UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF FEDERAL AND STATE MATERIALS
AND ENVIRONMENTAL MANAGEMENT PROGRAMS
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, DC 20555

May 9, 2008

NRC REGULATORY ISSUE SUMMARY 2008-12 CONSIDERATIONS FOR EXTENDED INTERIM STORAGE OF LOW-LEVEL RADIOACTIVE WASTE BY FUEL CYCLE AND MATERIALS LICENSEES

ADDRESSEES

All holders of U.S. Nuclear Regulatory Commission (NRC) fuel cycle and materials licenses. All Radiation Control Program Directors and State Liaison Officers.

INTENT

The NRC is issuing this regulatory issue summary (RIS) to inform addressees of considerations related to extended interim storage of low-level radioactive waste by fuel cycle and materials licensees that may be necessary as a result of loss of permanent disposal capacity for some classes of LLRW. Not all of these licensees will need to store LLRW for an extended period. No specific action or written response is required. NRC is providing this RIS to Agreement States for their information and distribution to their licensees as they consider appropriate.

BACKGROUND

This RIS presents considerations related to the extended interim storage of low-level radioactive waste (LLRW). It updates information provided in Information Notice (IN) 90-09 "Extended Interim Storage of Low-Level Radioactive Waste by Fuel Cycle and Materials Licensees," dated February 5, 1990. (Similar information for power reactor licensees is given in Generic Letter 81-38, "Storage of Low-Level Radioactive Wastes at Power Reactor Sites," dated November 10, 1981)

The Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA) established a series of milestones, penalties, and incentives to ensure that States or regional compacts make adequate progress towards being able to manage their LLRW. Throughout the 1980s and 1990s, the States and compacts worked to implement the requirements of the LLRWPAA with limited success. After June 30, 2008, it is likely those LLRW generators and licensees in 36

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States, the District of Columbia, the Commonwealth of Puerto Rico, and the U.S. Territories will lose access to the full-service LLRW (Classes A, B, and C LLRW as defined in section 61.55 of 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste") disposal facility in Barnwell, South Carolina. Consequently, many LLRW generators will likely need to store a portion of their LLRW for an indefinite period. This will include Class B and C waste as well as certain Class A waste streams that do not meet the waste acceptance criteria of the LLRW disposal facility in Clive, Utah. [1]

Additionally, the events of September 11, 2001, have changed the Nation's safety and security paradigm for the possession and storage of byproduct, source, and special nuclear materials. Guidance for extended LLRW storage needs to be considered in the context of changing regulatory requirements. For instance, additional requirements have been imposed on radioactive materials licensees who are authorized to possess radionuclides of concern in quantities exceeding certain threshold limits (see, e.g., 70 Federal Register 72128 (December 1, 2005) (Order Imposing Increased Controls); 72 Federal Register 70901 (December 13, 2007) (Order imposing Fingerprinting, and Criminal History Record Checks Requirements for Unescorted Access to Certain Radioactive Materials)). Changes in license possession limits necessitated by interim storage of LLRW may result in possession of radionuclides of concern in quantities exceeding these threshold limits. In such cases, additional requirements – like those cited above – may be imposed on licensees.

The staff also prepared recommendations related to storage of all LLRW in SECY-94-198, "Review of Existing Guidance Concerning Extended Storage of Low-Level Radioactive Waste," dated August 1, 1994. To the extent that the recommendations relate to storage of LLRW by materials and fuel cycle licensees, they are reemphasized here.

SUMMARY OF ISSUE

Some licensees may need a license amendment to allow on-site storage of some LLRW for which disposal capacity is not available. Before considering extended storage, licenses are encouraged to implement measures to minimize production of LLRW for which there is no disposal option. If the possession limits specified in a license need to be increased to allow for extended interim storage, or if the terms and conditions of a license otherwise need to be modified, a license amendment or equivalent compliance mechanism will be required. Enclosure 1 to this RIS identifies information that NRC is likely to require in support of such amendment requests. This information may also be useful to other licensees as they assess the adequacy of their storage methods and to potential applicants for a license to construct and/or operate a centralized storage facility.

