

# **NRC INSPECTION MANUAL**

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INSPECTION PROCEDURE 88035

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RADIOACTIVE WASTE PROCESSING, HANDLING, STORAGE,  
AND TRANSPORTATION

## 88035-01 INSPECTION OBJECTIVES

Determine whether the licensee's performance is in accordance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20 and 10 CFR Part 61 and in compliance with the license<sup>1</sup> application and commitments for the processing, handling, storage and transportation of radioactive waste.

## 88035-02 INSPECTION REQUIREMENTS AND GUIDANCE

### 02.01 Radioactive Waste Program.

- a. Inspection Requirements. Determine if the radioactive waste program is being implemented in accordance with the licensee's procedures, license application, and regulatory requirements.
- b. Inspection Guidance. Review organizational and procedural changes, training, plant incident reports, corrective action database, events, and any licensee self-assessments, audits or independent reviews performed since the last **Implementation Plan (IP)** 88035 inspection.

### 02.02 Organizational Structure.

- a. Inspection Requirements. Verify that any changes to the organizational structure in the area of radioactive waste are in compliance with license requirements, if applicable.
- b. Inspection Guidance.
  1. Interview licensee staff and management and review documentation to determine whether the organizational structure is consistent with the license requirements. Begin interviews with any managers who are new since the previous inspection.
  2. Determine whether these managers meet the training and experience requirements for their positions as specified in the license.
  3. Focus on whether the qualifications of assigned plant staff meet the requirements of the license or certificate, including years of relevant experience, educational background, and training required for the newly assigned responsibilities.

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<sup>1</sup> References to license or licensee should be understood to include facilities regulated under 10 CFR 76 with a certificate.

4. Examine changes in the organizational structure which impact personnel's qualifications, assigned responsibilities, and authority.

If no significant changes have occurred in the organization since the previous inspection, then limit time spent on this section.

#### 02.03 Procedures.

##### a. Inspection Requirements.

1. Verify that safety-significant changes to procedures in the area of radioactive waste are in compliance with license requirements.
2. Verify that safety-significant changes were made in accordance with the licensee's procedure revision process, if required by the license.

##### b. Inspection Guidance.

1. Review any safety-significant changes to procedures for the area being inspected since the last inspection. If there were safety-significant changes, review them to determine if they followed the procedure revision process regarding the following aspects:
  - (a) Only approved current procedures are used;
  - (b) Personnel affected by a procedure are adequately and timely informed of changes in the procedures;
  - (c) Changes to procedures, other than editorial and typographical, conformed with the Integrated Safety Analysis and had an engineering basis; and/or
  - (d) Whether any previously approved field changes have been incorporated into the changed procedure within an established time period.
2. If there were any new procedures developed for the area being inspected, determine if the development of the new procedures followed the procedure development process.

#### 02.04 Training.

##### a. Inspection Requirements.

1. Review training in the area of radioactive waste and evaluate if training is in compliance with license requirements.
2. Determine whether personnel designated by the licensee to certify radioactive material shipments (Subsection II of Appendix G to 10 CFR Part 20 and 49 CFR 172.204) are adequately trained and qualified.

b. Inspection Guidance.

1. Review area specific training to ensure that the following topics are included, as appropriate:

- (a) Items relied on for **safety**, process safety information elements (such as safety and health hazards, relevant material safety data sheets [MSDS], personal protective equipment, etc.);
- (b) Safe work practices (such as confined space entry, lockout/tagout procedures, opening process equipment, hot work, control of entry into hazardous areas, etc.);
- (c) Process technology (as required);
- (d) Operating procedures for all phases of operation;
- (e) Emergency procedures (such as Hazard Waste Operations and Emergency Response);
- (f) Reporting unusual events or non-routine operations;

Note: On-the-job training should, as a minimum, include: equipment familiarization, completing log sheets, equipment startup/shutdown activities, limiting operating conditions, control of process variables, and applying operating procedures in the field.

2. No guidance is provided<sup>2</sup>.

02.05 Problem Identification and Resolution.

a. Inspection Requirements.

- 1. Determine whether the licensee is identifying issues in the area of radioactive waste at an appropriate threshold and entering them into the corrective action program, if required by the license application.
- 2. Verify that the licensee is appropriately addressing and correcting safety-significant condition reports.

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<sup>2</sup> Per IMC 0040, 07.02(c) Note.

b. Inspection Guidance.

