RADIOACTIVE WASTE MANAGEMENT

PROGRAM APPLICABILITY: 2600

88035-01 INSPECTION OBJECTIVE

The objectives of this procedure are to determine whether:

01.01 The regulatee has established and is maintaining adequate and controlled procedures and quality assurance (QA) programs to ensure compliance with the requirements of 10 CFR Part 20 and 10 CFR Part 61 applicable to low-level radioactive waste form, classification, stabilization, and shipment manifests/tracking.

01.02 The regulatee stores and/or disposes of low-level radioactive waste (LLRW) safely and in accordance with license/certificate[1] conditions. This procedure is applies to any regulatee who stores LLRW, regardless of when the storage facility was established.

88035-02 INSPECTION REQUIREMENTS

WASTE CLASSIFICATION, SHIPPING AND BURIAL:

02.01 Management Controls for Waste Classification, Shipping and Burial. Review the regulatee's written procedures for radioactive waste processing. Determine whether the following aspects are adequately addressed:

a. The organization and individual(s) assigned the responsibility for radioactive waste processing for low-level land burial have been clearly designated in writing;

b. There has been a clear delineation of the authorities and responsibilities of those individuals and organizational entities;

c. Written management-approved instructions have been established to carry out the various radioactive waste processing and packaging activities, including authorized changes thereto, and the promulgation/distribution of such instructions to the appropriate line/staff organization.

02.02 Quality Assurance. Determine whether the regulatee has established and maintains an adequate QA program to determine compliance with the waste classification and characterization requirements of 10 CFR 61.55 and 61.56. Determine whether the QA program includes the required audits and management evaluation of such audits. Review the results of the most recent audit and corrective actions [Subsection III.A.3 of Appendix G to 10 CFR Part 20].

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[1] When license is mentioned, it refers to license or certificate.
QA activities related to implementation of 10 CFR Part 61, 10 CFR 20.2006, and Appendix G to 10 CFR Part 20 are not required to be included under the regulatee's corporate level QA program for "Nuclear Safety Related" items.

02.03 Waste Classification. Review the regulatee's documentation and records of activities that have been established and are being maintained, to determine whether all low-level radioactive wastes are properly classified according to 10 CFR 61.55. Determine whether such efforts reasonably determine whether a realistic representation has been accomplished [Subsection III.A.1 of Appendix G to 10 CFR Part 20].

Review the license requirements for authorized releases of radioactive nuclides in liquid and solid products transferred to non-licensed entities to assure they meet the license requirements.

02.04 Waste Form and Characterization. Review the regulatee's documentation and records of activities, which have been established and are being maintained, to determine whether all low-level radioactive waste meets the waste characteristics of 10 CFR 61.56. Determine whether the methods and determinations of the regulatee provide reasonable assurance that the waste form requirements are met [Subsection III.A.1 of Appendix G to 10 CFR Part 20].

02.05 Waste Shipment Labeling. Review the regulatee's procedures and records to deter mine whether each package of radioactive waste intended for shipment to a licensed land disposal facility is labeled, as appropriate, to identify it as Class A, B, or C waste in accordance with the classification criteria of 10 CFR 61.55 [10 CFR 61.57 and Subsection III.A.2 of Appendix G to 10 CFR Part 20].

02.06 Tracking of Waste Shipments. Review the regulatee's procedures and records to determine whether a system has been established to forward to recipients or deliver to waste collectors, at the time of shipment, a copy of the waste manifest. Determine whether acknowledgment of receipt of the manifest is obtained. Determine whether the regulatee has a procedure in place to initiate an investigation in any instances wherein acknowledgment of receipt of shipment has not been received within the specified period. Determine whether procedures are in place to report such investigations to the appropriate NRC Regional Office and file the required written report. [Subsection III of Appendix G to 10 CFR Part 20].

02.07 Disposal Site License Conditions. Review the regulatee's procedures and records to determine whether the applicable disposal site license conditions are being met. Determine whether that the regulatee has on file a current version of the disposal site license.

SOLID WASTE STORAGE:

02.08 Management Controls and Surveys for Solid Waste Storage. Review the license file and identify any special authorizations and requirements for LLRW storage. Determine where LLRW is being stored. Review how long the LLRW has been stored and examine the regulatee's accountability and security procedures for the waste. Determine whether the regulatee is within the authorized possession limits. Review the regulatee's procedures for safe placement, inspection and repackaging of LLRW in storage. Determine whether or not the regulatee has conducted and properly documented: (1) inspections of LLRW packages to assure they maintain integrity; (2) radiation surveys of individual packages and the storage area, in general; and (3) any required effluent sampling. Review the regulatee's records for waste placed in storage, and determine whether they are adequate to account for the LLRW stored.

