

POOR ORIGINAL

IDO-10074, Rev. 1

CRITERIA FOR PACKAGING TRANSURANIC WASTE FOR RECEIPT AT THE
IDAHO NATIONAL ENGINEERING LABORATORY
RADIOACTIVE WASTE MANAGEMENT COMPLEX
OFFSITE GENERATED WASTE

August 1979

NUCLEAR FUEL CYCLE DIVISION
IDAHO OPERATIONS OFFICE

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LIST OF EFFECTIVE PAGES

The effectivity of each of the pages listed below is shown by its date of issue. A vertical bar in the right margin denotes data that have been changed or new requirements that have been added from that previously issued. Editorial changes are not sidelined. Insert changed pages; destroy superseded pages.

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SUMMARY

This document delineates the packaging criteria that must be adhered to for storage of transuranic (>10 nCi/g) waste at the Idaho National Engineering Laboratory. The Department of Energy, Idaho Operation Office (DOE-ID) will only accept transuranic waste from an offsite DOE location after a memorandum of agreement has been executed between DOE-ID and the cognizant DOE field office. Several memoranda of agreements are currently in effect. The detailed criteria in these previously approved memoranda of agreements are superseded by the criteria in this document.

For additional information on these criteria please contact:

Radioactive Waste Program Branch
Nuclear Fuel Cycle and Waste Management Division
U.S. Department of Energy
550 Second Street
Idaho Falls, Idaho 93401

Any deviations by the waste generator from the criteria stated herein must have prior approval of DOE-ID. In addition, DOE-ID will notify waste generators of any changes to the criteria prior to implementation.

1.0 INTRODUCTION

The Department of Energy, Idaho Operations Office (DOE-ID) has designated the Radioactive Waste Management Complex (RWMC) at the Idaho National Engineering Laboratory (INEL) for interim storage of transuranic waste materials in accordance with the AEC Manual, Chapter 0511, Radioactive Waste Management. EG&G Idaho Inc., operates the RWMC for DOE-ID under contract DE-AC07-76ID01570.

The implementation of AEC Manual, Chapter 0511, requires that specific areas within the RWMC be established for each category of transuranic material listed in Section 2.0 of this document. Each waste package is placed into its respective area upon initial receipt at the RWMC to meet the interim storage criteria. Some of these waste packages may undergo future processing at the INEL prior to shipment to meet the federal repository criteria.

The packaging criteria established by this document will permit efficient use of RWMC areas and will ensure that waste packaging meets the 20-year interim storage requirement at the RWMC. Additional requirements may be imposed to meet an additional 10-year minimum life requirement of the federal repository when they are established. Efficient utilization of RWMC facilities requires that the size and configuration of the waste packages be standardized to the extent practical.

Items contaminated with transuranic materials should be reduced to a size that will permit shipment in the containers listed in Section 4.0. Special authorization must be obtained prior to shipment of waste that does not meet the criteria stated herein.

The criteria for waste packaging contained in this document are based upon the current practices to the maximum extent possible. Studies are being conducted to help verify that the packaging criteria are adequate for handling and future processing. Changes in packaging criteria will be issued as changed pages or supplements to this document.

DOE-ID will consider requests from new DOE waste generators (those not covered by a current memorandum of understanding with DOE-ID) to ship transuranic waste to INEL on a case-by-case basis. In order for DOE-ID to accept transuranic waste from a new waste generator, the Manager or the cognizant DOE field office must submit a written request to the Manager, DOE-ID. The request must provide the following information: (a) description of the waste, (b) description of the packages, (c) an estimate of the number of waste packages and the tentative schedule for delivery, (d) justification for shipping the waste to INEL and a cost/benefit analysis if appropriate, and (e) method of shipment. If the packages are different from those authorized in Section 4.0 of this document, a detailed safety analysis on the packages must also be provided to DOE-ID for review. DOE-ID will evaluate the request and safety analysis and respond within 90 days if no additional data are required. If DOE-ID is agreeable to accepting the waste from a new DOE waste generator, a memorandum of understanding between DOE-ID and the cognizant field office will be issued.

Criteria are presented in conventional units because the federally standardized containers referred to are described in conventional units. An update of the criteria to metric units will be made when the container drawing dimensions are converted to metric units.

2.0 CLASSIFICATION OF OFFSITE-GENERATED WASTE

Two general classes of offsite-generated transuranic waste are acceptable for receipt at the INEL. These wastes are as follows:

- (1) Retrievable transuranic, low-level gamma waste (storage) - This waste contains transuranic elements in concentrations greater than 10 nanocuries per gram (nCi/g) of waste. Radiation readings are less than 200 mrem/h at the package surface.

- (2) Retrievable transuranic, intermediate-level gamma waste (storage) - This waste is contaminated with transuranic elements in excess of 10 nCi/g of waste and less than 100 g of transuranics per 30-gal package. Radiation readings are greater than 200 mrem/h but less than 30 rem/h at the package surface.

3.0 GENERAL CRITERIA

Shipment of radioactive waste generated offsite must contain transuranic material as defined in Section 2.0. Beta-gamma waste will not be accepted at the INEL RWMC. All news releases pertaining to shipment or receipt of offsite wastes must have the prior approval of DOE-ID.

To allow appropriate planning for future waste shipments, forecasts of waste volume per waste classification and approximate number and types of waste packages shall be provided to DOE-ID and WMP Information and Coordination Project EG&G Idaho, Inc., WMO-601. Forecasts are to be prepared for a 3-year period, divided into 6-month increments, i.e., July 1 thru December 31, January 1 thru June 30. These forecasts shall be upgraded annually and are due to DOE-ID on or before November 15. The Waste Management Program (WMP) uses these forecasts to evaluate waste reduction performance and to project manpower, equipment, and storage area requirements.

The waste generator shall have budgetary responsibility for all costs necessary to deliver waste shipments to the INEL RWMC. Normal waste handling and storage activities at INEL are not charged to the waste generator.

The following criteria apply to all transuranic waste shipped to INEL:

- (1) Materials prohibited from receipt for storage at the RWMC are:
 - (a) Vessels pressurized greater than 1 atmosphere
 - (b) Vessels containing radioactive gaseous waste
 - (c) Pyrophoric material having dimensions less than a 0.25 in. cube (i.e., pyrophoric chips, turnings, and particles)

- (d) Liquid metals
 - (e) Acidic waste less than 4 pH or caustic waste greater than 11 pH
 - (f) Elemental alkaline metals
 - (g) Explosives
 - (h) Fuel assemblies and first stage raffinates from fuel processing facilities
 - (i) Other reactive materials that could cause a fire, explosion, or pressure buildup in the waste packages.
- (2) Free liquids, meaning any liquids which are not immobilized or absorbed, are prohibited from receipt at the RWMC in any transuranic waste as defined by AEC Manual, Chapter 0511.
 - (3) The waste generator must load the containers to ensure that the interior volume is efficiently and compactly loaded with radioactive material. Such high density loading will reduce the number of radioactive shipments by the waste generators and enhance space utilization at the RWMC.
 - (4) All organic material must be prepared for disposal by dehydration or by the addition of sufficient preservatives and desiccants to prevent bacterial action, significant gas buildup, or the formation of free liquids prior to shipment.
 - (5) Radioactive gases must be chemically reduced or oxidized or absorbed in charcoal to prepare them for storage.
 - (6) Materials that could lead to spontaneous combustion (strong oxidants in combination with solidified oil, greases,

solvents, or other materials) shall not be combined in a waste package.

