

POLICY ISSUE
(Notation Vote)

May 2, 2003

SECY-03-0069

FOR: The Commissioners

FROM: William D. Travers
Executive Director for Operations /RA/

SUBJECT: RESULTS OF THE LICENSE TERMINATION RULE ANALYSIS

PURPOSE:

To provide the Commission with the results of the staff's analysis of issues associated with implementing the U.S. Nuclear Regulatory Commission's (NRC's) License Termination Rule (LTR). These results include evaluations of relevant information, recommended options to resolve each issue, recommended regulatory actions, and a schedule and resource estimate for completing the actions.

SUMMARY:

This paper provides the results of the Commission-directed analysis of LTR issues, with particular emphasis on resolving the restricted release and alternate criteria issue. The staff also evaluated other issues dealing with the relationship of the LTR release limits to other release limits, realistic exposure scenarios, measures to prevent future legacy sites, and intentional mixing. The staff proposes a variety of actions to address these issues including: 1) a rulemaking for measures to prevent future legacy sites; 2) revised guidance to support the rulemaking and to clarify restricted release, on-site burials, and realistic exposure scenarios; 3) revised inspection procedures and enforcement policy to enhance monitoring, reporting, and remediation to prevent future legacy sites; and 4) a Regulatory Issue Summary (RIS) to inform a wide range of stakeholders about the LTR analysis of each issue, Commission direction, and

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actions planned to resolve each issue. Finally, during the staff's briefing to the Commission on March 3, 2003, the Commissioners expressed an interest in the reactor decommissioning process and lessons learned implementing this process. The staff will provide this information to the Commission in the annual status report on the decommissioning program.

BACKGROUND:

The staff experience with the LTR has revealed some important implementation issues impacting the decommissioning of sites. The Commission directed the staff, in a June 18, 2002, Staff Requirements Memorandum, SECY-01-0194, to conduct an analysis of LTR issues, with particular emphasis on resolving the restricted release and institutional control issues and thus making the LTR provisions for restricted release and alternate criteria more available for licensee use. On October 1, 2002, the staff provided the Commission with an initial analysis that described the scope of each issue and the staff's plans for evaluation (SECY-02-0177).

DISCUSSION:

1. Evaluation Process

The staff conducted the planned evaluations for the eight issues identified in SECY-02-0177 and identified one new issue and associated plans for future evaluations. The issues evaluated in the nine attachments are:

- Restricted release/alternate criteria and institutional controls (Attachment 1)
- Relationship between LTR release limits and other release limits
 - Unimportant quantities under 10 CFR 40.13(a) (Attachment 2)
 - Appropriateness of developing a separate uranium/thorium unrestricted release standard (Attachment 3)
 - On-site disposal under 10 CFR 20.2002 (Attachment 4)
 - Controlling the disposition of solid materials (Attachment 5)
- Realistic exposure scenarios (Attachment 6)
- Measures to prevent future legacy sites
 - Changes to financial assurance (Attachment 7)
 - Changes to licensee operations (Attachment 8)
- Appropriateness of allowing intentional mixing (new issue) (Attachment 9)

The staff's evaluations considered a wide range of relevant information and experience from other NRC programs and regulations, as well as external sources, such as the U.S. Environmental Protection Agency (EPA); U.S. Department of Energy (DOE); Agreement States; and National Research Council reports. Similarly, extensive coordination among NRC staff was conducted to gain further information and perspective, as well as to identify interrelationships among the individual issues.

The staff's evaluations also identified options to resolve the issues, evaluated their pros and cons, and used these results to recommend specific options. The full range of regulatory tools to implement the options was considered, including: rulemaking; guidance; inspection procedures; enforcement guidance; and informational tools such as a RIS.

