2
SEP 30 1994

35 Station 21

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT

601100

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) WRAP Mechanical Engineering W7FD60	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: W-026, WRAP-1	6. Cog. Engr.: D. T. Ruff	7. Purchase Order No.: N/A
8. Originator Remarks: APPROVAL/RELEASE		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: WRAP 1 Facility
11. Receiver Remarks:		12. Major Assm. Dwg. No.: H-2-132048 Rev 1
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: N/A

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)			
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Trans- mittal	Origi- nator Dispo- sition	Receiv- er Dispo- sition			
1	WHC-SD-W026-OCD-001		0	One-Trip Drum Operating Instruction	N/A	1					
16. KEY											
Impact Level (F)		Reason for Transmittal (G)			Disposition (H) & (I)						
1, 2, 3, or 4 (see MRP 5.43)		1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)			1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged						
(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)						(G)	(H)		
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog.Eng. DT Ruff	<i>DT Ruff</i>	9/9/94	G3-15	Central Files (Original)			L8-04	3	
1	1	Cog. Mgr. DE Ball	<i>DE Ball</i>	9/28/94	G6-46	WRAP/DMC(3)			G3-15	3	
1	1	QA JR McGee	<i>Jack McGee</i>	9/9/94	G3-15	JH OBrien			G2-02	3	
		Safety									
		Env.									
1	1	BA Mayancsik	<i>BA Mayancsik</i>	9-13-94	G4-92						
18. DT Ruff <i>DT Ruff</i> 9/9/94 Signature of EDT Originator Date											
19. _____ Authorized Representative Date for Receiving Organization											
20. <i>DE Ball</i> 9/28/94 Cognizant/Project Engineer's Manager Date											
21. DOE APPROVAL (if required) Ltr. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments											

BD-7400-172-2 (07/91) GEF097

BD-7400-172-1 (07/91)

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RELEASE AUTHORIZATION

Document Number: WHC-SD-W026-OCD-001, Revision 0

Document Title: One-Trip Drum Operating Instruction

Release Date: 9/29/94

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This document was reviewed following the
procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

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WHC Information Release Administration Specialist:

C. Willingham

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9/29/94

(Date)

SUPPORTING DOCUMENT

1. Total Pages 8

2. Title

One-Trip Drum Operating Instruction

3. Number

WHC-SD-W026-OCD-001

4. Rev No.

0

5. Key Words

WRAP, Drums, Heads, Lids, Bagless Transfer, Drop Test.

6. Author

Name: D. T. Ruff

Signature

Organization/Charge Code W7FD60/A451A

7. Abstract

The one trip system is a bagless transfer system for egress of waste from gloveboxes into 55 gallon one-trip drums. The contents of this document give an overview of the assembly, loading, and handling of the one-trip drum for use in the WRAP-1 plant.

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9. Impact Level N/A

10. RELEASE STAMP

OFFICIAL RELEASE
BY WHC
DATE SEP 30 1994

35 Station 21

APPROVED FOR
PUBLIC RELEASE
CW
9-29-94

Project W-026
Waste Receiving and Processing Facility Module 1
(WRAP 1)

One-Trip Drum Operating Instruction
Operating Criteria Document

WHC-SD-W026-OCD-001
Revision 0

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TABLE OF CONTENTS

	<u>Page</u>
1.0 SCOPE.	1
2.0 GENERAL DESCRIPTION	1
3.0 REFERENCE DOCUMENTS	1
4.0 PACKAGE CONSTRUCTION	2
4.1 Components	2
4.2 Assembly	2
5.0 PACKAGE LOADING AND CLOSURE	3
6.0 PACKAGE HANDLING	5

ONE-TRIP DRUM OPERATING INSTRUCTION

1.0 SCOPE

The purpose of this operating instruction is to convey the necessary information for proper handling of the one-trip drum for WRAP-1.

2.0 GENERAL DESCRIPTION

The one-trip drum is a modified UN-1A2 galvanized 55 gallon drum. The modifications to the drum consist of the addition of: an inner lid, inner seal, inner ring (adhered to the inside of the drum), and inner gasket. The modifications to the drum provide it with the capability of mating to the British Nuclear Fuels Limited (BNFL) One-Trip bagless transfer system as modified by WHC testing (Reference 1 of Section 3.0). The bagless transfer system allows the loading of the one-trip drum with waste from a glovebox process line without contaminating the exterior of the waste package and while maintaining glovebox confinement.