- (7) Waste shipments shall be accompanied with the documents identified in Section 6.0.
- (8) Waste generators with accountable nuclear materials for shipment to the RWMC shall contact EG&G Safeguards and Security Branch at 526-2372 (FTS 583-2372) to ensure that the proper documents are completed prior to shipment.
- (9) Radiation levels defined in this criteria shall be verified with a calibrated, 2-1/2 in. minimum diameter, ion chamber radiation survey instrument.
- (10) Combustible and noncombustible waste shall be segregated and packaged separately. Waste packages loaded with combustible waste shall be marked with a bright green, 4-in., equilateral triangle painted on or adhered to the package. Each drum shall be labeled at three places around the sides; boxes shall be labeled on each of the four sides to be plainly visible to forklift operators during handling.
- (11) The exterior of all packages must be reasonable free of dirt, moisture, rust, and removable surface contamination. Surface contamination on each package shall be less than 2200 dpm/100 cm² beta-gamma and less than 220 dpm/100 cm² alpha. The costs associated with the correction of rust problems, decontamination, or cleaning of waste packages prior to storage may be billed to the waste generator.
- (12) The waste generator shall package all waste to minimize gas buildup. The amount of activity on hydrogenous materials must be restricted to less than 4×10^5 nCi of alpha activity per gram of waste, provided the total activity in a

55-gal waste package does not exceed 14.6 Ci. This quantity corresponds to about 200 g of weapons grade Pu, or 1 g of heat source grade ^{238}Pu in a 55-gal waste package (200 g fissionable material limit). The maximum curie limit for containers of different sizes is considered to be directly proportional to the fissionable material limit. The total activity permitted in a 30-gal waste package (100 g fissionable material limit) would be 7.3 Ci.

- (13) Waste package specifications and other waste handling changes that may affect 20-year storage integrity must have approval of DOE-ID prior to implementation.
- (14) Each waste package shipped to the RWMC shall be labeled as follows: Packages for retrievably stored waste shall have an identification number affixed in such a manner as to be intact and legible after a 20-year storage period. The identification number is to be placed near the top of the package and be clearly visible. The identification number must correspond to that listed on Form ID-137, defined in Section 6.0 and Exhibit 3. The security seal number and identification number may be the same, provided the criteria of each are met. The only other markings required on the waste package are that required by the Department of Transportation (DOT) for the shipment of the waste package (i.e., gross weight, package type, radioactive material label, name of radioactive material, etc.). The only information permitted on the waste package is that required to describe the container and its waste contents as described herein.
- (15) Transuranic waste shall be segregated from nontransuranic waste and packaged for retrievable storage in 20-year-integrity containers in accordance with AEC Chapter 0511.

(16) The radioactive thermal decay energy must not exceed 10 W per package.

(17) Fissionable material gram limits stated in Tables I and II are based on criticality limits at the RWMC. These gram limits do not pertain to packages containing only irradiated natural or depleted uranium waste which are criticality safe in any configuration. Fissionable material is defined in ERDA Manual, Chapter 0530.

4.0 STANDARD CONTAINERS

Standardized containers are used at the INEL RWMC. These containers are designed to provide safety, integrity, and improved use of space at the RWMC. The following containers are approved by DOT and DOE-ID for use at the INEL. DOE-ID will provide the procurement specifications, noted below, upon request. Containers must be painted as specified in the procurement specifications. Drum procurement specifications include the head gasket procurement requirements.

- (1) The DOT 17C 55-gal drum, per procurement specification ES 50365, is a standard steel drum constructed of 16-gauge materials with a removable head (Figure 1). Drum head gasket is per procurement specification ES 50348.

- (2) The DOT 6M packaging consists of a DOT 17C 55-gal drum with fiberboard centering media and a DOT specification 2R inner containment vessel (Figure 2). DOT 6M packaging is acceptable at the INEL for storage only when the drums have no mechanism for venting. This requires the waste generator to obtain approval for modification to the DOT 6M packaging which may be obtained when the 6M package is shipped inside another DOT-approved transport device.

The DOT 2R, or equivalent, containment vessel must be made of stainless steel, malleable iron, brass, or other material having equivalent physical strength. The vessel shall be less than 25-3/4 in. overall length and have a maximum outside vessel diameter of 5 in.^a Ends of the vessel must be fitted with a closure or flanges made of welded or brazed plate. The new waste generator must submit the details of the 6M packaging, including the 2R containment vessel to DOE-ID and EG&G WMP-0 for information prior to usage.

a. 5-in. schedule 40 pipe has been approved for Bettis Atomic Power Laboratory shipment.

- (3) The DOT 17H 30-gal drum, per procurement specification ES 50421, is a standard steel drum constructed of 18-gauge material with a removable head (Figure 3). Drum head gasket is per procurement specification ES 50442.
- (4) The DOT 7A wooden box, per procurement specification ES 50424 is a flush-panel plywood box with internal stiffeners (Figure 4). Packaging of TRU waste per Section 5.0, Table II, requires the box to be coated with 1/8-in. fiberglass per procurement specification ES 50376, as shown in Figure 5.
- (5) The DOT 7A steel box, per procurement specification ES 50393, is a 50-3/8 x 58-3/8 x 72-3/8 in. rectangular steel box used for shipment of waste in non-DOT-approved containers or as an overpack in the shipment of DOT-approved containers (Figure 6). When used as an overpack, it will hold eight 17C 55-gal drums in two layers of four drums each, or twelve 17H 30-gal drums in two layers of six drums each. This box does not require a security seal when it is used as an overpack provided each of the DOT-approved inner packages contain a security seal.
- (6) Refer to Section 8.0 for the use of containers that do not meet the above criteria.

