



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NRC INSPECTION MANUAL

LLDR

INSPECTION PROCEDURE 84101

RADIOACTIVE WASTE MANAGEMENT

PROGRAM APPLICABILITY: 2560

84101-01 INSPECTION OBJECTIVE

To determine the adequacy of the licensee's radioactive waste management for the SAFSTOR or DECON option.

84101-02 INSPECTION REQUIREMENTS

02.01 Audits and Appraisals. Review the results of audits and appraisals performed by or for the licensee since the last inspection and the adequacy of the licensee's procedures, commitments, and corrective actions taken.

02.02 Changes. Review changes in equipment, facility, procedures and operations for liquid, airborne and solid waste systems. Determine whether changes are in accordance with 10 CFR 50.59 and license requirements.

02.03 Radioactive Liquid Effluents

- a. Determine compliance with effluent requirements and efforts to keep effluents ALARA.
- b. Determine by observation whether the liquid waste systems incorporate provisions to prevent and collect leakage, overflows, and spillage in accordance with the licensee approved safety analysis report.

02.04 Radioactive Airborne Effluents

- a. Determine compliance with effluent requirements and efforts to keep effluents ALARA.
- b. Determine whether normal and special ventilation exhaust system air cleaning units are maintained and operated as required by the license procedures and Technical Specifications (TS).

02.05 Instrumentation and Systems

- a. Determine whether process and effluent monitors are maintained, and calibrated as required by the license procedures and TS.

02.06 Radioactive Solid Waste

- a. Determine that the processing, control, and storage of solid wastes is in accordance with the license procedures, safety analysis TS, and applicable Federal and State regulations.
- b. Determine that the procedures for proper classification and characterization of wastes, for preparation of waste manifests, for marking packages with the class of waste, and for investigation of lost shipments are in accordance with regulatory requirements.

84101-03 INSPECTION GUIDANCE

03.01 Audits and Appraisals

- a. Review reports of required audits since the last inspection. Look particularly for those audits that probe for programmatic weaknesses and assess the quality of the program. Focus upon licensee follow-up actions for identified deficiencies. Are corrective actions timely and technically acceptable?

Requirements for reviews and audits normally are contained in the technical specifications for SAFSTOR. Audit teams should include someone knowledgeable in liquid and airborne effluents, solid wastes effluents and their associated systems. (Regulatory Guide 1.146 and ANSI/ASME N45.2.23-1978, Section 2.2)

03.02 Changes

- a. Discuss significant changes in equipment, facility, procedures and operations with cognizant management. (See IE Circular No. 80-18.) Determine whether changes in dose calculation methods in the Offsite Dose Calculation Manual (ODCM) have been implemented.

Review all the changes in effluent control procedures and equipment made since the last inspection and verify that:

1. they were made in accordance with the licensee's procedural control system and reviewed and approved by management and supervision, and
 2. they afford the same or a higher level of control of effluents as the procedures reviewed during previous inspections.
- b. Determine whether the licensee is following their effluent and solid waste control procedures.

03.03 Radioactive Liquid Effluents

- a. Briefly review Semi-annual Radioactive Effluent Release Reports for obvious mistakes, anomalous measurements, omissions and trends.
- b. Review selected records (including release permits) to determine compliance with effluent requirements. Verify dose calculations using the licensee's ODCM for a major nuclide (e.g., Cs-137 or Co-60) for one pathway for the last reporting interval.
- c. Review the licensee's experience in maintaining and using liquid waste process systems.
- d. Identify significant sources of radioactive liquids and solids released within and from the facility.
- e. Review the licensee's identification of significant sources of release and unmonitored release paths.
- f. Determine the volume of mixed waste being generated. Review mixed waste treatment methods.
- g. Briefly review selected records of required chemical and radio-chemical determinations for existing radioactive liquid systems. Verify whether these determinations have been performed as required and whether the results are within limits. The TS may require special limitations for spent fuel pools containing stored fuel.