The gross weight of the one-trip drum is not to exceed 1,000 pounds. If necessary, the contents of the waste package will be packed with sufficient dunnage as to prevent damage to the one-trip drum during transport. It has been designed for the following payloads:

- Material Form No. 1: Solids - Any particle size
- Material Form No. 2: Solids - Large particle size only (i.e., sand, concrete, debris, soil, etc.)
- Material Form No. 3: Solids - Objects with no significant dispersible or removable contamination (see 49 CFR 173.443)

3.0 REFERENCE DOCUMENTS

The following documents contain information that will be referred to instead of repeated in this operating instruction:

1. Test Report, WHC-SD-W026-TRP-014 Rev 1, "One-Trip Bagless Transfer System Test Report."
2. Document, WHC-SD-W026-SDRD-001 Rev 3, "Supplemental Design Requirements Document, Revision 3, Project W026."
3. Drawing, Hanford Drawing H-2-824300, 55 Gallon One-Trip Drum Arrangement and Details.
4. Specification, HS-V-P-0010 Rev C, Hanford Drum Purchasing Spec.

4.0 PACKAGE CONSTRUCTION

The one-trip drum consists of the following listed components assembled in the following manner (see One-Trip Drum Drawing).

4.1 Components

- A. DOT UN-1A2 galvanized 55 gallon drum built to Hanford Standard HS-V-P-0010 Rev C.
 - 1. Drum Body
 - 2. Drum Head
 - 3. NucFil-013 HEPA filter on head
 - 4. Clamp band and bolt
- B. Inner ring, low carbon steel, adhered to the inside of the 55 gallon drum with E-6000¹ adhesive.
- C. Inner seal, Neoprene/sbr foam, adhesive backed and adhered to top of inner ring.
- D. Inner lid, low carbon steel, fitted with NucFil²-013 filter and locking nut, compresses inner seal when swaged into place against the inner ring.
- E. Inner gasket, Buna-N rubber sheet, sandwiches inner lid against inner seal upon final closure of the drum.

4.2 Assembly

4.2.1 Inner Ring Installation

The inner ring is mechanically held inside of the drum body below the height of final adhesion. E-6000 adhesive is then liberally applied around the circumference of the drum body above the inner ring and at the proper height for final placement of the inner ring. The inner ring is then drawn up into place ($\approx 7/8$ " from the top of the drum false wire) over the applied adhesive. Once oriented to the proper height around its circumference, the inner ring is mechanically clamped into place to allow the adhesive to cure. This first application of adhesive is allowed to cure for 24 hours and provides sufficient adherent strength, but another application is necessary to provide an air tight seal between the inner ring and drum body. The second application occurs above and below the inner ring and is pressed into place. Any excess adhesive must be removed from the top surface of the inner ring for proper installation of the inner seal. The second application of adhesive is allowed to cure for 24 hours.

¹E-6000 is a trademark of Eclectic Products Incorporated, Carson, California.

²NucFil is a trademark of Nuclear Filter Technology Corporation, Lakewood, Colorado.

4.2.2 Inner Seal Installation

The adhesive back of the inner seal is removed while the inner seal is pressed into place on the top surface of the inner ring. The seal fits tightly against the inner surface of the drum body.

4.2.3 Inner Lid Installation

The inner lid must be fitted with a Nucfil-013 HEPA filter. A one inch diameter hole is punched into the center of the inner lid. A NucFil-013 filter is threaded through the hole and a locking nut is tightened onto the back side of the HEPA filter and torqued to 25 (± 1) ft-lbs. This torque on the filter provides a tight seal by compressing the filter gasket between the filter and the lid. The inner lid is then placed into the drum and rests on the inner seal. The inner lid will be permanently mated to the inner ring by the BNFL One-Trip system.

4.2.4 Inner Gasket

The inner gasket is laid into place on top of the inner lid. The gasket should lay flat against the inner lid and inner seal. The outer lid is placed over the top of the inner gasket compressing the gasket against the inner lid.

4.2.5 Outer Lid Filter

A NucFil-013 filter is installed into the provided flange on the outer drum lid. The flange is located in the center annulus of the outer lid at least three inches from the center to avoid interference with the filter in the inner lid. The filter is torqued to 25 (± 1) ft-lbs to provide a proper seal between the filter and the outer lid. No sealant or tape is added to enhance this seal.