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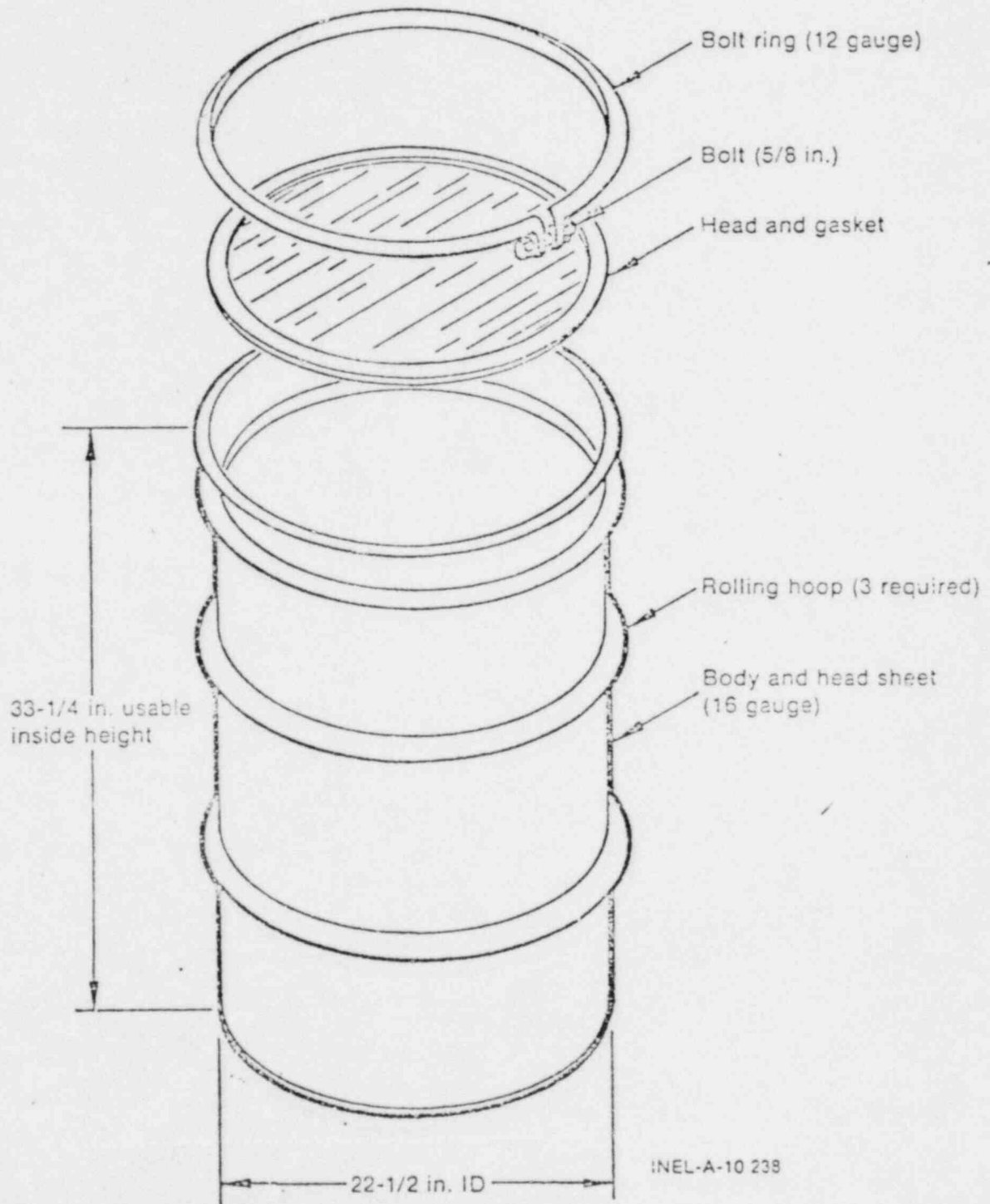


Fig. 1 DOT Spec 17C steel drum (55-gal).

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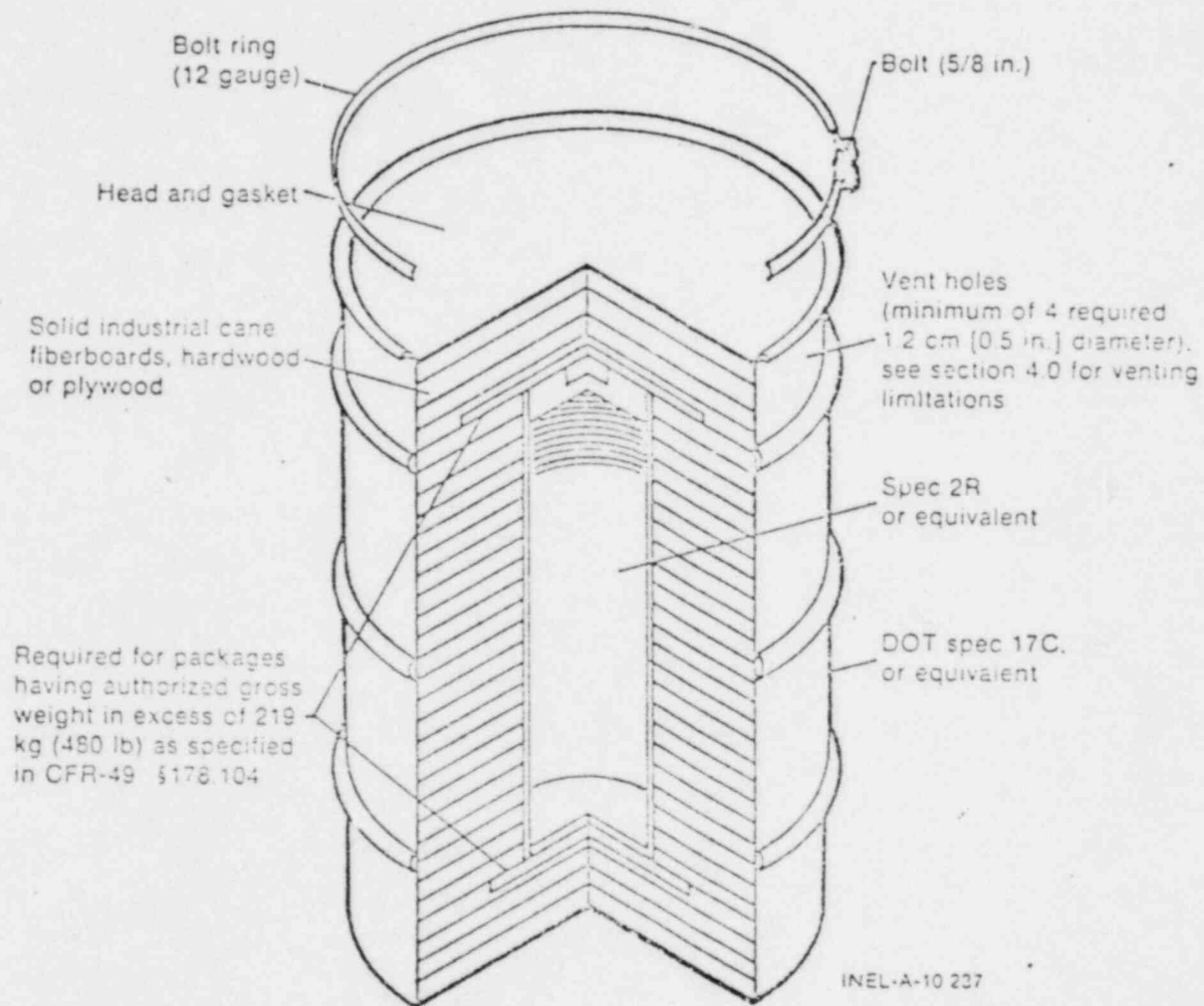


Fig. 2 DOT Spec 611 packaging.