03.04 Radioactive Airborne Effluents

- a. Briefly review the Semiannual Radioactive Effluent Release Reports for obvious mistakes, anomalous measurements, omissions, and trends.
- b. Review selected records (including release permits) to determine compliance with effluent requirements. Verify dose calculations using the licensee's ODCM for two major nuclides in two pathways for the last reporting interval. Plants that have been shut down for a long time may only have particulates released in their effluents.
- c. Review the licensee's experience in maintaining and using gaseous and particulate process systems.
- d. Identify the significant sources of radioactivity released within and from the facility.
- e. Look for unmonitored release paths.
- f. Review records of tests of required air cleaning systems. Identify recurrent test and maintenance problems and licensee's corrective actions, both long and short-term.

03.05 Instrumentation

- a. Requirements for calibrations are normally contained in the TS. Guidance on calibrations is contained in Regulatory Guides 1.21 and 4.15.
- b. Where possible, compare monitor readings with laboratory measurements to ensure that monitors respond acceptably.
- c. Observe remote and local process and effluent monitor readouts to determine operability. Identify recurrent maintenance problems.
- d. Process and effluent monitor alarm and control setpoints should be described in written procedures. The basis for each setpoint should be understood by affected operators and technicians.
- e. Review procedures for routine calibration and surveillance tests for all instrumentation.

03.06 Radioactive Solid Wastes Processing, Storage and Disposal

- a. Requirements for a process control program usually are contained in the TS.

IE Inspection Procedure 65051 covers the adequacy of construction of facilities for temporary onsite storage of low-level waste.

- b. Inspect selected processing and disposal records to determine whether quantity and radionuclide composition are being measured or estimated as required.
- c. Briefly review solid radwaste processing and storage reports for obvious mistakes, anomalous measurements, omissions, and trends.
- d. Review the licensee's experience in maintaining and using waste solidification systems.
- e. Inspect the operation of solid waste processing activities. Consider whether process or other engineering controls are being used to the extent practicable to limit airborne concentrations.
- f. If mobile waste solidification systems are used, determine by discussion and review of records whether the systems are tested before use, whether adequate communications exist with facility waste operators, and whether precautions have been taken to isolate and control inadvertent discharges because of leaks or malfunctions. Determine whether the integrity of the existing plant/mobile radwaste interface is tested periodically (e.g., system hydrostatic testing and visual checks for leakage). Determine how leakage is contained if it occurs. NRC Information Notice No. 90-31 provides information on the identification of problems with cement solidification, and reporting of waste mishaps.
- g. Prior to shipping low-level wastes for disposal, the licensee must have procedures properly approved by management for:

1. Classifying wastes pursuant to 10 CFR 61.55.
 2. Assuring that wastes meet the characteristics of 10 CFR 61.56.
 3. Preparation of shipment manifests pursuant to 10 CFR 20.2006(b).
 4. Assuring that each shipment manifest includes a certification pursuant to 10 CFR 20.006(c).
 5. Control and tracking transferred radioactive waste pursuant to 10 CFR 20.0006(d).
- h. Review procedures for segregation and packaging greater-than Class-C waste.
 - i. Review procedures for segregation and packaging mixed waste as defined by RCRA.
 - j. Review procedures for preventing creation of mixed waste.
 - k. Determine whether the licensee has established a quality assurance program to assure compliance with 10 CFR 61.55 and 61.56. Such a program must include management evaluation of audits pursuant to 10 CFR 20.2006(d).

84101-04 REFERENCES

10 CFR Parts 20 and 61

Facility Technical Specifications

Regulatory Guide 1.21, "Measuring and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled-Nuclear Power Plants."

Regulatory Guide 1.140, "Design, Testing, and Maintenance Criteria for Normal Ventilation Exhaust System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants."

Regulatory Guide 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components in Light-Water-Cooled Nuclear Reactor Power Plants."

Regulatory Guide 1.146, "Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants."

Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment."

NUREG-1301, "Offsite Dose Calculation Manual Guidance, Standard Radiological Effluent Controls for PWRs."

NUREG-1302, "Offsite Dose Calculation Manual Guidance, Standard Radiological Effluent Controls for BWRs."

NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants," 1978.

NUREG-0472, "Radiological Effluent Technical Specifications for PWRs," February 1980.

