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C-A OPERATIONS PROCEDURES MANUAL

8.20.2 Radioactive Waste Disposal

Text Pages 2 through 7

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
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Approved: _____ *Signature on File* _____
Collider-Accelerator Department Chairman Date

J. Scott

8.20.2 Radioactive Waste Disposal

1. Purpose

This procedure provides instructions for all C-A Department employees for the safe handling and disposal of radioactive materials.

2. Responsibilities

2.1 Each supervisor is responsible for ensuring that employees under their purview handle, accumulate, or dispose of radioactive waste, using adequate controls and documentation. Refer to SBMS Subject Area "[Radioactive Waste Management](#)", "[Transfer of Radioactive Materials Onsite](#)".

2.1.1 Each supervisor must ensure that the workers have appropriate training as per [SBMS Subject Areas](#).

2.2 Each employee shall minimize the amount of radioactive waste they generate and follow this procedure when disposing of such waste.

2.2.1 Each employee shall complete the necessary radioactive waste forms with the assistance of the C-A Environmental Coordinator (EC).

2.3 The C-A EC (Ext. 7520, pager 4234) shall:

2.3.1 maintain the Radioactive Waste Inventory Log,

2.3.2 perform radioactive waste container total curie content calculations, and

2.3.3 complete the Radioactive Waste Control Form.

3. Prerequisites

3.1 All employees and supervisors must be trained radiation workers.

3.2 All persons packing C-A radioactive waste bins must be trained by the BNL Hazardous Waste Management Group.

3.3 All persons transporting waste to Bldg. 960 must follow guidelines of SBMS Subject Area, "[Transfer of Radioactive Materials Onsite](#)".

3.4 Monthly survey of waste yard by Facility Support (FS) Tech is used to identify bin RAD levels. Contact FS (Ext. 4660) to survey waste bins and fill out labels prior to shipping to waste management.

3.4.1 Have FS place a radioactive material tag on each item or bag of waste.

3.5 Waste packing yard Bldg. 960 is located north of Bldg. 919B.

4. **Precautions**

Warning:

In the event of a spill contact Fire/Rescue at Ext. 2222 or 911 and report spill and the fact that it is radioactive material.

5. **Procedures**

Note:

Whenever practical, supervisors shall alert the EC during the weekly C-A Supervisors Meeting that significant amounts of radioactive waste will be generated.

5.1 **Request for Containers**

The C-A Environmental Coordinator (EC) maintains waste bins in the waste yard in Bldg. 960. Refer to section 5.3 for instructions on delivering waste to the yard. If a C-A Supervisor requires a bin in his/her area for waste, contact C-A EC Ext. 7520/(4234) to make arrangements.

5.2 When new containers are delivered from the Waste Management Division, the EC shall check and record each container number into the Radioactive Waste Inventory log.

5.2.1 Types of containers.

5.2.1.1 Bins 4' x 4' x 6' = 96 cu feet

5.2.1.2 55-gal. Drums 24" diam x 34" high = 7.5 cu feet

5.2.1.3 Land and Sea Containers 4.5' x 8' x 20' = 640 cu feet

5.2.1.4 Bin 3' x 8' x 13' = 312 cu feet

5.2.1.5 Bin 2' x 4' x 6' = 48 cu feet

5.2.2 EC shall record unique bin ID number provided by HWM.

5.2.3 EC shall assign ID numbers for 55-gallon drums.

5.3 The EC shall direct supervisors to segregate their C-A wastes (wood, plastic, ceramic, filters, copper, steel, aluminum, etc.), prior to delivering wastes to waste packing yard in Bldg. 960.

- 5.3.1 The new yard is fenced, locked, and posted as a Radioactive Material Area. Do not drop off wastes outside the fence. Contact Waste Management Technician, Ext. 7182, or pager 9032, or the Environment Coordinator, Ext. 7520, or pager 4234, to open yard for waste drop off.
- 5.3.2 The following are radioactive waste drop off requirements. If you cannot meet these requirements, contact individual in section 5.3.1 to determine what to do.

Note:
Refer to list of prohibited items in low-level waste packages [SBMS Radioactive Waste Subject Area](#). Light bulbs, lead, fuses, electrical equipment with solder, batteries, aerosol cans, chemical, and wet or liquid waste, has to be processed and bagged separately for handling.

5.3.2.1 In order to fit waste into containers, ensure long sections are no longer 4-feet. Large items that cannot be cut up will be dealt with prior to moving into the waste yard.