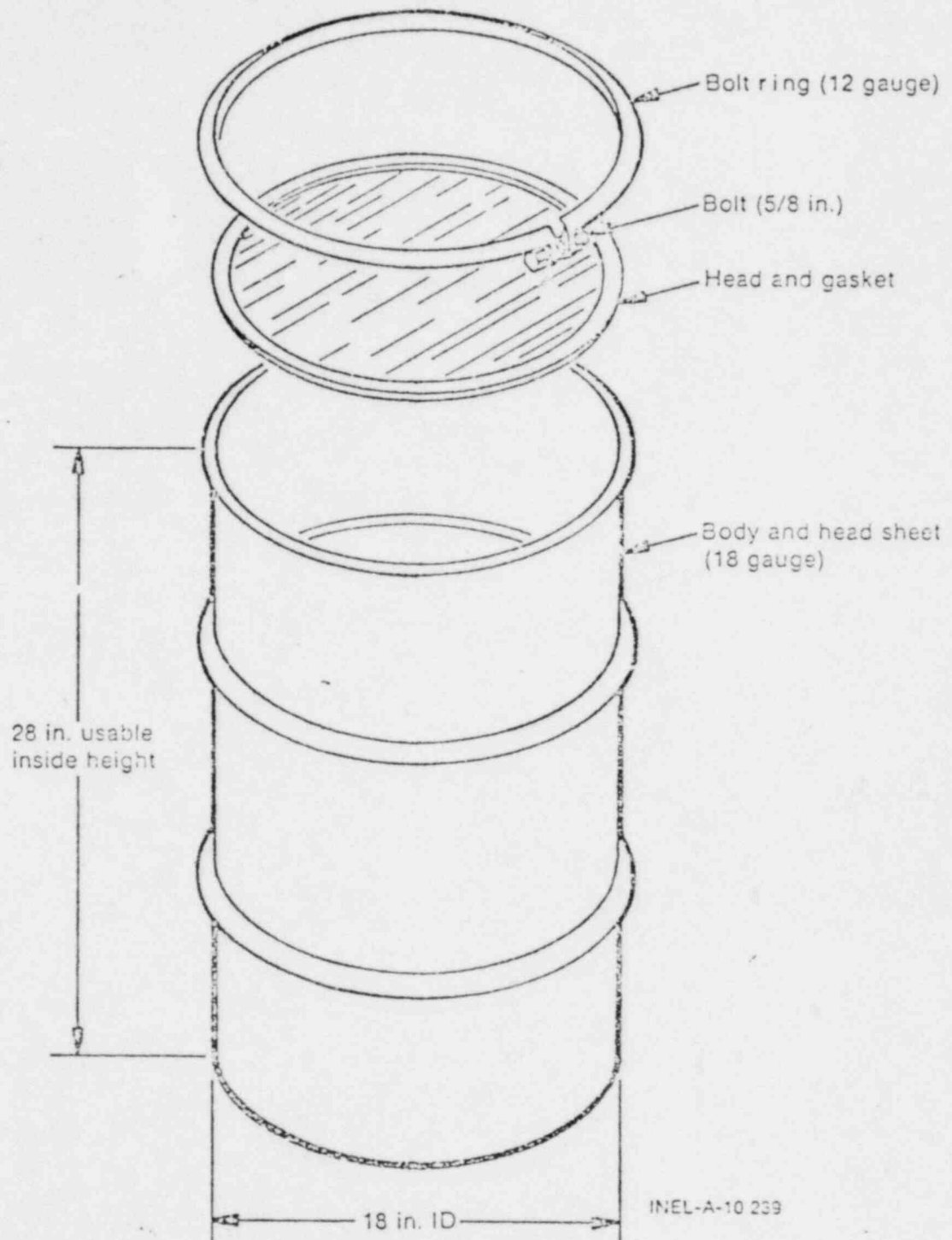


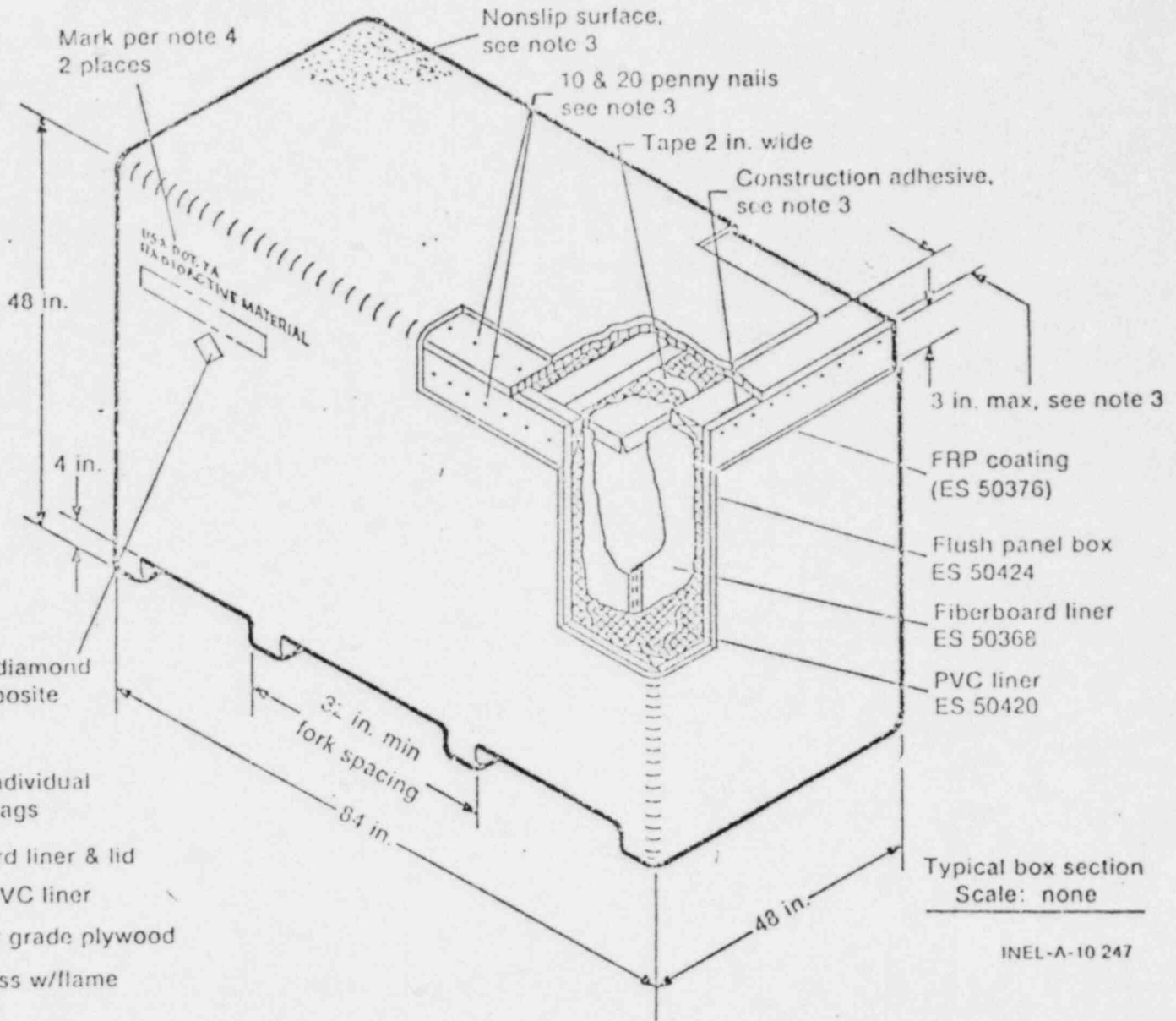
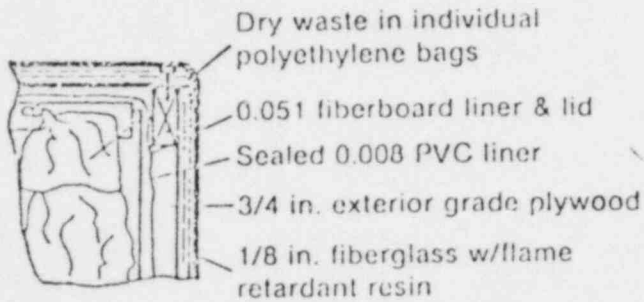
Fig. 3 DOT Spec 17H steel drum (30-gal).