02.09 Radioactive solid waste. Determine compliance with the following listed regulations and/or license requirements applicable to the facility.

a. 10 CFR 20.1901, .1902, .1903, .1904, and .1905 [caution signs, labels]

b. 10 CFR 20.2001 [general requirements for disposal]

c. 10 CFR 20.2101, .2102, .2103, .2108, and .2110 [records of ... disposal]

d. 10 CFR 20.2004(a)(2) and (3) [incineration]

e. License requirements for:

1. use of specified containers and packages,

2. identification of the quantity and radionuclide composition of waste in containers and packages,

3. records of waste shipments and waste in storage, and

4. reports of solid waste shipment and waste in storage.

f. Examine several waste packages to determine whether the packages are adequate for the expected term of storage. Determine whether the type of packaging maintains the package integrity.

02.10 Waste burial. Determine compliance with the following license/certificate and regulatory requirements applicable to the facility:

a. use of specified containers and packages,

b. quantity and radionuclide composition of waste in containers and packages,

c. identification of containers and packages,

d. restoration of excavated areas, trenches, etc.,

e. markers for burial sites, e.g., trenches, holes, cairns, vaults, and

f. records (of container contents, burial location, etc.)

g. 10 CFR 20.2002, *Method for obtaining approval of proposed disposal procedures,* and 10 CFR 20.2108, *Records of waste disposal*.

02.11 Adequacy of Storage Area. Inspect the storage area(s) to determine the adequacy of:

a. Access control and security.

b. Access to, and housekeeping around waste packages. Adequate lighting should be provided to permit identification of unsafe radiological and non-radiological conditions.

c. Stable placement of waste or waste packages.

d. Protection from environmental elements, fire and flooding, avoidance of temperature/humidity extremes, and ventilation considerations.

e. Posting and labeling.

f. Segregation from hazardous materials

g. Waste minimization techniques

02.12 Earthen (surface) waste retention systems. If there is a license/certificate requirement for earthen waste retention systems, determine compliance with the license/certificate requirements.

Note: Guidance offered below is specific to Inspection Requirements in Section 02 above: Section 03.01 to 02.01, etc.

General Guidance

As noted in Information Notice 90-09, LLRW storage areas or facilities are being added by regulatees as interim measures until their States or Regional Compacts construct LLRW disposal facilities. Some regulatees already have LLRW storage facilities. Depending on the specific situation of a State or Compact, LLRW may be in storage for anywhere from several months to several years. In general, because the safety hazard of LLRW storage facilities--especially for dry LLRW storage--is low, extensive inspection efforts are not warranted. The inspection effort, therefore, should be geared toward assuring that regulatees who are storing LLRW for such periods are in compliance with possession limits and license/certificate conditions, and do not develop an "out-of-sight, out-of-mind" attitude. This will best be done by examining the regulatee's records to determine whether the required surveys, inspections and accountability checks are being done and then following up with a physical examination of the storage area and waste containers/ packages.

Guidance for inspectors as well as regulatees has been provided by Low Level Waste Management Branch (NMSS) in the form of branch technical positions (BTPs) on "Waste Classification," dated May 1983 (see Federal Register, Vol. 48, No. 110, June 7, 1983), and "Waste Form," dated January 1991 (see Federal Register, Vol. 56, No. 18, January 28, 1991). In addition to the BTPs, NMSS has stated publicly (48 FR 40512, Vol. 48, No. 175, Sept. 8, 1983) that "topical reports" of regulatees that have been reviewed by NMSS may be useful in demonstrating compliance with the requirements. Inspectors should be aware of and be prepared to accept results referenced in such topical reports as demonstration of compliance in specific inspection cases.

WASTE CLASSIFICATION, SHIPPING AND BURIAL:

03.01 Management Controls for Waste Classification, Shipping and Burial. Inspection effort should be directed at determining whether written procedures have been established in a manner approved by management and a discussion and field observation of the program implementation with the regulatee. The procedures should be readily available to any persons having responsibility for low-level waste classification and preparation for transfer of such wastes to land disposal facilities. The inspector should confirm that the written procedures include provisions for all of the applicable activities pertaining to Section 88035-02 Inspection Requirements. The inspector should observe (to the maximum extent possible) workers performing specific tasks and discuss the program with regulatee personnel to determine that waste operations are being conducted safely and in accordance with any applicable approved written procedures.