NUREG-0473, "Radiological Effluent Technical Specifications for BWRs," July 1979.

ANSI N13.1-1969 (R 1982), "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities."

ANSI N42.18-1980 (Reaffirmation and Redesignation of ANSI N13.10-1974), "Specification and Performance of Onsite Instrumentation for Continuously Monitoring Radioactivity in Effluents."

ANSI/ASME N5.2.23-1978, "Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants."

ANSI/ANS-55.1-1979, "Solid Radioactive Waste Processing System for Light-Water-Cooled Reactor Plants."

ANSI/ANS N55.4-1979. "Gaseous Radioactive Waste Processing Systems for Light-Water Reactor Plants."

ANSI/ANS-N55. 6-1979, "Liquid Radioactive Waste Processing System for Light-Water-Cooled Reactor Plants."

ANSI/ASME N509-1980, "Nuclear Power Plant Air Cleaning Units and Components (Revision of ANSI/ASME N509-1976)."

ANSI/ASME N510-1980, "Testing of Nuclear Air Cleaning Systems."

EPRI NP-2734, "Solid Radwaste Radionuclide Measurements," November 1982.

EPRI NP-2900, "Low-Level Radwaste Solidification," March 1983

IE Inspection Procedure 65051, "Low-Level Radioactive Waste Storage Facilities," January 1, 1983.

IE Inspection Procedure 84850, "Radioactive Waste Management - Inspection of Waste Generator Requirements of 10 CFR 20 and CFR 61."

IE Bulletin No. 80-10, "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment," May 6, 1980.

IE Circular No. 77-10, "Vacuum Conditions Resulting in Damage to Liquid Process Tanks," July 15, 1977.

IE Circular No. 77-14, "Separation of Contaminated Water Systems from Uncontaminated Plant Systems," November 22, 1977.

IE Circular No. 79-21, "Prevention of Unplanned Releases of Radioactivity," October 17, 1979.

IE Circular No. 80-14, "Radioactive Contamination of Plant Demineralized Waste System and Resultant Internal Contamination of Personnel," June 24, 1980.

IE Circular No. 80-18, "10 CFR 50.59 Safety Evaluations for Changes to Radioactive Waste Treatment Systems," August 22, 1980.

IE Circular No. 81-09, "Containment Effluent Water That Bypasses Radioactivity Monitor," July 10, 1981.

IE Information Notice No. 79-07, "Rupture of Radwaste Tanks," March 26, 1979.

IE Information Notice No. 79-09, "Spill of Radioactively Contaminated Resin," March 30, 1979.

IE Information Notice No. 82-43, "Deficiencies in LWR Air Filtration/Ventilation Systems," November 16, 1982.

IE Information Notice No. 82-49, "Correction for Sample Conditions for Air and Gas Monitoring," December 16, 1982.

IE Information Notice No. 83-52, "Radioactive Waste Gas System Events," August 9, 1983.

IE Information Notice No. 84-15, "Reporting of Radiological Releases."

IE Information Notice No. 84-72, "Clarification of Conditions for Waste Shipments Subject to Hydrogen Gas Generation."

IE Information Notice No. 84-94, "Reconcentration of Radionuclides Involving Discharges Into Sanitary Sewage System."

IE Information Notice No. 85-092, "Surveys of Wastes Before Disposal From Nuclear Reactor Facilities."

IE Information Notice No. 86-090, "Requests to Dispose of Very Low Level Radwaste per 10 CFR 20.302."

IE Information Notice No. 87-003, "Segregation of Hazardous and Low Level Radwastes."

IE Information Notice No. 87-007, "QC of Onsite Dewatering/Solidification Operations by Outside Contractors."

NRC Information Notice No. 90-31, "Update on Waste Form and High Intergity Container Topical Report Review Status, Identification of Problems with Cement Solidification and Reporting of Waste Mishaps," May 4, 1990.

Generic Letter No. 81-38 to all holders and applicants for operating licenses and construction permits, "Storage of Low-Level Wastes at Power Reactor Sites," and Enclosure, "Radiological Safety Guidance for Onsite Contingency Storage Capacity," November 10, 1981.

END