

**POLICY ISSUE
(Information)**

December 23, 2010

SECY-10-0164

FOR: The Commissioners
FROM: R. W. Borchardt
Executive Director for Operations

SUBJECT: ANNUAL REVIEW OF THE NEED FOR RULEMAKING OR
REGULATORY GUIDANCE ON EXTENDED LOW-LEVEL
RADIOACTIVE WASTE STORAGE

PURPOSE:

To provide an annual update regarding the potential need for rulemaking and/or regulatory guidance for long-term storage (or extended storage) of low-level radioactive waste (LLRW), and to inform the Commission about the staff's formation of a working group to assess the adequacy of current guidance on LLRW storage, the status of the working group's deliberations, and its planned work products.

SUMMARY:

As stated in SECY-06-0193, "Annual Review of the Need for Rulemaking and Regulatory Guidance on Low-Level Radioactive Waste Storage," dated September 6, 2006 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML061730187), the staff considers rulemaking to address extended storage of LLRW to be unnecessary. The U.S. Nuclear Regulatory Commission's (NRC's) current regulatory framework provides an adequate basis for storing radioactive material, including extended storage of LLRW. However, as stated in SECY-09-0188, "Annual Review of the Need for Rulemaking and/or Regulatory Guidance on Low-Level Waste Storage," dated December 31, 2009 (ADAMS Accession No. ML093200008), the staff believes it is prudent to review and assess the continued

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adequacy of existing guidance related to extended storage of LLRW. In SECY-09-0188, the NRC staff, for reasons discussed below, committed to compile and, if necessary, develop detailed guidance related to LLRW storage in a NUREG that will apply to all licensees.

To accomplish these tasks, the Office of Federal and State Materials and Environmental Management Programs (FSME) formed a working group of internal and external stakeholders to evaluate the adequacy of the existing LLRW storage guidance for all types of licensees. After meeting for several months, the consensus of the group was that adequate guidance existed for all types of licensees for various extended-storage circumstances. However, relevant guidance for some of these licensees was not readily apparent or available in a single document. The working group proposed a two-step remedy: First, by mid-2011, the staff will prepare and issue a regulatory issue summary (RIS) for all licensees that will provide references to the best available current guidance for extended storage of LLRW for each type of licensee for the entire life cycle of the licensee's facility. Second, pending the availability of necessary staff resources, the staff will prepare a NUREG that consolidates in one document all the guidance related to extended storage of LLRW for all licensees. Development of the NUREG will also involve working group participation, as well as consultation with a larger group of stakeholders, including public interest groups.

BACKGROUND:

In the staff requirements memorandum for SECY-03-0223, "Rulemaking Plan: Assured Isolation Facilities," dated January 29, 2004 (ADAMS Accession No. ML040290568), the Commission directed staff to provide an annual update on the need for regulations or regulatory guidance related to extended storage of LLRW. Since then, the staff has communicated annually with the Commission in the form of Commission papers.

In the 2008 and 2009 updates, the staff reported on recent efforts to revise guidance related to some licensees' need to provide for extended storage of LLRW because of the lack of disposal access, due to the closure of the LLRW disposal facility near Barnwell, South Carolina to "out of compact waste" on July 1, 2008.

In SECY-09-0188, the staff also identified several emerging issues that reinforce the need to reestablish the adequacy of current LLRW extended storage guidance and to compile the guidance in a more concise format. These emerging issues included, but were not limited to, contentions raised by interveners in new reactor licensing proceedings, and concerns related to some materials licensees' continued ability to safely and securely store unwanted radioactive material. To address these issues, the staff committed to continue to dialogue with stakeholders and to continue compiling detailed guidance related to LLRW storage in a NUREG that will apply to all licensees.

DISCUSSION:

On July 1, 2008, the Barnwell, South Carolina, LLRW disposal facility closed to LLRW generators outside of the Atlantic Compact¹. As a result, LLRW generators without access to the Barnwell or Richland, Washington commercial disposal sites have had to use extended storage for Class B and C LLRW.² As the volume of Class B and C LLRW increases in States without a disposal pathway, it is likely that licensees and other stakeholders will become more concerned regarding safe and secure storage of this material.³

Both NRC and Agreement State licensees have continued to safely and securely store waste. However, there have been significant challenges, particularly to medical and academic users of radioactive sealed sources and other radioactive materials. The staff documented many of these challenges in SECY-10-0008, "Status Report Regarding Staff Efforts to Work with Stakeholders to Catalogue Important Research that has been Affected by the Lack of Disposal Options for Radioactive Sources," dated January 22, 2010 (ADAMS Accession No. ML093100241). Some States without disposal access and the National Nuclear Security Administration (NNSA) have been working to address some of these challenges. More than 4,000 small sealed sources have been registered as unwanted or disused sources in the Source Collection and Threat Reduction Program administered by the Conference of Radiation Control Program Directors (CRCPD). These sources are being stored safely and securely by licensees throughout the United States. CRCPD is working with NNSA through its Off-Site Source Recovery Project to find solutions that would remove these sources from storage and relocate them to permanent, safe, and secure environments.

