with a panel discussion on the subject. The panel consisted of members of the NRC, Fuel Cycle Facilities Forum (FCFF), Nuclear Energy Institute (NEI), Maine Yankee Atomic Power Company (MYAPCO), Westinghouse Electric Company (WEC), and Ohio Department of Health (OHDH).

The NRC representative explained the evolution of the decommissioning program over the last couple of years, from the use of a concentration-based site decommissioning management plan to a more risk-informed, dose-based comprehensive program. The focus was on insuring that lessons learned today are incorporated into the standard operating procedures of the future. The evolution of the decommissioning guidance, MOUs and regulatory procedures into a few integrated tools was addressed. Other topics in this presentation included: (1) the results of the 2003 Decommissioning Program Evaluation, and (2) how to ensure that decommissioning lessons learned are incorporated into the design and operational stages of nuclear facilities, as well as into current decommissioning activities. The involvement of stakeholders and reliance on realistic scenarios were common themes also in the guidance development stages.

The FCFF representative began by providing an overview of how the FCFF provides feedback and recommendations to the NRC on decommissioning issues and lessons learned. Specific topics addressed in the discussion were: (1) workshops, public meetings, and table-top exercises are effective ways to share lessons learned and implementation issues, (2) licensees need for greater assurance of finality during decommissioning; licensees have had uncertainties resulting from the MOU with EPA, and (3) improvement of consistency between State agencies and NRC offices when applying decommissioning requirements. Some recommendations included: (1) decommissioning should be handled in a phased approach, (2) disposal flexibility is needed with naturally occurring radionuclides, (3) joint final status surveys, and (4) decommissioning-like activities should be employed while the operating licenses are still in place.

The NEI representative discussed lessons learned in nuclear power plants and several issues that have affected the decommissioning process in the past. Some of these issues are: (1) funding, (2) scheduling and planning, (3) availability of waste disposal facilities, and (4) ground-water contamination. Some of the lessons learned and recommendations covered in this discussion included: (1) identification of key decision points in advance, (2) use of a phased approach to decommissioning, (3) use of RCRA disposal facilities for certain types of radioactive waste, (4) establishing employee/ knowledge retention techniques, and (5) planning decision framework. During the discussion, it was suggested that there is no need for new regulations; better communication was called for. A clear message was to treat operational incidents, such as spills, more seriously.

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The MYAPCO representative discussed some pre-decommissioning considerations and activities, including: (1) negotiation vs. litigation, (2) stakeholders involvement throughout the process, and (3) a comprehensive site characterization and plan. Some of the lessons learned discussed were: (1) use of specialized talent (inside and outside of the facility) for the project, (2) the scope of the non-radiological clean-up was underestimated, (3) weather should be factored early in the project, (4) the amount of work and waste tend to be under estimated, (5) the decommissioning job should be partitioned into manageable components, and (6) a heavy stakeholder outreach program was beneficial to the process.

The WEC representative provided several programmatic and guidance recommendations, including: (1) DCGLs should be submitted early in the process, preferably before the DP, (2) decommissioning should be conducted in stages, (3) improvements to the conduct of final status surveys for backfilled excavations with soil that has radionuclide concentrations less than DCGLs, and (4) the regulatory process should be changed from mass-based to risk-based in certain cases. Some lessons learned were: (1) the importance of trace contaminants in enriched uranium, and (2) the impact of low Th-232 DCGLs in the decommissioning process. Suggestions included changes to techniques and assumptions on averaging layers, defining threshold for significant contamination, conduct of FSSs and calculational assumptions.

The Ohio Department of Health (ODH) representative provided background information about Ohio's requests to become an Agreement State, as well as some aspects of its decommissioning program. Some of the lessons learned included: (1) an acceptable DP is difficult to get, (2) site scoping surveys and characterization are just the start in the path forward for decommissioning, and (3) communicate expectations to the licensees early in the process.

Afternoon Session

The afternoon session provided an opportunity for audience feedback and comments about the different presentations, as well as additional lessons learned. Some of the topics covered during the afternoon were: (1) examples of flexibility when applying the LTR during decommissioning, including: partial site cleanup, use of a phased approach during decommissioning, and additional disposal options, (2) development of subsurface DCGLs could enhance the decommissioning process without compromising safety, (3) confusion and uncertainties about the MOU between the NRC and EPA, (4) inconsistencies among regulatory agencies, (5) documentation of extent of cleanup will add credibility to the decommissioning projects, (6) there continues to be some uncertainties regarding the requirements of the LTR and the Timeliness Rule; some licensees were unaware that the LTR requires that the dose from the entire site, including previously released areas, be used for determination of the final compliance decision, (7) side by side final status surveys (FSSs) between licensees and the regulatory agencies could be more fruitful.