03.02 Quality Assurance . The written operating procedures and QA procedures of the regulatee collectively are intended to accomplish compliance with the 10 CFR Part 20 and 10 CFR Part 61 regulatory requirements. The nature and scope of the regulatee's QA program will vary depending on the nature and complexity of the specific waste stream. Inspectors should observe whether the program and procedures are effective in causing the regulatee to perform the required waste form classification and characterizations when changes to the waste stream occur.

03.03 Waste Classification. The inspector should review whether the method used by the regulatee is adequate to determine radionuclide concentrations, in order to classify his waste. The NMSS BTP on waste classification describes four acceptable methods for

classifying wastes. The inspector should use this BTP as basic guidance in implementing this inspection requirement.

1. For those regulatees who use correlation factors for classifying wastes, correlation factors should be based on actual waste stream analysis.

2. Generic fuel cycle facility scaling factors are acceptable if actual sample analysis data correlate with the generic database. More specific scaling factors should be determined for the facility if, for example, uranium or plutonium has been contaminated with technetium and other by-product isotopes due to prior processing.

3. If generic scaling factors are not appropriate for an individual waste stream, scaling factors should be based on the specific waste stream data.

4. It is acceptable to base correlation factors on a single set of analyses, repeated annually.

5. If sample analyses have not been completed, calculation methods for scaling factors are acceptable while analyses are in progress. Samples should be offsite for analysis to be considered in progress. After receipt of the sample analyses, the regulatee may continue using calculation methods, provided the results correlate with the actual sample analyses.

6. NRC-approved topical reports for waste classification are acceptable for demonstrating compliance with 10 CFR 61.55.

The inspectors should review the license requirements for authorized release guidelines for byproduct materials transferred to unlicensed/uncertified persons. Chemical process byproducts in liquid and solid form such as ammonium hydroxide, hydrogen fluoride and calcium fluoride are frequently sold to unlicensed commercial customers. Depending on the facility and processes, uranium and plutonium release criteria will be specified in the license. These criteria and analysis supporting the releases should be reviewed for compliance with the license criteria.

03.04 Waste Form and Characterization. The inspector should determine the test methods and acceptability of such tests used by the regulatee to characterize his waste stream. In cases where a "high integrity container" is used to stabilize the waste, the type and acceptability of the specific container should be verified. The inspector should use the NMSS BTP on waste form as his basic guidance in implementing this inspection requirement. In addition:

1. Classes B and C solidified waste programs should contain test data on compressive strength, leaching, irradiation stability, biodegradation, and thermal stability. Results of tests should be consistent with the BTP on waste form. Test data packages that do not address all of the above areas may be acceptable, provided that testing is under way to complete the data package. A schedule for completion of the testing should be available for NRC inspection. Solidification media currently being used (cement, vinyl-ester-styrene, asphalt) are acceptable waste forms for shipment and burial, provided that qualification testing is in progress and there are procedures and controls in use to determine the consistent production of waste capable of existing as a free-standing monolith.

2. The regulatee's solidification process control program should incorporate the testing information from the solidification agent stability qualification.

3. NRC-approved topical reports on high integrity containers and solidification agents are acceptable for demonstrating compliance with 10 CFR 61.56(b).

4. A Certificate of Compliance issued by a State for a high integrity container is acceptable for demonstrating compliance for waste shipped to that State.

03.05 Waste Shipment Labeling. Inspectors as well as the regulatee should be aware that Classes A, B, & C wastes bear no relationship to Types A or B packaging for transport purposes under 49 CFR Part 173 or 10 CFR Part 71. The labeling of waste packages pursuant to this requirement is, therefore, in addition to any other package markings and labels required by the transport regulations.

03.06 Tracking of Waste Shipments. Inspectors should be aware of the differences in the requirements of Appendix G to 10 CFR Part 20 on waste manifest tracking for shipments by generators to waste collectors, as opposed to shipments directly to land disposal facilities. There are also some differences in the specific requirements of a waste collector who processes the waste before shipping it to the disposal facility, as opposed to a collector who simply stores the material before transferring it to the land disposal facility.