NOTES

1. Securely block large, heavy items within the box to prevent movement. Tightly pack other material in individual plastic bags as appropriate. All material shall be free of liquid.
2. Place lid on fiberboard liner, fold over PVC liner and seal with tape.
3. Fasten lid on box using construction adhesive and cement coated nails per the applicable box assembly drawing. Add FRP coating per ES 50376 in area 3 in. either side of joint to seal box. Spray top of box with a light coat of resin and distribute about 1 quart of fine gravel into wet resin to provide a nonslip surface.
4. Durably and legibly mark "USA DOT 7A", "RADIOACTIVE MATERIAL", name and address of user and gross weight using characters at least 1.0 in. high, 2 places, on opposite sides of box.
5. All dimensions are in inches and are given for reference only. See the applicable box engineering drawing for details. Flush panel box shown. Boxes may be ordered in two heights. See table for sizes.
6. When using 24x48x84 in. box, cut fiberboard and PVC liners to fit.

Nominal box size (in.)	Overall height (in.)
48x48x84	52
24x48x84	28

Radioactive material diamond label, 2 places on opposite sides of box



Typical box section
Scale: none

INEL-A-10 247

Fig. 5 DOT 7A fiberglass reinforced flush panel box assembly.

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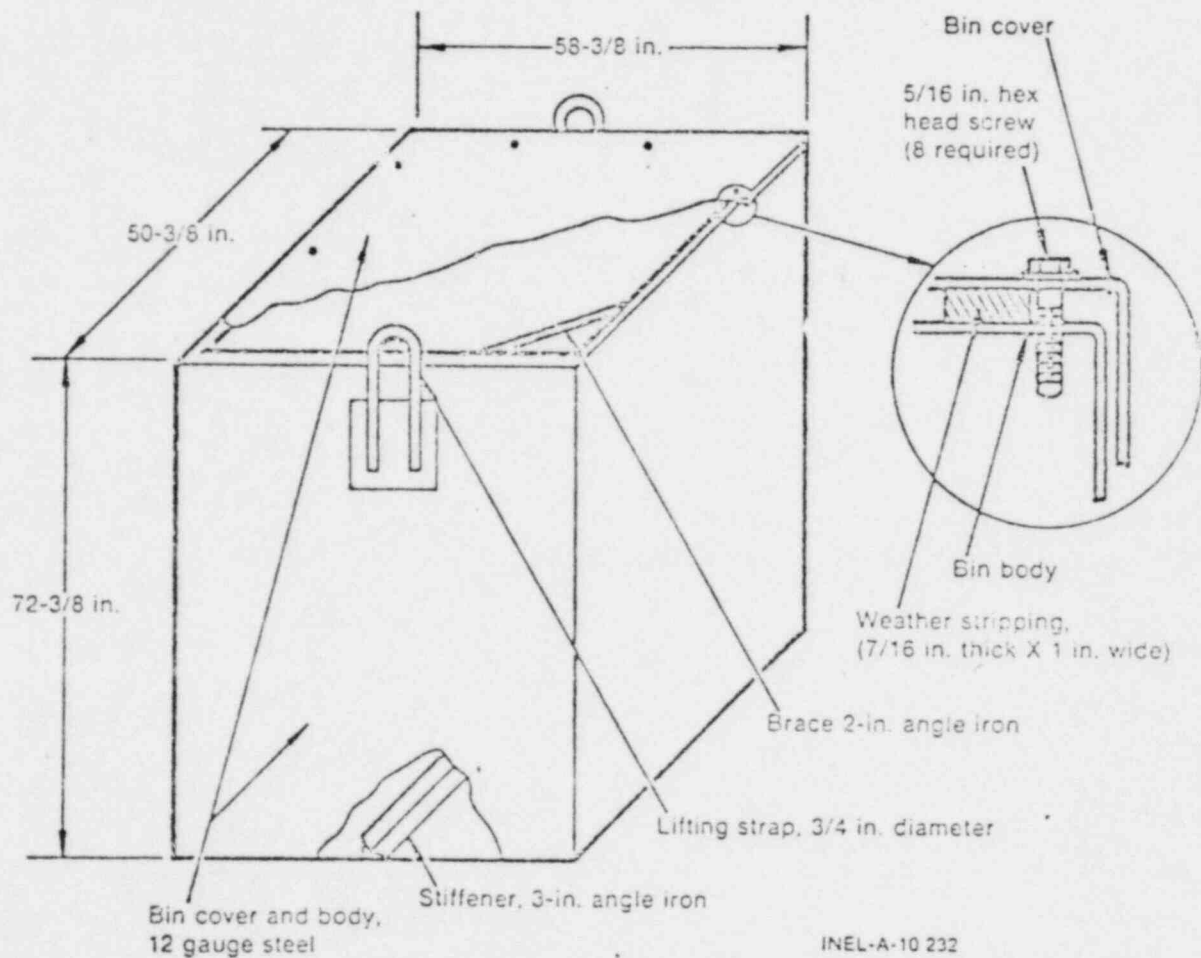


Fig. 6 DOT Spec 7A steel box.

5.0 PACKAGING CRITERIA

Tables I and II provide specific packaging criteria for each of the two general classifications of waste described in Section 2.0. These criteria along with the associated general criteria given in Section 3.0 provide the requirements for acceptable packaging on which waste will be accepted at the INEL.

Preplanning the loading of each package is essential not only for reduction of waste shipments to INEL but also for proper use of the space required for storage. The storage space at the INEL is limited; consequently, volume reduction at the waste generators' facilities must receive increased emphasis.

Each waste package shall be prepared for shipment so as to minimize damage during transit. Minor damage incurred during transit, not attributable to poor packaging, will be repaired at the INEL without charge to the waste generator. Damage caused by waste generator or carrier negligence may be backcharged to the waste generator.

TABLE I

APPLICABLE TO WASTE CLASS 1^a
 RETRIEVABLE TRANSURANIC, LOW-LEVEL GAMMA WASTE (STORAGE)

Characteristics	DOT 17C 55-gal Drum	DOT 6M Packaging	DOT 7A steel Box	DOT 7A Fiberglassed Box ^b
Gross weight limit	800 lb/drum	640 lb/drum	3200 lb/box	10,000 lb/box
Dimension limit	55-gal drum	55-gal drum	50-3/8 x 58-3/8 x 72-3/8 in.	4 x 4 x 7 ft 2 x 4 x 7 ft
Radiation at surface	<200 mrem/h	<200 mrem/h	<200 mrem/h	<200 mrem/h
Fissionable material content	<200 g/drum	<500 g/drum	<60 g ²³³ U or Pu <100 g ²³⁵ U	177 g/m ³ of waste volume; average and 350 g/box maximum
Transuranic & ²³³ U content	>10 nCi/g	>10 nCi/g	>10 nCi/g	>10 nCi/g
Liner	90-mil rigid poly liner ^c	DOT 2R inside containment vessel ^d	Rigid inner containers(s) ^e	Fiberboard liner and continuous 8-mil poly film, as a minimum, sealed with tape
Security seal	Yes ^f	Yes ^f	Yes ^g	Seal provided in fibreglassing
Lid gasket	Watertight ^h	Watertight ^h	Watertight ⁱ	Seal provided in fibreglassing