Licensees and regulators have also expressed concerns about the potential effects of future regulatory actions on the number and types of unwanted and disused sources in storage. Some licensees may be unable to meet additional regulatory requirements and will opt to discontinue licensed activities, as these activities will no longer be profitable. With no disposal options, licensees may be required to safely and securely store radioactive sources for longer than they had planned. Higher activity sources, which are a greater threat, may have to be permanently stored on site, which could become a financial burden to licensees and a security threat.

Recognizing that the continued lack of disposal access means that many licensees will be forced to store at least a portion of their LLRW, the NRC staff considered it appropriate to reevaluate the adequacy of existing guidance related to LLRW storage. Further, the reevaluation would benefit from the perspectives of a variety of stakeholders, both internal and external. In the spring of 2010, the staff created a working group comprising representatives of NRC Headquarters offices: FSME, both the Division of Materials Safety and State Agreements (MSSA) and the Division of Waste Management and Environmental Protection (DWMEP); the

¹ Comprised of South Carolina, Connecticut, and New Jersey.

² Most generators in the 36 States and territories that do not have access to these 2 compact facilities can still dispose of most Class A LLRW (with the exception of radioactive sealed sources) at a commercial LLRW disposal facility near Clive, UT.

³ The State of Texas recently issued a LLRW disposal facility license to Waste Control Specialists to construct and operate a facility near Andrews, TX. The Texas Compact Commission is considering rules that may allow the disposal of some out-of-compact waste at the Andrews facility. This process is in its very early stages and it would be premature to infer a result. The staff will continue to monitor this situation and will provide updates to the Commission as warranted.

Office of Nuclear Material Safety and Safeguards (NMSS); the Office of Nuclear Reactor Regulation (NRR); the Office of New Reactors (NRO); and the Office of Nuclear Security and Incident Response (NSIR); and all four regional offices. FSME representatives convene the meetings and coordinate working group activities. External stakeholders include representatives of the Organization of Agreement States, CRCPD, the Nuclear Energy Institute, the Electric Power Research Institute, and American Nuclear Insurers (in a limited capacity). The working group also includes subject-matter experts representing radioactive materials and sealed source manufacturers and users. The staff anticipates broadening the membership of the working group during the creation of the work products discussed in this report: public interest groups and other subject-matter experts will be invited to participate. The staff is also considering the application of the Federal Advisory Committee Act to this working group.

The working group began deliberations in April 2010 and holds monthly teleconference meetings. After two meetings, the working group agreed that it would be appropriate to divide into two subgroups. One subgroup focuses on storage issues germane to nuclear power plants. The other focuses on issues related to other types of licensees, including materials licensees, fuel cycle facilities, and research and test reactors (including medical isotope production facilities). The division was appropriate because the circumstances, resources, and infrastructure and regulatory bases differ for power reactors and other types of licenses. The division into subgroups facilitates discussion of topics related to that group, but there appears to be enough commonality among the issues discussed by the subgroups that resultant work products can be combined.

The working group and subgroups identified and evaluated the existing LLRW storage guidance applicable to all licensees, including NRC guidance in NUREGs, Commission papers, generic communications, position papers, and inspection procedures. The working group and staff initially identified both general and detailed LLRW storage guidance that is currently applicable to various types of licensees, power reactors, research and test reactors, fuel enrichment facilities, other fuel cycle facilities, radioactive materials users (including sealed sources), and decommissioning facilities. The working group agreed on several common elements (see [Enclosure 1](#)) that contribute to the goals of worker protection, protection of the general public, protection of the environment, security, and material control. The group agreed that the criteria for determining the adequacy of guidance would be based on the availability of guidance that addresses each of these elements at some level.