The following considerations are central to extended storage and are the basis of the information included in Enclosure 1:

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[1] Certain other Class A Waste does not include discrete sources of Radium – 226 and other naturally occurring and accelerator produced radioactive material (NARM) which may create the potential for new LLRW streams that would require storage. The EPAct 2005 specifically preserves pre-existing disposal options for this material.

- Storage is not a substitute for disposal. Other than storage for radioactive decay or other short-term operational considerations, LLRW should be stored only when disposal capacity is unavailable and for no longer than necessary. When feasible, licensees may wish to specify a date by which storage of specific waste streams will end and disposal or alternative disposition (such as processing for radioactive waste volume reduction, or, in the case of sealed sources, return to manufacturer) of the LLRW will take place. As part of their planning efforts, licensees may wish to also identify any stored waste streams (e.g., Class B, C, greater than Class C, unprocessed biological waste) for which no disposition pathway is reasonably foreseen, and be prepared to identify such waste streams to NRC officials upon request.

- Waste should be stored in a form suitable for disposal if there is sufficient assurance that the waste form is ultimately acceptable for disposal and will not require significant reprocessing. Licensees may wish to process and/or package the waste to be stored in a manner consistent with physical stability and radiation protection goals including the consideration to keep exposure as low as reasonably achievable (ALARA). Processing and/or packaging should not preclude or diminish the likelihood of future transportation or alternative disposition pathways for any waste stream in accordance with 10 CFR Part 20, "Standards for Protection Against Radiation," Subpart K, "Waste Disposal." Individual circumstances will determine whether labeling containers of stored LLRW is required in accordance with 10 CFR 20.1904, "Labeling Containers," or exempt in accordance with 10 CFR 20.1905, "Exemptions to Labeling Requirements."

- To ensure the integrity of packaging and maintenance of waste form, stored waste packages should be protected from the elements (e.g., wind and precipitation) and from extremes of temperature and humidity. To the extent that circumstances make it impractical to provide such protection from climate, the licensee may wish to determine how it will maintain package integrity and prevent the release of stored LLRW despite the exposure of stored waste packages to the elements. For example, maintaining a brief assessment of time-dependent deterioration that considers the specific packaging and form of the stored waste and a contingency plan for mitigation of such package deterioration to prevent radioactive release or contamination could constitute sufficient action to maintain package integrity.

- Waste should be stored in an area that permits ready visual (direct or remote) inspection on a routine basis. Licensees may wish to conduct and document such inspections on a quarterly basis (or on an alternative schedule as justifiable by an overall assessment of the inherent safety, stability, and security of the LLRW storage system).

- In addition to existing measures to locate waste during an emergency, the licensee may wish to consider a real-time waste tracking system that allows the location of specific packages or accumulations of packages during emergencies.

- Licensees should evaluate the potential for deterioration of waste packages and determine whether procedures and equipment may be needed to repackage waste. If so, licensees may wish to have them available.

- Decomposition and chemical reaction of incompatible waste materials over time can result in gas generation or other reaction products. Licensees may wish to evaluate

radioactive waste that they are planning to store and take measures to prevent or mitigate the adverse consequences of these reactions. Furthermore, licensees may wish to determine if the need exists for additional ventilation, air filtration, or fire detection/alarm/protection /suppression systems.

In view of the increased quantities and potential changes in chemical compositions of radioactive waste that may now be stored for longer periods of time, licensees are reminded to assess whether new or revised provisions are necessary for their waste facility environmental release and contamination monitoring programs in order to continue to assure, and in some cases demonstrate, compliance.

- Most waste forms and packaging used for extended interim LLRW storage are not likely to represent a significant increment of direct radiation exposure potential to workers. However, licensees may wish to consider their specific waste and storage plans and determine if additional radiation shielding or other actions are warranted to keep radiation exposures ALARA.

- Waste should be stored in a manner that minimizes potential exposure to workers who are required to access it periodically. Licensees may wish to consider possible alternative disposition pathways and times for different waste streams. In some cases, tradeoffs may be justified between package dose rate and ease of accessibility. In such cases, the NRC recommends that licensees prepare an ALARA analysis to justify the tradeoff. Security considerations may also be factors in the analysis.

