



Appendix EPS 60-T3

Radioactive Waste Collection, Storage, & Disposal

The Radiation Control Department (RadCon) follows standard practices to manage the collection and disposal of radioactive waste produced as a result of Jefferson Lab activities. Radioactive waste must be handled and stored with care in order to protect workers, the environment, and the public's health.

This appendix presents Jefferson Lab's program for the identification, collection, storage, and disposal of radioactive waste.

Radioactive wastes must be collected, catalogued, stored & disposed of through RadCon.

Routine rad waste activities (collection, monitoring, and storage) are coordinated through RadCon at 876-1743.



Key Roles

Radioactive Material Custodian (RMC)

- ❖ Identify radioactive components which must be stored for beneficial reuse
- ❖ Identify radioactive components no longer needed for Lab operations and are therefore considered radioactive waste
- ❖ Store and inventory items as “Saved for Beneficial Reuse” (SBR) in accordance with Chapter 4 of the RadCon Manual. For unique situations, contact the RadCon Manager for guidance.
- ❖ Ensure proper storage, segregation, and housekeeping practices are performed within Radioactive Material Areas.

Radiation Control (RadCon) Staff

- ❖ Identify components to be kept for Decay in Storage (DIS)
- ❖ Accumulate the radioactive waste in proper containment until pickup
- ❖ Monitor storage areas to ensure specifications are met
- ❖ Manage radioactive waste in compliance with applicable regulations
- ❖ Manage and oversee all waste transfer operations based on internal procedures
- ❖ Perform routine surveys of areas where rad waste is collected/stored
- ❖ Maintain records of all storage, monitoring, testing, and disposal of all radioactive waste, SBR and DIS



General Program

The management of radioactive wastes is described in RadCon's Administrative Procedure titled "Characterization, Certification, and Disposal of Radioactive Waste", SURA/CEBAF HPP-ADM-012.

Becoming radioactive waste

Radioactive waste is a generic term for low-level radioactive components and/or contamination control scrap generated as a result of Jefferson Lab accelerator operations that is no longer useful or is known to be waste. This material has no further use to the Lab and is suitable for disposal.

Radioactive materials, which are not in use or installed in a system, and are not SBR, shall be designated accordingly as waste. The waste shall be either held for DIS or declared waste and prepared for disposal. Waste held for DIS shall not contain tritium or other nuclides having half-lives greater than 120 days.

RadCon evaluates and obtains process knowledge from the Radioactive Materials Custodians (RMCs) to determine if materials are waste or not.

Radioactive Waste Collection Areas

Radioactive materials that are not in use or are no longer needed are collected in the following designated areas. (These locations produce the greatest radiological waste streams at Jefferson Lab.)

- Halls A, B & C
- The FEL
- The Accelerator near the MCC
- Building 52

Activities involving radioactive materials that might generate waste at other locations than those listed above are coordinated through RadCon. For example, the Test Lab (Building 58) does not have a designated collection area. RadCon gathers such job-specific possible radioactive waste materials and immediately takes them to Building 52.

Collection of Radioactive Materials

Each of the collection areas mentioned above has a RMC who also serves as the area radioactive waste coordinator. RMCs can classify their materials in one of two ways: as SBR or as radioactive waste. Only those materials designated as the latter are transferred to Building 52. [Halls A & C each have a large waste hopper that is used to collect their radioactive wastes. These containers are moved via forklift to Bldg. 52 where they are unloaded and subsequently returned to the Halls.] Materials deemed to be SBR must be stored in the appropriate Radiologically Controlled Area (RCA). Areas which produce the largest quantities of radioactive materials (such as Halls A and C) may require "satellite" storage locations, including transportainers, for storing their SBR material.



Other radioactive waste generators may store materials deemed as SBR in a mutually agreed upon location. SBR material shall be evaluated at least annually to verify continued need and assess radiological conditions. SBR items shall also be tagged and assigned unique identifying numbers for tracking purposes.

Materials are surveyed by RadCon prior to being removed from the storage areas or area of origin. When materials are surveyed, if there is actual or potential contamination, a smear test is conducted.

Processing, Storage, and Disposal

The waste is then segregated by physical characteristics, surveyed and repackaged as necessary, and given unique identification. Any special waste forms or potential mixed waste (radioactive waste that is also a hazardous waste) is segregated. The waste is physically characterized and radiologically assayed to determine the radionuclide content. Final packaging of radioactive waste is done in accordance with hazardous materials transportation regulations. Detailed information on each package's contents and radiological characteristics is recorded in a waste log and in electronic files. Packaged waste is stored in preparation for shipment at Building 52.

To prepare for a shipment of rad-waste, the RadCon Manager contacts the waste broker (currently Duratek, Inc.) to make the arrangements. RadCon forwards the radiological and physical data associated with the shipment to Duratek for review. Any questions on waste content or packaging are resolved prior to broker arrival. The broker arrives at Jefferson Lab, inspects the shipment, oversees loading of the vehicles, ensures correct placarding and labeling, and creates a waste manifest. The manifest is signed off by RadCon (as waste generator) and Duratek (certifying the shipment) and Duratek takes possession of the shipment. Upon arrival at the waste facility, the manifest is signed acknowledging receipt, and copies are forwarded to Jefferson Lab.

Miscellaneous

- ❖ Radiation areas and radioactive material containers must be properly marked, labeled, and posted. If a container has oil, for example, hazard labels are also used. The universal magenta and yellow tape, rope, signs, etc. are used.
- ❖ All liquid wastes at local storage locations as well as at Bldg. 52 must have secondary containment.
- ❖ Special wastes (such as lead, oil, and scintillation cocktail) must be handled and stored separately. Contaminated lead is considered a mixed waste and disposal is coordinated in conjunction with the Hazardous Waste Coordinator as described in HPP-ADM-012.
- ❖ RadCon provides quantity information to the ESH&Q Reporting Manager upon request for annual environmental reporting.

Records

- ❖ Radioactive waste logbook
- ❖ Radioactive waste disposal manifest
- ❖ Radioactive and contamination survey results
- ❖ Radio-assay records
- ❖ Rad waste database files.