TABLE I (continued)

Special Instructions:

- a. See Section 2.0.
 - b. Refer to Figure 4 for requirements on placement of liners, and final fibreglassing of the wooden container.
 - c. The rigid poly liner used, per procurement specification ES 50357, shall be used inside the DOT 17C drum and shall be sealed with an adhesive, per procurement specification ES 50359, or equal.
 - d. See Standard Container (Section 4.0) for the special approvals required prior to using the 6M packaging criteria.
 - e. Non-DOT approved container(s) (i.e., wooden boxes, 55-gal drums, metal cans etc.) used inside the DOT 7A steel box shall be constructed of materials sufficiently rigid to preserve the integrity of the loaded package under normal handling and shall be sealed. Wastes shall be suitably packaged before placement in DOT 7A box to provide double containment.
 - f. Each drum shall be sealed by the shipper with a numbered seal so to preclude removal of the lid without destroying the seal. Sealing methods include spot welding a numbered stainless steel strap across the tight end closure or placing a numbered, padlock-type, stainless steel/plastic seal through a hole in the bolt of the closure within 1/2 in. of the tightened closer lug. Closure ring bolts shall be torqued a minimum of 40 ft-lb prior to sealing.
 - g. Each steel box shall be sealed with a numbered seal in such a manner as to preclude removal of the lid without destroying the seal provided each inner package is not sealed per Note f. Acceptable sealing methods include: (1) spot welding two straps from box to lid on opposite sides of the box (placing a numbered seal around one welded strap) and, (2) placing a numbered, padlock-type, stainless steel wire and plastic seal through a hole in the head of each of two bolts adjacent to the lifting ears and around one side of each lifting assembly.
 - h. The lid gasket shall be coated with Permatex #2 nonhardening adhesive, or equivalent, applied to seal areas at final closure.
 - i. The lid to the DOT 7A steel box shall contain weather stripping 7/16 in. thick, 1 in. wide.
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TABLE II

APPLICABLE TO WASTE CLASS 2^a
RETRIEVABLE TRANSURANIC, INTERMEDIATE-LEVEL GAMMA WASTE (STORAGE)

NOTE: Waste in this category shall be packaged and labeled to meet the proposed federal repository criteria. The following criteria are provided for guidance as minimum requirements.

<u>Characteristic</u>	<u>DOT 17H 30-Gal Drum</u>
Gross weight limit	200 lb/drum
Dimension limit	30 gal drum
Radiation at surface	>200 mrem/h to <30 rem/h (upper limit based on free air transfer at INEL)
Fissionable material content	<100 g
Transuranic & ²³³ U content	:10 nCi/g
Inner container	Watertight sealed metal, 26 gauge min wall thickness or polyethylene containers 0.150 in. min thickness enclosed in a sealed 0.020-in.-thick PVC sleeve
Liner	Puncture proof liner, 0.100 in. min wall blow molded polyethylene liner with 1/16-in.-thick, min plain disc cover ^b enclosed in a sealed 0.020-in.-thick sealed PVC sleeve.
Security seal	(c)
Drum head gasket	(d)

a. See Section 2.0.

b. Puncture-proof liner obtainable from Container Corporation of America, Plastics Division, 30-gal CK Tank #1829.

c. Each drum shall be sealed by shipper with a numbered seal to preclude removal of head without destroying seal. Sealing methods include spot welding a numbered stainless steel strap across the tight end closure or placing a numbered, padlock-type, stainless steel/plastic seal through a hole in bolt of closure within 1/2 in. of tightened closure lug. Closure ring bolts shall be torqued a min of 40 ft-lb before sealing.

d. Drum head gasket shall be coated with Permatex #2 nonhardening adhesive, or equal, applied to the seal areas at final closure.

6.0 DOCUMENTATION REQUIRED

A bill of lading or Form ID-109-A, (Exhibit 1) is required for each shipment.

The original and one copy of a completed Form ID-135, (Exhibit 2) and Form ID-137, (Exhibit 3) shall accompany each shipment. The data required by Form ID-137 may be furnished by alternate methods (computer tapes) if approved by DOE-ID and EG&G WMP-0. These documents should be addressed to:

Manager
Waste Management Program Operations Project
EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, Idaho 83401

When accountable source and special nuclear material is involved, DOE Form 741, (Exhibit 4) shall be executed and forwarded to EG&G Safeguards and Security Branch on the day of the shipment or on the first working day after the shipment, should it occur on a nonworking day.

7.0 TRANSPORTATION

Each waste generator shall be responsible for compliance with all pertinent DOE and DOT shipping regulations. Shipments can be received at INEL by either rail or truck. Criticality control of the shipment shall be the waste generator's responsibility.

Shipment of drums by rail shall be by series 600 ATMX railcars, with cargo carriers to expedite unloading. Series 500 ATMX railcars may be used only after authorization by DOE-ID. Mound Laboratory is authorized to continue shipment of drums in the series 500 ATMX railcar.

Shipment of fiberglass-coated boxes may be made by either series 500 or series 600 ATMX railcars.

Scheduling and notification of shipments shall be coordinated between EG&G Traffic Department and the shipper's traffic department.

8.0 EXCEPTIONS OR NONSTANDARD SHIPMENT REQUIREMENTS

DOE-ID must approve all exceptions to the criteria specified in this document prior to shipment. A safety analysis will be required for exceptions that increase the fissile loading, affect the container 20-year integrity, or cause any other significant areas of noncompliance.

The waste generator shall, as a minimum, include the following information with his requests for shipment of radioactive waste:

- (1) Drawings of waste packages, if different from the standard packages described by this document, and a description of the number of containment systems. All containers must have sufficient structural integrity to withstand a uniformly distributed load of 750 psf which is required to support other waste packages and earth cover without crushing during the stacking and covering operations. In addition, the waste package must be suitable for handling with a mechanical unit, such as a forklift
- (2) DOT specification number, NRC certificate of compliance number or, DOE certification of compliance number of the shipping configuration
- (3) Definition of how package meets 20-year life requirement
- (4) Method of sealing the package which will be destroyed if removed and will provide evidence that the package has not been opened
- (5) Types and kind of waste to be shipped
- (6) Estimate of radiation level at package surface and at 3 ft from package and confirmation that loose contamination will not exceed the criteria stated in Section 3.0

- (7) Types and quantities of toxic materials (other than radioactive) as defined in "Dangerous Properties for Industrial Material," Library of Congress catalog 74-17275
- (8) If unstable materials are to be included in the waste shipments, the specific method that must be used to make the material inert shall be included
- (9) Estimated transuranic content, in nanocuries per gram, based on total activity and weight of waste package as defined in AEC Manual 0511
- (10) Quantity in grams, of fissionable material to be shipped - fissionable material is defined in ERDA Manual, Chapter 0530
- (11) Criticality assessment of the waste package(s) which assumes full water moderation, and an infinite array and worse case loading if the waste package exceeds 177 g/m^3 volumetric average or a maximum of 350 g/waste package
- (12) Weight of the system(s) being shipped for disposal
- (13) Method of tiedown on carrier
- (14) Recommended method of handling at the RWMC
- (15) Limitations or special handling requirements of the waste package
- (16) Turnaround time or time until transport equipment must be released
- (17) Estimated number and frequency of shipments
- (18) Name, address, and telephone number of key waste generator personnel that will be associated with the waste shipments.