After reviewing the available guidance, the subgroups agreed that adequate guidance was available for all types of licensing circumstances but noted that not all guidance is readily accessible, or its relevance may not be readily apparent. Because the existing guidance is contained in multiple documents, it is difficult to navigate and integrate (i.e., guidance is contained in NUREGs, generic communications, and Commission papers directly related to extended LLRW interim storage). Guidance is also contained in other NRC communications that are indirectly related to extended storage (e.g., NUREG-1556 series, "Consolidated Guidance About Materials Licenses"). Further, relevant guidance is also contained in the publicly available documents of other Federal Government agencies, States, and industry. [Enclosure 2](#) provides examples of existing guidance.

For this reason, the subgroups decided to use a two-phase approach to update and consolidate guidance related to extended storage of LLRW. In the near term, NRC staff, with the assistance of the working group and input from other stakeholders, will develop and issue a RIS that will identify current NRC guidance, guidelines, position statements, and other related documents that are relevant to various types of licensees and licensing circumstances. The RIS will also identify relevant material developed by other entities (e.g., U.S. Department of Energy [DOE] orders related to storage of depleted uranium, U.S. Environmental Protection Agency regulations related to mixed hazardous and LLRW, and State regulations related to consolidated storage). Because the development of an RIS is a relatively simple process, the staff and working group believe that this product can be available by mid-2011.

The second phase of the staff's proposal is the development of a NUREG containing consolidated guidance for all licensees who store LLRW. The scope of the NUREG would include both routine LLRW storage, as well as extended storage options for unwanted radioactive material that would otherwise be destined for an LLRW disposal facility licensed in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," or an Agreement State equivalent. (The NRC and Agreement States believe that disposal is preferable to extended storage but cannot compel it, even if disposal access is available, as long as licensees comply with possession limits and other license restrictions.) The NUREG would not address sequestered material that may be disposed of as other than LLRW, uranium mill tailings, short half-life unwanted material that can decay in storage, or other unwanted material for which interim storage for a finite time period is part of a well-defined and implemented disposition pathway.

The working group believes that it may not be necessary to propose new guidance in the NUREG; rather, the NRC can consolidate guidance that is currently available from a variety of other sources, as noted above. However, if a need for new guidance is subsequently identified, the staff could develop new guidance or clarify existing guidance through the NUREG development process.

The guidance in the NUREG would be tiered. The first tier would be guidance that is relevant to all licensees and provides a general discussion of common elements of LLRW storage. Examples include the need to ensure continued container integrity, the need for secondary containment of stored liquids, the need for accurate inventories and recordkeeping, and similar suggestions applicable in all circumstances. The second tier would be guidance that is relevant to specific licensing circumstances. Examples include guidance related to the need, or lack thereof, of a separate review under 10 CFR 50.59, "Changes, Tests and Experiments," for extended storage of LLRW at nuclear power plants, and DOE orders related to storage of large quantities of uranium hexafluoride at uranium enrichment facilities. The third tier would be annotated references to documents that address one or more of the common elements related to LLRW that are not adequately addressed in tier 1 and 2 guidance. An example is Volume 15, "Guidance About Changes of Control and About Bankruptcy Involving Byproduct, Source, or Special Nuclear Materials Licenses," of NUREG-1556, which addresses bankruptcy. The NUREG would not replace or eliminate inspection procedures related to LLRW storage; rather, the staff would ensure that the NUREG remains consistent with the inspection procedures.

The NUREG would also contain a brief history of the evolution of NRC guidance related to extended storage of LLRW, including a discussion of how certain guidance has been superseded with time.

The staff believes that the creation and approval of a NUREG would probably take a year or more, depending on the availability of resources. The process would include solicitation of a broad range of perspectives through expansion of working group membership and several public meetings. The staff would make the draft NUREG available for public review and comment in a *Federal Register* notice.

During their deliberations, the subgroups and staff identified several evolving issues that may affect extended LLRW storage for which guidance may not be readily apparent, or for which some clarifying language may be needed. For power reactors, these circumstances include the need to anticipate life-of-plant (LOP) management of LLRW (not necessarily LOP storage) and liability and financial assurance associated with LLRW from multiple nuclear power plants co-located at one location, and the possible impacts of the proposed 10 CFR Part 37, "Physical Protection of Byproduct Material."