2. Summary of Evaluation Results

Results for three of the nine issues are summarized below. These three issues are summarized in view of recent heightened Commission interest on these important topics. Detailed results for each of the nine issues are given in Attachments 1-9, and a combined set of recommendations for all the issues is provided in Attachment 10. The potential applicability of these recommendations to the existing and future decommissioning sites is shown in Attachment 11. Attachment 11 indicates that the recommendations for realistic scenarios, financial assurance, and to some extent restricted release, have the potential to provide significant benefit to the implementation of the LTR issues.

a. Restricted Release/Alternate Criteria and Institutional Controls

Institutional control requirements that are necessary for the viability of both the restricted release and alternate criteria provisions of the LTR (i.e., 10 CFR 20.1403 and 1404, respectively) have been difficult for licensees to implement, particularly for those sites contaminated with long-lived radionuclides such as uranium and thorium. Although only a few sites are considering restricted release at this time, resolving this issue, so that the restricted release provision is more viable, may allow decommissioning progress at these few sites. At this time no sites are considering license termination using alternate criteria.

The staff evaluated information and experience from other NRC regulations, EPA, DOE, Agreement States, National Research Council reports, and an American Society for Testing Materials (ASTM) standard, to gain insights about how others are addressing this issue. Key insights from these evaluations include: 1) many organizations recognize the potential for eventual failure of institutional controls, particularly over the long term; 2) appropriately selecting, implementing, monitoring, and enforcing institutional controls will help minimize or mitigate the potential for failure of institutional controls; 3) in some cases, an ongoing Federal role is critical to assure long-term effectiveness of institutional controls; and 4) flexibility is needed to implement institutional controls that address site-specific characteristics.

The staff evaluated several options, including those directed by the Commission, and offer several recommendations. Recommendations are made to clarify the LTR's risk-informed and graded approach for institutional controls and clarify how existing options can be used more effectively over long time periods. In addition, new options are recommended to involve NRC in long-term oversight, either with a monitoring and, if necessary, an enforcing role after license

termination, or with a possession-only specific license for the time period restrictions are needed. However, it should be noted that at the time the LTR was promulgated, license termination was expected to have finality and that absent significant threats to public health and safety, NRC would no longer have an oversight role at a terminated site. The staff believes the recommended options can be implemented by revising the existing guidance and informing licensees and stakeholders with a RIS.

These recommendations should result in the following outcomes: 1) in the near-term, make the restricted release provision more viable and available for licensee use by providing new options and clarifying the risk-informed and flexible graded approach to select options; 2) provide more effective restrictions that protect the public health and safety over the long-term; 3) become more consistent with EPA's approach and recommendations of the National Research Council and the ASTM Standard; 4) should increase public confidence and acceptance of restricted use under the LTR; and 5) allow productive reuse of some sites. All these outcomes will enhance the decommissioning of existing licensed sites. Although they could also pertain to future licensees, the potential for future licensees needing restricted release should be reduced by the recommendations for other LTR issues, including measures to prevent future legacy sites, on-site disposals, and more realistic exposure scenarios.

b. Realistic Exposure Scenarios

Staff 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 land use scenarios for the 1000-year dose assessment time period for both the unrestricted release cases and restricted release (assuming failure of institutional controls) and whether more realistic scenarios can result.

The staff evaluated NRC's existing guidance, licensee and staff experience using this guidance, case studies that have resulted in selecting more realistic scenarios, and approaches used by EPA. Two options were evaluated to achieve more realistic scenarios. One was to improve the implementation of the current approach and guidance by training and sharing with licensees more realistic case studies. The other option was to allow justification of scenarios based on reasonably foreseeable future land use, as opposed to defaulting to very conservative scenarios such as the resident farmer. The staff recommends the option of using reasonable foreseeable land use. This option includes identifying reasonably foreseeable land use scenarios that are likely within the foreseeable future (e.g., the next few decades and to possibly 100 years), considering advice from land use planners and stakeholders. This option would also identify less likely, alternate scenarios to the reasonably foreseeable scenarios, to understand the robustness of the analysis. Compliance would be based on a range of reasonably foreseeable scenarios, but evaluating less likely alternate scenarios would provide information to reach a risk-informed decision. This option is consistent with the LTR critical group concept. Therefore, the staff recommends implementing this option using revised guidance, staff training, sharing the approach with licensees, and a RIS. The outcome of this recommendation would be a clearer approach and guidance to implement dose assessment exposure scenarios that are more realistic and risk-informed. Application of this approach might also result in fewer restricted release sites and less costly cleanup to unrestricted release levels.