- Stored waste should be located in a restricted area or managed in accordance with Commission regulations in 10 CFR 20.1801, “Security of Stored Material.” This regulation requires licensees to secure, from unauthorized removal or access, licensed materials that are stored in controlled or unrestricted areas. When waste storage areas are unoccupied by authorized personnel, stored waste should be locked inside a facility (the storage area itself, an immobile safe, or a similar secure device with access limited to authorized personnel) as part of a key control system or equivalent system.

- Licensees who received or will receive increased control and related orders addressing fingerprinting and criminal history should follow the requirements of those orders, including specific security, access, and detection requirements. Similarly, licensee programs already established to implement those orders should be reviewed to determine necessary revision/expansions of the program to assure that continued compliance with those orders is carried over to the areas where waste containing radioactive material in quantities of concern will be stored and handled/processed.

- Given the uncertainties regarding disposition alternatives for some LLRW, it may not be practical to establish a specific time limit for retention of LLRW in extended interim storage. However, the NRC recognizes that it is prudent practice to move LLRW from storage to permanent disposal/disposition as quickly as is practicable. Licensees storing LLRW are encouraged to develop and maintain a strategy and timeline for disposition and/or disposal of LLRW in their possession. Different strategies and timelines may be appropriate for waste streams having or requiring different disposition pathways. Waste streams for which the licensee can identify no foreseeable disposition pathway should be specifically acknowledged.

Notwithstanding the absence of a specific time limit for storage, NRC staff will undertake a licensing review of LLRW storage circumstances at the end of each license renewal period for NRC licensees. To facilitate such review, the NRC encourages licensees to periodically reassess the circumstances dictating indefinite interim storage of LLRW, impacts on licensed activities other than LLRW storage, and impacts on nearby unlicensed activities including activities not under licensee control. The assessment should also include a reevaluation of storage technique, technique for opening/inspecting/replacing package, and recalculation of activity of LLRW in extended interim storage.

Licensees are also encouraged to maintain communication with regional compact and/or unaffiliated State and territorial officials (see Enclosure 2) regarding LLRW disposal options and change in disposal availability circumstances.

- To the extent possible, licensees may wish to estimate the total life-cycle financial burden of extended interim LLRW storage (including but not limited to operations and maintenance, inspection and monitoring, and eventual disposition) and provide this estimate to organization decision makers for overall budget consideration.

- Storage of hazardous waste, as specified under the Resource Conservation and Recovery Act, is beyond the scope of this document. Some licensees will need to store LLRW that also contains hazardous wastes. Either the NRC (or Agreement State) and the U.S. Environmental Protection Agency (or Authorized State) regulate these mixed wastes. The considerations for handling waste provided in this RIS apply only to materials (LLRW) being stored in accordance with NRC regulations. It may be prudent or necessary for the licensee to supplement information contained in this RIS with guidance (or requirements) provided by authorities with jurisdiction over the hazardous component of stored waste.

BACKFIT DISCUSSION

This RIS requires no action or written response and the backfit rule (10 CFR 50.109,70.76, 72.62 and 76.76) does not apply. Consequently, the NRC staff did not prepare a backfit analysis.

FEDERAL REGISTER NOTIFICATION

A notice of opportunity for public comment on this RIS was not published in the *Federal Register* because the RIS is informational and does not represent a departure from current regulatory requirements.

CONGRESSIONAL REVIEW ACT

The RIS is not a rule as designed by the Congressional Review Act (5 U.S.C. §§ 801-808) and, therefore, is not subject to the Act.

PAPERWORK REDUCTION ACT STATEMENT

This RIS does not contain information collections and, therefore, is not subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, et seq.).

CONTACT

This RIS requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate regional office.

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Enclosures:
1. Information that NRC Staff May Require to Authorize Extended Interim Storage of Low-Level Radioactive Waste
2. Regional Compacts, Unaffiliated States and Territories
3. Bibliography
4. List of Recently Issued FSME Generic Communications

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Package No.: ML073330609

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