For radioactive materials licensees, these circumstances include the possible deterioration of a licensee's ability to maintain control of radioactive material because of deteriorating financial circumstances, new waste streams requiring storage (e.g., cobalt-60 associated with radiochemical production), waste associated with medical isotope production, waste associated with spent nuclear fuel reprocessing, and mechanisms for relief from increased control orders for licensees who can demonstrate disaggregation of radioactive materials in quantities of concern. The staff believes that existing guidance adequately informs these topics, the proposed NUREG would then consolidate this guidance in a single document.

There are other regulatory issues tangential to the extended storage of LLRW that may be more appropriately addressed in other regulatory communications. For example, a related issue identified by the working group was the need to examine current license conditions and enforcement guidance related to the extended storage of LLRW as a precursor to disposal as non-radioactive waste. Materials licensees are regulated by license condition to allow for the disposal, as non-radioactive waste, of only those radioactive materials with a half-life less than 120 days. Due to limited disposal options for radioactive material with half-lives greater than 120 days, many licensees have requested relief from this license condition. NRC licensing practice has been to issue an amendment to these licenses authorizing these materials for "possession only, incident to disposal." However, current inspection and enforcement procedures do not provide relief in cases where LLRW with half-lives greater than 120 days is being stored by licensees who have no disposal options available.

There may also be long-term emerging LLRW storage issues related to new waste streams that are beyond the scope of the work products described in this report. These issues may be more appropriately addressed in future regulatory actions, including possible rulemaking initiatives or development of additional guidance documents.

CONCLUSION:

The NRC staff, assisted by a working group, reaffirmed its previous position that rulemaking related to extended storage of LLRW is unnecessary. The staff is, however, conducting a two-phase approach to update guidance related to the extended storage of LLRW. Although the working group and the staff determined that adequate guidance from NRC sources and elsewhere already exists, the guidance is located in various sources, and therefore, not always readily available.

The first phase to address this issue will be the preparation of a RIS that will provide references to all the best available current guidance for extended storage of LLRW for each type of licensee. Because an RIS is a reasonably simple and straightforward communication tool, the staff and working group anticipate its completion by mid - 2011.

The second phase, pending resource availability, will be the preparation of a NUREG containing consolidated guidance for extended storage of LLRW by all licensees. The working group does not anticipate the need for new guidance; rather, the NUREG would be a restatement and consolidation of information already provided in various existing guidance documents. Because of the scope of this process, the staff and working group anticipate that the draft NUREG may be available by late 2012.

Staff believes that these work products will contribute to a common understanding and awareness of the availability and applicability of guidance related to extended storage of LLRW. The documents may also be resources for State officials and other stakeholders. Finally, the staff believes that the documents will support the agency's knowledge management goals related to LLRW knowledge management as articulated in SECY-07-0180, "Strategic Assessment of Low-Level Radioactive Waste Regulatory Program," Appendix E, dated October 17, 2007. (ADAMS Accession Nos. ML071350291 and ML071350461).

COMMITMENTS:

The staff has committed to the following actions in this paper:

- (1) Per its commitment in SECY-09-0188, the staff will continue stakeholder interaction regarding any emerging issues that may result from the need for extended interim storage of LLRW as a result of the limited access to the Barnwell, South Carolina, LLRW disposal facility, as well as other LLRW access limitations.
- (2) With the assistance of the working group, the staff will prepare and issue a RIS that contains references to currently applicable guidance for all licensees about providing for extended storage of LLRW. The staff anticipates completion of the RIS by mid - 2011.
- (3) With the assistance of the working group, and pending the availability of resources, the staff will prepare for review and public comment, a draft NUREG that will contain consolidated guidance for all licensees related to the extended storage of LLRW. The staff anticipates completion of the draft NUREG by late 2012. Completion of the NUREG will depend on the availability of resources.

- (4) In its next annual report to the Commission on extended storage of LLRW, staff expects to report on the completion of the RIS discussed herein. Staff will also report on progress in developing the NUREG, as well as a final completion date. The staff will also provide additional recommendations to the Commission regarding the need for continued reporting on the topic on an annual basis.

RESOURCES:

The staff commitment to implement the actions summarized in this report is consistent with SECY-07-0180, "Strategic Assessment of Low-Level Radioactive Waste Regulatory Program," dated October 17, 2007. The staff estimates that approximately 1.4 - 1.5 full-time equivalent (FTE) will be required through mid-FY 2012 (which are included in the FY 2012 Budget to the Office of Management and Budget) are distributed as follows: FSME/DWMEP — 0.5 FTE; FSME/MSSA — 0.2 FTE; NRR — 0.2 FTE; NRO — 0.1 FTE; NMSS — 0.1 FTE; NSIR — <0.1 FTE; Regions — 0.2 FTE cumulative; other offices — 0.1 FTE cumulative.