c. Financial Assurance Measures to Prevent Future Legacy Sites

A number of sites licensed before the financial assurance regulations were issued in 1988 now find that the full cost of decommissioning exceeds their projections and fund balances. Furthermore, staff experience applying the financial assurance regulations has resulted in many lessons-learned that can be applied to improve the regulations and reduce the risks to decommissioning financial assurance. Based on this experience, the staff focused on specific risks that could cause shortfalls in decommissioning funding including: 1) restricted release assumption causes underestimation of decommissioning costs; 2) operational indicators of increasing costs; 3) unavailability of funds in bankruptcy; 4) inadequate financial disclosure; 5) reaching assets after corporate reorganization; 6) investment losses reducing trust account balances; and 7) increased decommissioning cost due to accidental release.

For each of these funding risks, the staff evaluated options and made recommendations for both existing and future licensees. To resolve the risk of underestimating decommissioning costs, the staff recommends requiring a licensee to obtain NRC approval of the decommissioning funding plan and prepare a cost estimate assuming unrestricted release, unless the licensee can demonstrate its ability to meet the restricted release requirements. The staff also recommends using a risk-informed approach to identify high-risk operational indicators (e.g., spills, groundwater contamination, and facility modification) and requiring updates to decommissioning cost estimates and financial assurance coverage. New requirements are recommended for additional certification of financial statements; holding parent company and subsidiaries liable for decommissioning costs by license conditions and/or agreements; and for licensees to perform periodic evaluations of the impact of investment losses on their trust fund balances and sufficiency of financial assurance coverage. A new rulemaking and implementing new guidance are recommended actions. The outcome of these recommendations should be to effectively reduce funding risks that could cause shortfalls in decommissioning funding, thus minimizing the potential for future legacy sites.

3. Recommended Implementation Actions

The following four actions would implement the recommendations in Attachment 10.

1) Rulemaking: Conduct a new rulemaking to examine adding and revising requirements for: a) financial assurance and b) licensee monitoring, reporting, and remediation to reduce the potential for future legacy sites. This single rulemaking would consider the specific recommendations in both Attachments 7 and 8 if conducting a rulemaking is approved by the Commission.

2) Guidance: Develop new guidance to implement the above rulemaking and revise existing guidance to address options for restricted release, on site disposal, and selecting realistic land use scenarios. Guidance development would include an opportunity for public comment.

3) Inspection and enforcement guidance: Revise the existing inspection and enforcement guidance to enhance monitoring, reporting, and remediation to prevent future legacy sites.

4) RIS: Prepare a RIS to inform a wide range of stakeholders about the LTR analysis of each issue, Commission direction, and planned actions.

4. Overall Outcomes Expected from Recommendations

SECY-02-0177 identified desired outcomes, or objectives, for each LTR issue to help guide the evaluations. As a follow-up, each of NRC's Strategic Plan performance goals was considered in conducting evaluations and making recommendations. Detailed outcomes relative to NRC's four performance goals are given in Attachment 12.

In summary, the outcomes of the staff's recommendations affect both existing decommissioning sites and future decommissioning sites. Existing decommissioning sites can be either licensees currently in decommissioning or formerly terminated NRC licensed sites where more cleanup is needed. Within this group are complex sites, including those with long-lived radionuclides (e.g., uranium and thorium), that have difficulty decommissioning, for a variety of financial, technical, or programmatic reasons. These sites can be thought of as NRC "legacy" sites—those sites where past operating or financial events have created the existing problems that must now be overcome, in some way, to conduct sufficient cleanup and ultimately complete decommissioning and license termination. The staff's recommendations are also prospective and based on lessons learned from the existing licensees. These recommendations will affect both currently operating licensees, who will decommission in the future, and new future licensees.

For existing decommissioning sites, particularly the complex sites with long-lived radionuclides, many recommendations should facilitate decommissioning by addressing key challenges these sites must address. Consistent use of more realistic exposure scenarios could result in more economical decommissioning, while maintaining safety. Furthermore, this recommendation could also result in fewer sites that might need to use the restricted release or alternate criteria. For those few sites, however, that might still need to use the restricted release or alternate criteria provisions of the LTR, viable options for restricting site use are recommended. A clarification also is recommended to improve the understanding of the risk-informed graded approach for selecting institutional controls and the flexibility this approach provides to licensees. This approach clarifies the use of more conventional institutional controls, such as deed restrictions, for lower-risk sites and durable institutional controls to enhance the effectiveness of institutional controls for higher-risk sites.