03.07 Disposal Site License Conditions. No further guidance.

SOLID WASTE STORAGE:

03.08 Management Controls and Surveys for Solid Waste Storage. Determine whether the procedures for placement, inspection and repackaging of LLRW are clear and available to all who need to use them, and that they have been approved by management. Confirm that inspections and surveys of stored LLRW have been performed at the required frequency and properly documented, and that the regulatee has conducted and properly documented all required effluent sampling. Review the results of inspections and surveys of LLRW in storage focusing on regulatee followup actions to problems identified. Check the regulatee's records on LLRW storage, determine whether the records provide accountability and determine how long LLRW has been in storage. Confirm that the regulatee is within authorized possession limits. Confirm that any required checks of fire protection systems have been performed.

03.09 Radioactive solid waste.

a. Check posting of storage areas and labeling of a selected number of containers. Check to determine that the regulatee's packages are clearly and properly labeled in accordance with 10 CFR 20.1904 and 20.1905, and that LLRW is transferred or disposed in accordance with 10 CFR 20.2006.

b. There may not be specific requirements included in the license, for 02.10 b. and c., however, they are required for compliance with 20.2001 and 20.2101, .2102, .2103, .2108, and .2110. Item 02.10 a. should be covered by regulatee procedures.

c. Examine a representative number of packages for signs of swelling, leakage, deformation or deterioration (i.e., rusting or other corrosion which may lead to breach).

03.10 Waste burial. If the regulatee buries noncontaminated waste onsite, e.g., in a landfill, determine whether a monitoring program exists which assures that the waste is indeed "nonradioactive." There may not be specific license requirements which cover the items in 02.11, however, these essential elements should be covered by regulatee procedures.

If low level radioactive material is buried onsite, determine that it meets the criteria contained in 10 CFR 20.2002, *Method for obtaining approval of proposed disposal procedures,* and 10 CFR 20.2108, *Records of waste disposal*. (Note: Prior to January

28, 1981, former regulatory criteria contained in 10 CFR 20.304, *Disposal by burial in soil*, permitted burial of small quantities of licensed/certificated materials in soil without specific Commission authorization, but records of the disposal were required to be maintained by former 10 CFR 20.401, *Records of ....disposal,* until the Commission authorized their disposition.)

03.11 Adequacy of Storage Area. Confirm that LLRW is stored in a restricted area and is secured against unauthorized removal. Check that waste containers are visible to allow routine inspection and that they are readily accessible to regulatee personnel. Confirm that the placement or stacking of containers is stable and that containers are not deformed under load, or likely to fall. Determine that ALARA considerations are used in the placement of the higher activity waste containers in the storage area. Check that the storage area is posted in accordance with 10 CFR Part 20 requirements.

Confirm that the containers are protected from reasonably expected environmental conditions, including fire and flooding, and that the storage location is not subject to extremes of temperature or humidity (i.e., near a boiler room, laundry area, etc.) Check ventilation of the storage area to determine if it is sufficient to prevent build-up of any gases produced by waste decomposition.

03.12 Earthen (surface) waste retention systems. Requirements should be stipulated in the license; the regulatee may refer to programs or controls contained in the license application.

88035-04 RESOURCES

An inspection performed using this inspection procedure is estimated to require 12 hours of inspector resources. This estimate is only for the direct inspection effort and does not include preparation for and documentation of the inspection. The estimate may vary depending on the complexity of the waste streams and the amount of solid radioactive wastes stored onsite.

88035-05 REFERENCES

10 CFR Part 20

10 CFR Part 61

10 CFR part 71

49 CFR Part 173

Federal Register, Vol. 48, No. 110, June 7, 1983, NRC Notice, *Low-level Waste Licensing Branch Technical Position Papers on Radioactive Waste Classification and Waste Form; Availability.*

Federal Register, Vol. 56, No. 18, January 28, 1991, NRC Notice, *Staff Technical Position on Radioactive Waste Form; Availability.*

Technical Position on Radioactive Waste Classification, mailed to all NRC licensees on May 11, 1983, by NMSS, Low-level Waste Management Branch.

Waste Form Technical Position Paper, Revision 1, mailed to all NRC licensees on January 24, 1991, by NMSS, Low-level Waste Management Branch.

Federal Register, Vol. 48, No. 175, Sept. 8, 1983; NRC Notice *Topical Reports in Support of the Implementation of Waste Classification and Waste Form Requirements.*

NRC Information Notice No. 89-13, *Alternative Waste Management Procedures in Case of Denial of Access to Low-Level Waste Disposal Sites*, February 8, 1989.

NRC Information Notice No. 90-09, *Extended Interim Storage of Low-Level Radioactive Waste by Fuel Cycle and Materials Licensees*, February 5, 1990.

NRC Information Notice No. 93-50, *Extended Storage of Sealed Sources*, July 8, 1993.

END