COORDINATION:

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

/RA by Michael F. Weber for/
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Enclosures:

1. [Common Goals and Elements for All Licensees for Extended Low-Level Radioactive Waste Storage](#)
2. [Examples of Existing Guidance Relevant to Extended Storage of Low-Level Radioactive Waste](#)

Common Goals and Elements for All Licensees for Extended Low-Level Radioactive Waste Storage

The following is intended to represent the goals and elements that are common to extended storage of low-level radioactive waste (LLRW) by all types of licenses and all types of storage circumstances. The rigor needed for implementation of these elements for different types of licensees varies significantly.

Goals:

Worker Protection - protection of workers directly or indirectly impacted by storage from radiological and other hazards.

Protection of the general population - protection of general population from direct radiation, potential radioactive effluents, and the possibility of inadvertent intrusion.

Protection of the environment - protection of the natural environment from radioactive effluents.

Security - verification that storage security is consistent with characteristics and attractiveness of stored waste.

Material Control - continued assurance that radioactive material remains under the unambiguous control of the licensee and that the licensee has the capability, financial and otherwise, to maintain control.

Communications - clear and transparent interactions with the public and other stakeholders to provide objective information, understand the need for radioactive materials that generate LLRW and address public perceptions.

Elements:

Design basis - minimum performance requirements for storage system whether stand alone dedicated storage facility or an ad hoc shared facility.

Construction verification - verification that storage system has been built, fabricated, or established in a manner that ensures compliance with the design basis.

Inspection frequency, content, and basis - how often to inspect a storage facility, what to inspect, and why.

Recordkeeping and reporting - content of records associated with extended storage, reporting requirements and frequency.

Waste package integrity - assurance that waste package remains capable of safely containing its waste contents.

Waste form- assurance that waste form is, or can be rendered consistent with, extended storage, transportation for processing or disposition, and disposition or disposal.

Storage environment - verification of the compatibility of the storage area with an adjacent facility or land use.

Worker training and competency - verification that waste storage radiation workers and rad techs have training and/or competency necessary for waste storage management activities.

Worker availability - verification that the work force is sufficient and available to perform waste storage activities.

Performance verification - verification that the storage facility, area, and stored waste is continually performing according to design basis and operational objectives.

Environmental monitoring - effluent and/or direct radiation monitoring, if necessary, to verify protection of the general public and the environment.

Financial assurance - adequacy and permanency of the financial resources necessary to affect all aspects of end-of-life management of LLRW; guidance on acceptable methods for determining storage; and ultimate disposal costs.

Liability transparency - unambiguous lines of responsibility for management and disposition of LLW, including responsibility for any accidents, incidents or releases attendant with the LLW.

Emergency contingency planning - clear and comprehensive plans and implementation strategy associated with various unlikely but possible adverse circumstance.

Waste avoidance - minimization of LLRW produced.

Waste storage avoidance - alternative processing and disposal. Use of alternative technologies.

Emergency provisions for management and disposal of waste - take title, qualification of federal waste disposal sites.

Examples of Existing Guidance Relevant to Extended Storage of Low-Level Radioactive Waste

Please note that the following does not represent a complete list of all of the reference material that contains extended storage guidance for low level radioactive waste. Rather, the list responds to the statement made in the body of the SECY paper, page 4.

1. RIS-08-012 - Consideration for Extended Interim Storage of Low-Level Radioactive Waste by Fuel Cycle and Materials Licensees, May 9, 2008. (ADAMS Accession No. ML073330725)
2. RIS-08-032 - Interim Low-Level Radioactive Waste Storage at Reactor Sites, December 30, 2008. (ADAMS Accession No. ML082190768)
3. SECY-94-198 - Review of Existing Guidance Concerning Extended Storage of Low-Level Radioactive Waste, August 1, 1994. (ADAMS Accession No. ML0716404623)
4. EPRI - Guidelines for Operating an Interim On-Site Low-Level Radioactive Waste Storage Facility, April 2008. (ADAMS Accession No. ML0815802703)
5. NUREG 1537 - Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, February 1996. (ADAMS Accession No. ML042430055, ML042430048)
6. NUREG 1757 - Consolidated Decommissioning Guidance. (ADAMS Accession No. ML020380319)
7. LLRW Tool Box <http://nrc-stp.ornl.gov/llrw.html>.