5.3.2.2 All soldered fittings, i.e. valves, flanges, etc., shall be cut out of piping and separated.

5.3.3 Brass and copper fittings from hoses and bus bar shall be cut off and separated. These fittings contain bronze and lead and are packaged separately from hoses and buss bar.

5.3.4 Separate bagged waste. Place compatible waste in separate bags from non-compatible waste. Also double bag all waste to minimize the possibility of an unintentional release of material.

5.4 General Waste Yard Procedures

5.4.1 Each waste bin placed in yard by Waste Management has a unique ID number on bin.

5.4.2 When bin arrives at yard, record bin ID number on a green inventory form and place in log book.

5.4.3 Prior to adding waste to bin, label bin as to waste stream and mark green inventory form the same. Waste streams: paper, copper and wire, aluminum, steel, filters, plastic & micarta, etc.

Note:

1. All waste delivered to waste yard must be surveyed by an RCT and dose communicated to packer, or have a ram tag with radioactive information attached. Any contaminated item shall have ram tag filled out as to contamination levels and be double bagged.
2. No activated item, >100 mr/hr, shall be brought to waste yard routinely. Coordinate with EC and FS Representative.
3. Bins shall remain closed (covered) except when loading waste.

- 5.4.4 Log all items and their weight on green bin inventory form as you put them in bin.
- 5.4.5 When bin is full, EC or Waste Management Technician fills out radioactive waste control form and places a radioactive waste sticker on bin with appropriate information.
- 5.4.6 RCT surveys bin in a low background area filling out both RAD sticker on bin, front section on (RWCF), and Rad Waste Program Form.
- 5.4.7 The bin is weighed and weight is recorded on RWCF and Rad Waste Program Form.
- 5.4.8 EC performs Rad Waste Program to characterize waste. Copy of isotope concentrations from Rad Waste Program, RWCF with isotope concentrations filled in, green inventory forms, and Rad Waste Program Form are attached. A copy placed in Rad Waste Log Book in EC Office. Original sent to Waste Management.
- 5.4.9 Waste Management shall coordinate pickup of completed waste bin.

5.5 Mixed Waste Packaging

- 5.5.1 A green inventory form shall be started for each drum of mixed waste being loaded. Drum and form will be labeled with a unique integer.

Note:

Ensure any liquid filled electrical component (capacitor) is verified PCB-free, and EC checks with Waste Management it can go in drum, or be bagged separately.

- 5.5.2 Drums are loaded as mixed materials are produced. Mainly brass fittings, copper valves and flanges soldered areas, electrical components with lead, fluorescent, and regular light bulbs.

- 5.5.3 Fluorescent and regular light bulbs will be crushed into their own drum using the bulb crusher. Wear safety glasses and gloves and ensure conex door is open for ventilation. Bulb crusher has a HEPA and charcoal filter.
- 5.5.4 When a drum is full, fill out radioactive waste control form and label drum with a mixed waste sticker.
- 5.5.5 Have RCT survey drum and fill out RWCF, mixed waste sticker, and Radwaste Program Form.
- 5.5.6 Weigh drum and record on RWCF and Radwaste Program Form.
- 5.5.7 EC shall use Radwaste Program Form to complete drum characterization and fill in isotope concentrations on RWCF.
- 5.5.8 Place a copy of completed RWCF, green inventory forms, Radwaste Program Form, and Isotope Concentration Form in Radwaste Records Log Book. Mail originals to Waste Management.
- 5.5.9 Waste Management shall coordinate pickup of full waste drums.
- 5.6 Waste Sorting Tqble (Waste Minimization)
 - 5.6.1 Bags of activated waste are inspected to ensure no prohibited items are in them.
 - 5.6.2 In 960 Enclosed Area a table is set up with a shielded area to allow sorting of waste.
 - 5.6.3 Bags are opened and sorted with a Ludlum or meter to separate activated items from clean.
 - 5.6.4 FS takes clean bags and performs an official survey that items are rad clean. Waste then is removed to normal garbage or suspect steel yard if its metal.
 - 5.6.5 Contaminated bags require FS coverage when bag is opened. All waste in bags goes into rad waste bins in this case. Inspection is only to ensure no prohibited items are in bags.

6. Documentation

6.1 Radioactive Waste Inventory Log Book

6.2 Calculation of Curie Content

7. References

7.1 BNL SBMS Subject Area "[Radioactive Waste Management](#)"

7.2 BNL SBMS Subject Area "[Prohibited Articles in Radioactive Solid Waste Packages](#)"

7.3 [BNL SBMS Subject Area "Transfer of Radioactive Materials Onsite"](#).

8. Attachments

None