1. Perform a screening review to select a representative sample of items entered into the corrective action program. Identify safety-significant or repetitive failures that fall within the scope of the inspection. In addition, be alert to conditions, such as repetitive equipment failures or human performance issues that might indicate a trend or warrant additional follow-up.
2. Use direct observation of operations, discussions with relevant plant staff, and a sample review of applicable documentation to:
  - (a) Determine whether corrective actions commensurate with the significance of the issue have been identified and implemented by the licensee. Review a sample of issues to determine whether the licensee has appropriately classified the issue;
  - (b) Determine whether equipment, human performance, and program issues are being identified by the licensee at an appropriate threshold and are being entered into the problem identification and resolution program;
  - (c) Consider licensee identified issues (e.g., issues identified during audits or self-assessments) and issues identified through an employee concerns program, if applicable;
  - (d) Review a sample of safety-significant issues to determine whether the licensee has taken appropriate short- and long-term corrective actions;

02.06 Event Review.

- a. Inspection Requirements. Determine whether the licensee has implemented a program of review that evaluates safety-significant events in the area of radioactive waste and meets the license requirements.
- b. Inspection Guidance. Review the events occurring since the last inspection to determine compliance with the license including, as appropriate:
  1. The prompt review and evaluation of non-routine events and unusual occurrences to determine their significance;
  2. The reporting of events, both internally, and to the U.S. Nuclear Regulatory Commission (NRC) in a timely manner;
  3. Evaluation of the extent of condition of findings; and
  4. Completion of corrective actions related to non-routine events and unusual occurrences.

## 02.07 Audits.

- a. Inspection Requirements. Verify that the licensee has conducted audits or self-assessments in the area of radioactive waste and is in compliance with the license application.
- b. Inspection Guidance.
  - 1. Determine if the licensee is required to conduct audits or self-assessments. Select internal or contracted audits performed since the previous inspection, and examine the records documenting the selected audits. Determine whether there was a written plan for the audit, the audit adequately reviewed the specified area, the appropriate corrective actions were taken whenever deficiencies were found, and whether there was a check of the effectiveness of the corrective action(s).
  - 2. Determine by interviewing licensee representatives how the licensee ensures the effectiveness of audits, such as by use of contractor audits, use of a secondary (or follow-up) audit system on a periodic basis, conducted by a member of management or a senior technician not directly responsible for the system audited.
  - 3. Determine if safety-significant audit findings are being tracked to completion in the corrective action program.

## 02.08 Processing Systems.

- a. Inspection Requirements. Select one to three liquid or solid radioactive waste processing systems; including settling ponds. Walk down accessible portions of systems to verify and assess that the as-built system configuration and operation agree with the descriptions in the license.
- b. Inspection Guidance.
  - 1. Inspect radioactive waste processing equipment that is not operational and/or is abandoned in place.

Verify that the licensee has established administrative and/or physical controls (i.e., drainage and isolation of the system from other systems) to ensure that the equipment will not contribute to an unmonitored release path or affect operating systems or be a source of unnecessary personnel exposure.
  - 2. Verify that the licensee has reviewed the safety significance of systems and equipment abandoned in place in accordance with their engineering change process.

Review the adequacy of any changes made to the radioactive waste processing systems since the last inspection. Verify that changes from what are described in the license were reviewed and documented in accordance with their engineering change process.

3. Review the impact, if any, on radiation doses to members of the public.
4. Verify that settling ponds, retention basins, and/or earthen retention systems are in accordance with requirements in the license application.

#### 02.09 Quality Assurance.

- a. **Inspection Requirements.** Determine whether the licensee has established and maintains an adequate quality assurance (QA) program to determine compliance with the waste classification and characterization requirements.
- b. **Inspection Guidance.**
  1. Determine whether the QA program includes the required audits and management evaluation of such audits.
  2. Review the results of the most recent audit and corrective actions (Subsection III.A.3 of Appendix G to 10 CFR Part 20) if any, since the prior Inspection Procedure 88035 inspection.
  3. The written operating procedures and QA procedures of the licensee 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 licensee's QA program associated with the radioactive waste management program will vary depending on the nature and complexity of the specific waste streams encountered at a given fuel facility.

#### 02.10 Waste Classification.

- a. **Inspection Requirements.** Determine whether the licensee has established a program to identify and properly classify radioactive waste streams associated with plant operations in accordance with the requirements of 10 CFR 61.55 and the license.
- b. **Inspection Guidance.**
  1. Review the licensee's documentation and records of activities that have been established and are being maintained to determine whether 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).

