

ADVANCED MEDICAL SYSTEMS OPERATING PROCEDURE

PACKAGING OF SOLID RADIOACTIVE WASTE

ISP-25 Rev. 1/95

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1.0 PURPOSE: To ensure that solid radioactive waste is safely and properly packaged in preparation for shipment.

2.0 PRECAUTIONS AND LIMITATIONS:

- 2.1 This procedure applies to all contaminated solid material that must be disposed of at an authorized radioactive waste disposal site.
- 2.2 All waste is to be compacted in order to reduce the volume unless a significant airborne hazard will result.
- 2.3 No liquid material is to be packaged. The waste disposal site will not accept liquids. Liquids must be solidified using approved methods prior to transportation.
- 2.4 Full face respirators should be worn when handling and compacting material which has been in the Hot Cell.
- 2.5 To reduce airborne contamination, material which has been in the Hot Cell should be bagged before extensive handling or compaction.
- 2.6 Waste is to be packaged on an ongoing basis. It should not accumulate.
- 2.7 This procedure requires that protective clothing and personal dosimetry equipment be worn.
- 2.8 A breathing zone air sample shall be taken during compactor operation to verify adequate respiratory protection.
- 2.9 Minimize stay time near high level waste materials.

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3.0 INSTRUCTIONS:

3.1 Compaction

- 3.1.1 Waste should be surveyed prior to compaction. Any material reading over 800mR/hr should be segregated and brought to the attention of the RSO.
- 3.1.2 After meeting all precautions and limitations, load the material into the compactor and compact it.
- 3.1.3 Once the compactor bag is filled, remove bag from compactor and tape down top flaps.
- 3.1.4 Survey the surfaces of the bag to insure that no part reads greater than 800mR/hr. If a reading is greater than 800mR/hr, mark the bag with the maximum radiation level found.

3.2 Packaging

- 3.2.1 Prepare a steel drum for loading by removing the lid, inserting a poly bag liner and placing the drum on kraft paper on the step off line in the air lock.

CAUTION: Be careful not to contaminate the drum.

- 3.2.2 A second individual, situated on the clean side of the airlock, is required for packaging.
- 3.2.3 Move the compacted waste bags out from the lab and place them inside the lined drum. Four bags will easily fit into one drum.
- 3.2.4 Survey the drum surfaces to insure that no reading is greater than 800mR/hr.
- 3.2.5 Fold the excess poly liner onto the top of the bags and replace the drum lid.

3.3 Contamination Control

- 3.3.1 Wipe down the drum exterior prior to surveying.

- 3.3.2 Smears of the drum exterior shall be taken and recorded on Form ISP-25A. Smears should be taken on the drum top and ring area, on the side of the drum and along the bottom of the drum.
- 3.3.3 No drum shall be removed from the airlock if any smears shows contamination in excess of 1,000 dpm/100cm².
- 3.3.4 If any smear indicates contamination greater than 1,000 dpm/100cm², then the drum must be decontaminated and resurveyed until the contamination levels are below the above limits.
- 3.3.5 If the drum surface contamination is below the limit, then it should be marked with an ID number and removed from the airlock to a low background area for surveying.

3.4 Survey

- 3.4.1 Survey the package surfaces and record on Form ISP-34A the highest readings found on the top, side and bottom surfaces. If the survey meter readings are in the upper 90% of the scale, the next higher scale should be used.
- CAUTION: Readings that fall within 20% of the maximum (800mR/hr) will be verified with at least one other instrument.
- 3.4.2 Mark the package hot spot with spray paint.
 - 3.4.3 Survey the package at a distance of one (1) foot from all surfaces. For purposes of documentation, divide the package into quadrants and record the highest reading in each quadrant on Form ISP-25A.
 - 3.4.4 Compute the average of the four (4) quadrant readings and record on Form ISP-25A.
 - 3.4.5 Survey the package at a distance of one (1) meter and record under Transport Index on Form ISP-34A.

NOTE: Not needed for LSA exclusive use.

3.5 Package Description

- 3.5.1 Apply a permanent ID number sticker to the package and record it on Form ISP-34A.
- 3.5.2 Weigh the package and record the weight.
- 3.5.3 Describe the contents of the drum (i.e. compacted trash, cell waste, cardboard, wood, used protective clothing, etc.).
- 3.5.4 Apply a "Class A Waste" label to the top of the package.

3.6 Storage

- 3.6.1 Transfer the package to the designated waste storage area and place it so that the ID number is readily visible.
- 3.6.2 High activity packages (greater than 200mR/hr contact) should be segregated from lower activity packages.

3.7 Documentation

- 3.7.1 Calculate the Curie content of the package using the 6CE formula following:

$$\text{mR/hr@1foot} = 6 \times \text{Curie content} \times \text{Gamma Energy}$$

$$\text{or Curies} = \frac{\text{mR/hr @ one foot}}{6 \times \text{Gamma Energy}}$$

EXAMPLE: For Cobalt-60

$$\text{Curies} = \frac{\text{mR/hr @ one foot}}{6 \times (1.33 + 1.17)} \quad \text{or} \quad \frac{\text{mR/hr @ one foot}}{15}$$

SOLID RADWASTE DATA SHEET

ISP-25A

Drum ID#: _____ Weight: _____

Contents: _____

SURVEY RESULTS

Meter used: _____ Ser.#: _____ Cal due: _____

Surface Readings

Top _____ mR/hr Bottom _____ mR/hr Sides _____ mR/hr

Readings @ 1 foot (by quadrants)

_____ mR/hr _____ mR/hr _____ mR/hr _____ mR/hr

Average 1 foot reading _____ mR/hr

Transport Index: _____ Curie content: _____ Ci

SURFACE CONTAMINATION

Top _____ dpm/100cm² Bottom _____ dpm/100cm² Sides _____ dpm/100cm²

Highest smear _____ dpm/100cm²

Performed by: _____ Date: _____

Reviewed by RSO: _____ Date: _____