For future decommissioning sites, specific measures are recommended for financial assurance, licensee operations and reporting, and on-site disposal, that should reduce or mitigate the potential for future "legacy" sites. These measures should also reduce the need for using the restricted release or alternate criteria provisions of the LTR. Together, these outcomes contribute to the Commission's preference for license termination, with unrestricted release, which results in the greatest opportunity to return the site to productive use.

Finally, many of the recommendations simply clarify and address questions about the relationship between the LTR criteria and criteria in other NRC regulations such as the unimportant quantities limit in 10 CFR 40.13(a); onsite disposals in 10 CFR 20.2002; and the current case-by-case limit used for controlling the disposition of solids materials.

5. General Schedule for Recommended Implementing Actions

The general schedule for the recommended actions is given below and is based on the assumption, for planning purposes, that the Commission's decision and direction for LTR follow-up actions will be received by September 30, 2003.

Commission paper on mixing	9/30/03
New rulemaking to prevent future legacy sites	
Rulemaking Plan	9/30/04
Proposed Rule	9/30/06
Final Rule	9/30/07
New guidance (supporting new rule)	
Draft	9/30/06
Final	9/30/07
Revised Guidance	
Draft	9/30/05
Final	9/30/06
Revised inspection/enforcement guidance	9/30/05
RIS	3/30/04

RECOMMENDATIONS:

The staff recommends that the Commission approve the options and issue-specific implementation actions in Attachment 10.

RESOURCES:

The LTR analysis and recommended follow-up actions are currently unbudgeted, but resource estimates for the fiscal years (FY) 2004 to 2006 will be addressed using the Planning, Budgeting, and Performance Management process during the development of the FY 2005 budget.

Total resources estimates are given below in full-time equivalents (FTEs) and thousands of dollars (\$K), and a resource breakdown given in Attachment 13.

FY 03:	1.0 FTE	\$0K
FY 04:	1.0 FTE	\$0K
FY 05:	3.0 FTE	\$150K
FY 06:	2.0 FTE	\$100K
FY 07:	1.0 FTE	\$50K

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections. The staff plans on briefing the Advisory Committee on Nuclear Waste in May 2003.

/RA by Carl J. Paperiello Acting For/

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Attachments:

1. "Results of Evaluations for the Restricted Release and Institutional Control Issue"
2. "Results of Evaluations for the Relationship between LTR Release Limits and the Unimportant Quantities Limit Under 10 CFR 40.13(a)"
3. "Results of Evaluations for Appropriateness of Developing a Separate Unrestricted Release Standard for Uranium and Thorium"
4. "Results of Evaluations for the Relationship between the LTR and On-Site Disposal under 10 CFR 20.2002"
5. "Results of Evaluations of the Relationship between the License Termination Rule and the Current Case-by-Case Approach for Controlling the Disposition of Solid Materials"
6. "Results of Evaluations for Realistic Exposure Scenarios"
7. "Results of Evaluations for Measures to Prevent Future Legacy Sites by Changes in Financial Assurance"
8. "Results of Evaluations for Measures to Prevent Future Legacy Sites by Changes in Licensee Operations"
9. "Planned Evaluations for Appropriateness of Allowing Intentional Mixing of Contaminated Soil under the License Termination Rule"
10. "Combined Set of Recommended Options and Implementation Actions for All Individual License Termination Rule Issues"
11. "Potential Applicability of License Termination Rule Issues to Existing Decommissioning Sites (SDMP, Complex, and Formerly Terminated Licensed Sites) and Future Decommissioning Sites"
12. "Major Outcomes of License Termination Rule Recommendations with Respect to NRC's Four Performance Goals"
13. "Breakdown of Resource Estimates for Recommended License Termination Rule Analysis Implementation Actions"

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Attachments: See Next Page

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