2. Review the license requirements for authorized releases of radioactive nuclides in liquid and solid products transferred to non-NRC licensed entities to assure they meet the license and waste compact requirements. Waste compact requirements should be implemented in the disposal site license. Review whether the method used by the licensee is adequate to determine radionuclide concentrations in order to classify waste.
3. Review the license requirements for authorized release guidelines for byproduct materials transferred to unlicensed 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 the analysis supporting the releases should be reviewed for compliance with the criteria specified in the license.
4. Ensure that new waste streams and changes to existing waste streams have been properly classified and characterized. Review licensee procedures to determine if they address these changes.
5. Licensees may utilize the services of a contract analytical laboratory to analyze samples to determine waste stream classification. Under these circumstances verify that the licensee has established mechanisms to periodically evaluate the performance of the contractor analytical laboratory. These measures may include independent audits performed by the licensee or other qualified companies. Additionally purchase requisitions for contract services should be reviewed to ensure that appropriate performance standards and criteria have been included in the scope of the contract. This could include critical attributes such as the lower limit of detection or minimum detection level required to be achieved. Review the licensee's process for placing a company that supplies analytical services on their approved vendors list.

#### 02.11 Waste Characterization.

- a. Inspection Requirements. Determine if the licensee has established and implemented adequate methods to ensure the proper evaluation of radioactive characterization.
- b. Inspection Guidance. Review the licensee's documentation and records of activities which have been established and are being maintained to determine whether low level radioactive waste (LLRW) meets the waste characteristics of 10 CFR 61.56. (Subsection III.A.1 of Appendix G to 10 CFR Part 20).

#### 02.12 Waste Shipment Labeling.

- a. Inspection Requirements. Determine whether each package of radioactive waste intended for shipment to a licensed land disposal facility is labeled, as appropriate.

- b. Inspection Guidance. Review the licensee's procedures and records to determine whether each package of radioactive waste intended for shipment 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).

Inspectors should be aware that Classes A, B, and 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 10 CFR 61.57 is, therefore, in addition to any other package markings and labels required by the transport regulations in 49 CFR Part 173 or 10 CFR Part 71. Inspectors should note that the vast majority of radioactive waste shipments made by fuel facilities consist of Class A waste.

#### 02.13 Tracking of Waste Shipments.

- a. Inspection Requirements. Determine if the licensee has established a program for tracking the shipment and receipt of radioactive waste shipments.
- b. Inspection Guidance.
  - 1. Review the licensee'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.
  - 2. Determine whether acknowledgment of receipt of the manifest is obtained.
  - 3. Determine whether the licensee 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.
  - 4. 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).

Inspectors should be aware of the differences in the waste manifest tracking requirements of Appendix G to 10 CFR Part 20 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.

02.14 Disposal Site License Conditions.

- a. Inspection Requirements. Determine if the licensee has established measures to ensure compliance with disposal site license conditions for those burial facilities that the licensee utilizes.
- b. Inspection Guidance.
  - 1. Review the licensee's procedures and records to determine whether the applicable disposal site license conditions are being met.
  - 2. Determine whether the licensee has on file a current version of the disposal site license.

02.15 Radioactive Solid Waste.

- a. Inspection Requirements. Determine if the licensee has established measures to ensure the proper labeling and handling of solid radioactive waste storage containers while in interim storage prior to shipment and/or disposal offsite.
- b. Inspection Guidance.
  - 1. Check posting of storage areas and labeling of a selected number of containers. Check to determine that 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.  
  
There may not be specific requirements included in the license relating to the onsite storage of solid radioactive waste; however, the licensee's program should address the requirements of 10 CFR 20.2001 and 20.2101, .2102, .2103, .2108, and .2110.
  - 2. 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).
  - 3. Review the results of inspections and surveys of LLRW in storage focusing on licensee follow-up actions to problems identified.
  - 4. Review licensee records relating to LLRW storage, determine whether the records provide accountability, and determine how long LLRW has been in storage.
  - 5. Confirm that the licensee is within authorized possession limits.
  - 6. Confirm that any required checks of fire protection systems have been performed.

7. Confirm that accumulations of stored radionuclides of concern are less than Category 2 quantities or, if exceeded, appropriate increased controls have been implemented.