Some audience observations included: (1) although they were invited, no NRC nuclear power plant staff or management participated in the workshop, (2) finality is intertwined with many other complications; e.g., inconsistencies between NRC & EPA, NRC and NRC Regional Offices, NRC and the States, (3) it was recommended that in the design of a

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characterization survey, one should design it not only with the end in mind, but with the process in mind, (4) there continue to be problems associated with using the public accessible ADAMS system, and (5) some industry representatives suggested more narrowly focused workshops in the future.

The meeting wrapped up with a discussion on the process of identifying, immortalizing and incorporating lessons learned.

The meeting concluded with an NRC representative who restated the purpose and outcomes of the Workshop, and the next steps regarding lessons learned.

Parking lot of lessons learned:

1. There are negative lessons learned which are useful in avoid the repetition of mistakes
2. It is better to factor decommissioning considerations early in the site or facility conceptual and operational design periods.
3. It was emphasized that the guidance needs to be flexible and not prescriptive because of the site-specific nature of many of the problems.
4. Licensees are encouraged to involve staff and stakeholders early in the process to reduce inefficiencies in submitting the documentation.
5. Better planning will shorten the period of time to complete decommissioning.
6. Decommissioning funds should be used in an efficient manner; this would facilitate expedient reuse of the site in an appropriate manner
7. Early identification of sites that potentially may have financial difficulties in decommissioning
8. Strong public outreach is vital; perception of inconsistencies erodes stakeholder confidence.
9. In the design and construction phases, it was noted that better access to structures and equipment facilitate later decommissioning.
10. Although phased decommissioning may be an beneficial approach, approval and coordination with NRC can avoid regulatory complications in later stages.
11. Use of RCRA, subtitle D disposal facilities should be considered for certain types of radioactive waste.
12. Better communication may limit the need for new regulation.
13. In the design of a characterization survey, one should design it not only with the end in mind, but with the process in mind.

**SUMMARY OF PUBLIC COMMENTS
FROM NRC FORM 659
(12 comment forms received)**

**DECOMMISSIONING WORKSHOP
APRIL 20 - 21, 2005
Shady Grove Center
Rockville, MD**

1. How did you hear about the meeting?

NRC Webpage	3
NRC Mailing List	5
Newspaper	0
Radio / TV	0
Other	4 (All 4 were personal contacts by an NRC employee)

2. Were you able to find supporting information prior to the meeting?

Yes	11
No	0
Somewhat	0
(No Answer)	1

3. Did the meeting achieve its stated purpose?

Yes	10
No	0
Somewhat	1
(No Answer)	1

Some specific comments:

Pro - (Yes) "*and more*"

"Excellent workshop. One of the best I've attended."

"Overall, worthwhile and timely."

"NRC did an outstanding job with this meeting. It has been the best (most useful and most informing) meeting at NRC I have attended."

"Very good, excellent workshop."

"Excellent workshop."

Con - *"On second day, morning session, the emphasis was on reactor decommissioning. Informally, I believe most of the attendees were more interested in the materials side."*

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4. Has this meeting helped you with your understanding of the topic?

Yes	11
No	0
Somewhat	1
(No Answer)	0

Pro - *"I got several valuable nuggets from the meeting."*

"I learned a lot and have a better understanding in regulations and guidance of decommissioning."

"I was also happy to receive information about MARLAP."

Con - *"A breakout session on addressing dual regulated sites would be helpful (i.e., RCRA/NRC/FUSRAP)"*

"More presentations from industry and less from NRC staff would have improved the conference."

"At least one of the breakout sessions covered multiple topics, and most people (I think) weren't interested in all of them. Might make it more focused."

5. Was the meeting starting time, duration, and location reasonably convenient?

Yes	10
No	1
Somewhat	1
(No Answer)	0

Some specific comments:

Pro - (Yes) *"and more"*

"Excellent location / facilities."

Con - *"Breakout sessions did not allow participation in all subjects of interest."*

"The room for the General Sessions was too small. Sitting on the outer edges of the rows one could not see the projected presentations on the screen."

"I wished to attend some breakout sessions that took place simultaneously in different locations."

"As in many meetings like this, there seemed to be insufficient time to fully address some of the tougher issues."

6. Were you given sufficient opportunity to ask questions or express your views?

Yes	11
No	0
Somewhat	1
(No Answer)	0

Some specific comments:

Pro - *"Thanks for your willingness to entertain my comments/questions."*

Con - *"The roundtables were more valuable for exchanging information than the large room forum used on Day 2."*

"Not enough time for questions."

7. Are you satisfied overall with the NRC staff who participated in the meeting?

Yes	12
No	0
Somewhat	0
(No Answer)	0

Some specific comments:

Pro - (Yes) - *"Extremely"*

"Access to staff members was great and all were helpful."

"I continue to be amazed at the caliber and professionalism of the NRC."

Other General Comments included on the forms:

Pro - *"I applaud the NRC's continued drive to improve its decommissioning program."*

"I hope you have future workshops on D&D as we evolve in practice and execution."

"You should conduct (a workshop) at least once a year."