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U.S. DOE IDAHO NATIONAL ENGINEERING LABORATORY
 OFF-SITE RADIOACTIVE MATERIAL SHIPMENT RECORD
 (DIRECTIONS ON REVERSE SIDE)

References
 Manual Chapter 0529
 49 CFR 100-119

FORM IO-109A
 (Rev. 05-79)

Log No. _____

Originator	To _____	Charge No. _____	Classified <input type="checkbox"/>
	From _____	Collect <input type="checkbox"/> Prepaid <input type="checkbox"/>	
		Carrier(s) _____	Regular Comm. <input type="checkbox"/> Sole Use <input type="checkbox"/> Other <input type="checkbox"/>
		Type: Air <input type="checkbox"/> Truck <input type="checkbox"/> Rail <input type="checkbox"/> Water <input type="checkbox"/>	
	Physical Form: Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> Special <input type="checkbox"/> Normal <input type="checkbox"/>		
	Chemical Form: _____	FISSILE MATERIALS	
	Material(s) Shipped: _____	Not Applicable <input type="checkbox"/>	Pu _____
	Principal: _____	Class I <input type="checkbox"/>	U _____
	Transport Group _____	Class II <input type="checkbox"/>	Transp. Index _____
	Curies(Gi) _____	Class III <input type="checkbox"/>	Transp. Controls _____
	Quantity _____		
	Limited Quantity (or less) <input type="checkbox"/>		
	Man. Devices <input type="checkbox"/>		
	Type A <input type="checkbox"/>	Nuc. Safety Approval _____	
	Type B <input type="checkbox"/>	Date _____	
	Large <input type="checkbox"/>	ACCOUNTABLE NUCLEAR MATERIALS	
	LSA <input type="checkbox"/>	(Any Quantity)	
	Total Activity _____ Curies	Not Applicable <input type="checkbox"/>	
	Container Used (describe): _____	Shipment Contains Accountable Material <input type="checkbox"/>	
	Size _____ Weight _____	DCE Form 741 No. _____	
	Type: DOT Spec. _____ Type A <input type="checkbox"/> Type B <input type="checkbox"/>	Safeguards Rep. _____	
	Certificate of Compliance No. _____	Date _____	
LOADING CONTENTS INTO CONTAINER			
	Loading Inst. _____	Loaded: Dry <input type="checkbox"/> Wet <input type="checkbox"/>	Container: Drained <input type="checkbox"/> Cleaned <input type="checkbox"/>
	Container Insp. and Maint. Current <input type="checkbox"/>	Closures Secured <input type="checkbox"/>	Remarks _____
	Loader _____	Date _____	Organization _____
	Certification: Shipment Prepared in Accordance with Appendix 0529 <input type="checkbox"/>	Consignee is Authorized to Receive Shipment <input type="checkbox"/>	
	Remarks: _____		
	Originator _____	Date _____	Organization _____
Seal	No(s) _____	Affixed By _____	Organization _____ Date _____
Health and Safety	Tie-down Equipment Adequate <input type="checkbox"/>		LABELS
	Safety Inspector _____	Date _____	None Required <input type="checkbox"/> White I <input type="checkbox"/>
	Radiation (surface) _____ MREMIHR	(3 feet) _____ MREMIHR	Yellow II <input type="checkbox"/>
	Contamination (Averaged over any 100 cm ² Package Surface):		Yellow III <input type="checkbox"/>
Beta-Gamma _____	dis.m.in.100 cm ²	Transport Index _____	
Alpha _____	dis.m.in.100 cm ²	Empty <input type="checkbox"/>	
Remarks: _____			Others: _____
	Packagers: Surveyed By _____	Date _____	VEHICLE PLACARDS:
	Additional Surveys: Vehicle <input type="checkbox"/> Driver <input type="checkbox"/> Other _____	Date _____	None Required <input type="checkbox"/>
	Surveyed By _____	Date _____	Radioactive Material <input type="checkbox"/>
			Others: _____
Includes	CERTIFICATION AND AREA RELEASE		
	1. This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled, and in proper condition for transportation according to the applicable regulations of the Department of Transportation <input type="checkbox"/>		
	2. For shipments on passenger-carrying aircraft this shipment is within the limitation prescribed for passenger-carrying aircraft <input type="checkbox"/>		
	Area Supervisor _____	Area _____	Date _____
	Traffic Agent _____	Date Released _____	

Exhibit 1

POOR ORIGINAL

INSTRUCTIONS FOR COMPLETION OF ID-109A

GENERAL

1. All entries must be completed with either the appropriate information or the abbreviation of "not applicable" (N/A).
2. Where a selection is made from several choices in a group (e.g., Quantity), that selection negates the need to use N/A for the remainder.
3. Each section of the form (Originator, Health and Safety, Seal, etc.) must be completed in accordance with 1. above before succeeding activities are authorized to be completed.
4. The individual signing each section authenticates the accuracy and validity of all information contained therein.

SPECIFIC

Most of the selections are self-explanatory; however, the following brief explanations may be helpful:

1. Originator
 - a. Physical Form - "Solid" includes encapsulated material.
 - b. Fissile - (DOT Reg. 173.335)
 - (1) Transport Index - calculated by Fissile Class II as if in accordance with 173.335 (c)
 - (2) Fissile Class III - require listing controls and maximum number of these pkgs. permitted for the transport vehicle.
 - c. Accountable Nuclear Material - indicate the presence of any quantity of the following materials, regardless of the amount: Uranium, Plutonium, Californium, Neptunium, Thorium, Tritium, Berkelium, Americium, Lithium (enriched), Deuterium, and Curium.
 - d. Quantity
 - (1) Limited Quantity - defined in DOT Reg. 173.391.
 - (2) LSA - Low Specific Activity as defined in DOT Reg. 173.332
 - (3) Max. Devices - Manufactured articles containing radioactive material as defined in DOT Reg. 173.391(b)
 - e. Special Form - as defined in DOT Reg. 173.399 (a)
 - f. Normal Form - Radioactive materials that do not qualify as Special Form. This designation requires identification of the transport group (DOT Reg. 173.350) and its chemical form.
 - g. Reference to Appendix 6529 - requires certification that (1) pkg. undamaged, (2) neutron absorbers in place, (3) package closures adequate, etc.
 - h. Loading Contents into Container Section - must be completed and signed by the loader of the container contents prior to Originator sign-off. Container Inspection and Maintenance Current - this refers to the routine inspections for container required by Appendix 6529, Part IV.
 - i. Originator Sign-off - by this action Originator authenticates validity of information in this section.
2. Health and Safety
 - a. Safety Inspection - to be performed in accordance with ID Appendix 6529 Part VI requirements.
 - b. Transport Index - the greater numerical value of (1) the transport index calculated for Fissile Class II shipments, or (2) the radiation level measured at 3 ft. from the package surface.
3. Releases
 - a. Radioactive shipments transported by passenger-carrying aircraft - special precautions should be exercised to ensure adequate containment of the radioactive materials. (DOT Reg. 49 CFR Part 175)
 - b. Area Supervisor Sign-off - authenticates compliance of shipment with DOE and DOT Regs.