02.16 Adequacy of Storage Area.

- a. Inspection Requirements. Inspect the storage area(s) to determine the adequacy of:

1. Access control and security;
2. Access to, and housekeeping around waste packages. Adequate lighting should be provided to permit identification of unsafe radiological and non-radiological conditions;
3. Stable placement of waste or waste packages;
4. Protection from environmental elements, fire and flooding, avoidance of temperature/humidity extremes, and ventilation considerations;
5. Posting and labeling;
6. Segregation from hazardous materials; and
7. Waste minimization techniques;

- b. Inspection Guidance.

1. Confirm that LLRW is stored in a restricted area and is secured against unauthorized removal.
2. Check that waste containers are visible to allow routine inspection and that they are readily accessible to licensee personnel.
3. Confirm that the placement or stacking of containers is stable and that containers are not deformed under load, or likely to fall.
4. Determine that as low as reasonably **achievable considerations** are used in the placement of the higher activity waste containers in the storage area.
5. Check that the storage area is posted in accordance with 10 CFR Part 20 requirements.
6. Confirm that 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.).

7. Check ventilation of the storage area to determine if it is sufficient to prevent build-up of any gases produced by waste decomposition.

#### 88035-03 RESOURCE ESTIMATE

The resource estimate to perform this inspection procedure is estimated to be 32 hours every two years.

#### 88035-04 REFERENCES

10 CFR Part 20, Standards for Protection Against Radiation.

10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste.

10 CFR Part 71, Packaging and Transportation of Radioactive Material.

49 CFR parts 107, 171 through 180, and 390 through 397.

Inspection Procedure 84850, 'Radioactive Waste Management - Inspection of Waste Generator Requirements of 10 CFR Part 20 and 10 CFR Part 61,' December 22, 2008

Inspection Procedure 84900, 'Low Level Radioactive Waste Storage,' December 22, 2008

'Technical Position on Radioactive Waste Classification,' mailed to all NRC licensees on May 11, 1983, by NMSS, Low-Level Waste Management Branch, ML033630755.

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.'

'Waste Form Technical Position Paper,' Revision 1, mailed to all NRC licensees on January 24, 1991, by NMSS, Low-Level Waste Management Branch, ML033630746.

NRC Regulatory Guide 3.13, 'Design, Construction, and Inspection of Embankment Retention Systems at FuelCycle Facilities,' July 31, 2010, ML101470167.

NRC Information Notice No. 86-20, 'Low-Level Radioactive Waste Scaling Factors, 10 CFR Part 61,' March 28, 1986.

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.

NRC Regulatory Issue Summary 08-012, 'Considerations for Extended Interim Storage of Low-Level Radioactive Waste by Fuel Cycle and Materials Licensees,' May 9, 2008

NRC Regulatory Issue Summary, 11-009, 'Available Resources Associated With Extended Storage Of Low-Level Radioactive Waste,' August 16, 2011

NUREG-1608, Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects.

NUREG-1660, U.S.-Specific Schedules of Requirements for Transport of Specified Types of Radioactive Material Consignments.

#### 88035-05 PROCEDURE COMPLETION

Implementation of each applicable inspection requirement will constitute completion of this procedure. Individual inspection samples and breadth of review will be determined by the inspector based on requirement compliance, risk- significance of activity, and extent of the activity or records available.

END

Attachment:

Revision History Sheet for IP 88035

Attachment 1 - Revision History Sheet for IP 88035

| Commitment Tracking Number | Accession Number<br>Issue Date<br>Change Notice | Description of Change  | Description of Training Required and Completion Date | Comment and Feedback Resolution Accession Number |
|----------------------------|---|--|--|--|
| N/A                        | 09/25/06<br>CN 06-025                           | This document has been revised to: (1) emphasize the risk-informed, performance-based approach to inspection, (2) impose changes to the core inspection program based on operating experience, and (3) remove completed or obsolete MCs and incorporate other fuel cycle MCs into a central location.  | None   | ML061940414                                      |
| N/A                        | ML13233A179<br>02/07/14<br>CN 14-005            | The IP was significantly revised to provide for a more in-depth inspection. The revised IP focuses more on systems, while the current IP focuses primarily on radioactive waste storage. The inspections examine the overall program in more detail as aspects from MO and OT have been added to the IP. The inspection has been revised on a biennial frequency and with an estimated 32 hours of direct inspection. The previous IP edition annually required 12 or 16 hours of direct inspection. | None   | ML13347A944                                      |