Exhibit 1 (Cont)

SECTION 2		APPROVED BY	
SECTION 3		APPROVED BY	DATE
SECTION 4		APPROVED BY	DATE
SECTION 5		APPROVED BY	DATE
SECTION 6		APPROVED BY	DATE
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SECTION 49		APPROVED BY	DATE
SECTION 50		APPROVED BY	DATE

SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	SECTION 7	SECTION 8	SECTION 9	SECTION 10	SECTION 11	SECTION 12	SECTION 13	SECTION 14	SECTION 15	SECTION 16	SECTION 17	SECTION 18	SECTION 19	SECTION 20	SECTION 21	SECTION 22	SECTION 23	SECTION 24	SECTION 25	SECTION 26	SECTION 27	SECTION 28	SECTION 29	SECTION 30	SECTION 31	SECTION 32	SECTION 33	SECTION 34	SECTION 35	SECTION 36	SECTION 37	SECTION 38	SECTION 39	SECTION 40	SECTION 41	SECTION 42	SECTION 43	SECTION 44	SECTION 45	SECTION 46	SECTION 47	SECTION 48	SECTION 49	SECTION 50
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SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	SECTION 7	SECTION 8	SECTION 9	SECTION 10	SECTION 11	SECTION 12	SECTION 13	SECTION 14	SECTION 15	SECTION 16	SECTION 17	SECTION 18	SECTION 19	SECTION 20	SECTION 21	SECTION 22	SECTION 23	SECTION 24	SECTION 25	SECTION 26	SECTION 27	SECTION 28	SECTION 29	SECTION 30	SECTION 31	SECTION 32	SECTION 33	SECTION 34	SECTION 35	SECTION 36	SECTION 37	SECTION 38	SECTION 39	SECTION 40	SECTION 41	SECTION 42	SECTION 43	SECTION 44	SECTION 45	SECTION 46	SECTION 47	SECTION 48	SECTION 49	SECTION 50
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POOR ORIGINAL

POOR ORIGINAL

UNITED STATES DEPARTMENT OF ENERGY
TRANSURANIC WASTE CONTAINER FORM

Prepared By _____ Phone _____
Date _____ Approved By _____
Date _____ Phone _____

SECTION 0

REPORT CONTROL CODES	CONTAINER IDENTIFICATION NUMBER	SCALE NUMBER	PACKAGE DATE	CONTAINER CONTENT	RADIATION DATA	CONTENT DESCRIPTION	SHIPMENT INFORMATION
1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

SECTION 1
WASTE CONTAINER DATA

CONTAINER CONTENT	RADIATION DATA		MAJOR NUCLIDE DATA		SECONDARY NUCLIDE DATA		SHIPMENT NUMBER	DATE
	AT SURFACE	AT 3 FEET	IDENT	AMOUNT FORBANS	IDENT	AMOUNT FORBANS		
1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Exhibit 3

INSTRUCTIONS

GENERAL INSTRUCTIONS: All organizations sending waste to the Transuranic Storage Area (TSA) at the Idaho National Engineering Laboratory (INEL) must utilize this form to report specific data on each individual waste container.

SPECIFIC INSTRUCTIONS:

- Only one entry per indicated space is allowed.
- Do not use more than the allotted spaces on the form.
- Data entered on the form must be legible and must be printed. The letter "O" shall be printed "0" to differentiate it from the number zero.
- The original and one copy of this form shall be submitted with the shipment papers.

SECTION 0

GENERAL INSTRUCTIONS: This section must always be completed. The alphabetical designation for the Contractor, Plant and Facility required in Columns 4, 5 and 6 shall be established by the Operations Offices. Each Office shall assure that there are no duplications of designations within its jurisdiction.

COLUMN:

- Alphabetical designation for the Operations Office. Use Office designations as shown below:

Albuquerque Operations Office	A	Oak Ridge Operations Office	O
San Francisco Operations Office	B	Pittsburgh Naval Reactors Office	P
Chicago Operations Office	C	Richland Operations Office	R
Headquarters - Germantown	U	Savannah River Operations Office	S
Idaho Operations Office	I	Space Nuclear Systems Office	U
Grand Junction Operations Office	J	Schenectady Naval Reactors Office	Y
Nevada Operations Office	L		
- Alphabetical designation for the Area Office. Use Office designations as shown below:

Amarillo	A	Hattiesburg	H	Palo Alto	O	Pacific Area	
Burlington	B	Idaho	I	Pinellas	P	Support	U
Cincinnati	C		J	Puerto Rico	Q	Cleveland	V
Dayton	D	Kansas City	K	Sacramento	R	Windsor	W
West Malton	E	Los Alamos	L	Shippingport	S	Sandia	X
Rocky Flats	F	Portsmouth	N	Pittsburgh	T	Peducan	Y
Concha Park	G	Nevada	N				
- The alphabetical designation of the Contractor, Laboratories, Universities and other Government organizations which ship wastes to the Idaho Transuranic Storage Area.
- The alphabetical designation of the main plant, such as Chemical Processing Plant, etc.
- The alphabetical designation of the facilities within the main plant, such as Calcination Facility, etc.

SECTION 1

GENERAL INSTRUCTIONS: This section must always be completed for every waste container shipped to the Idaho National Engineering Laboratory (INEL)

COLUMN:

- 7-12 Date waste container package was sealed. (MMDDYY, e.g., 042373)
- 13-21 Waste Container Identification Number. (Serial number, never to be repeated.)
- 22-27 Waste Container Seal Number.
- 28 Class of Waste: 1) Low Specific Activity (LSA), greater than 10 nanocuries but less than 100 nanocuries of transuranic nuclides per gram of waste; 2) Greater than LSA (NLSA); 3) Intermediate-Level Gamma Transuranic Storage Facility.
- 29 Category of Predominant Waste: 1) Compactible; 2) Non-compactible.
- 30 Type of Waste: 1) Combustible; 2) Non-combustible. (See ESDAM 0511 for definition.)
- 31 Type of Container: 1) Drum; 2) Box; 3) Special; 4) Bin.
- 32-35 Volume of Waste Container (right adjust numbers).
- 36 Units of Container Size: K=Gallons; F=Cubic Feet; M=Cubic Meters; L=Liters.
- 37-40 Container Gross Weight (right adjust numbers).
- 41 Units of Container Gross Weight: P=Pounds; G=Grams; T=Tons; K=Kilograms.
- 42-44 Waste Contents Code. The numerical designation which describes the type of waste. Each contractor shall establish his own code and provide a copy of it (and amendments) to DOE-ID.
- 45-48 Container Radiation Data. Report radiation value at surface in mr/hr except ILISF r/hr.
- 49-52 Container Radiation Data. Report radiation value at 3-feet in mr/hr except ILISF r/hr.
- 53-57 Nuclide Content. Major radionuclide; U233, PU238, etc. (left adjust).
- 58-61 Nuclide Content. Amount of major radionuclide in grams, to the nearest tenth.
- 62-66 Nuclide Content. Secondary radionuclide; U233, PU238, etc. (left adjust).
- 67-70 Nuclide Content. Amount of secondary radionuclide in grams.
- 71-76 Shipment Number (Bill of lading number or special designation).
- 77-80 Shipment Date, month and year. (MMYY, e.g., 0673)

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Exhibit 3 (cont)