5.0 PACKAGE LOADING AND CLOSURE

The one-trip drum is designed to operate with the British Nuclear Fuels Limited (BNFL) One-Trip bagless transfer system as modified by WHC test report WHC-SD-W026-TRP-014 Rev 1. The bagless transfer system provides the mechanism for opening and closing the one-trip drum while it is mated to the transuranic gloveboxes of the WRAP-1 plant. Inside of these gloveboxes, retrieved and newly generated solid transuranic waste has undergone limited treatment to meet the current waste acceptance criteria at the designated permanent disposal site(s). The one-trip drum will be loaded with the waste that meets these criteria and upon exit from the WRAP-1 glovebox line will be permanently closed for transport to final disposal.

The waste stream entering WRAP-1 will have the following cross section:

• Metal	22 vol%
• Lead	Trace
• Dirt	4 vol%
• Filters	1 vol%
• Wood	1 vol%
• Concrete	2 vol%

- Glass 2 vol%
- Absorbent 1 vol%
- Rubber 8 vol%
- Plastic 27 vol%
- Paper 20 vol%
- Cloth 6 vol%

The waste stream exiting WRAP-1 (loaded into one-trip drums) will have the same cross section, minus hazardous constituents, mixed waste, and liquids. The limited treatment of the waste in WRAP-1 includes the following (see WRAP-1 SDRD Section 2.4):

- Removal of containerized liquids
- Removal of particulate waste
- Removal of suspect mixed waste
- Removal of HEPA filters
- Removal of closed containers larger than one gallon in size
- Removal of aerosol cans
- Sample all of the above items for characterization
- Treat all of the above items to meet acceptance criteria
 - Depressurize and drain aerosol cans
 - Neutralize corrosive materials
 - Absorb and solidify liquids
 - Immobilize particulates

The glovebox operating procedures will require the operators to repackage the waste in such a manner that protects the one-trip drum from damage by large hard objects. In most instances it is predicted that enough soft waste will be available to provide the necessary dunnage for packing these objects. In the case that soft waste was not available, dunnage will be added.

The waste will be dumped from a sorting table within the glovebox onto a chute that directs the waste into the center of the one-trip drum while protecting the inner ring assembly. Heavy objects will be lowered into the one-trip drums by a hoist to preclude damage of the drum during loading.

Once the treated waste has been loaded into the one-trip drum from the glovebox, the BNFL One-Trip bagless transfer system is closed. The One-Trip system port door closes the drum by pressing the inner lid against the inner seal. The inner seal is compressed sufficiently to position bottom of the inner lid below the flange of the inner ring (approx. 1/8" seal compression). The swaging heads of the port door are then actuated with 5,000 psi of hydraulic pressure to swage the inner lid into the inner ring in four locations. The consistency of the swage depths is controlled by tight tolerances on the swaging head locations and the inner lid and inner ring dimensions (see WHC-SD-W026-TRP-014 Rev 1 Page C-3 and Appendix D) in conjunction with limit switches on each swaging head that verify that end of stroke was attained. The swages are approximately 1/8" by 3/8" by 3/16" deep. This operation permanently compresses the inner seal and confines the waste inside of the one-trip drum.

The drum is then separated from the glovebox. The inner gasket is then laid into place over the inner lid. The gasket should lay flat with a minimum gap between the edge of the gasket and the inside of the drum wall. The outer lid (standard UN-1A2 drum lid) and clamp band are placed on the drum. The clamp band is placed over the outer lid and the drum false wire. The clamp bolt is then threaded through the clamp band. The clamp band is lightly impacted around its circumference while the clamp bolt is tightened. This process is repeated until the clamp band will no longer move when impacted and tightened. Then a torque wrench is used to tighten the clamp bolt to a torque of 40 (± 1) ft-lbs. The jam nut on the clamp bolt is then tightened against the threaded portion of the clamp band to 40 (± 1) ft-lbs. If different from the above process, the particular drum manufacturer's recommended closing procedure should supersede. The waste drum will be surveyed for contamination and decontaminated if necessary. A wire and tag will be wrapped through the clamp bolt for tamper indication.

6.0 PACKAGE HANDLING

The WRAP-1 plant is an automated waste processing plant for characterization, limited treatment, and transport to final disposal for LLW and TRU solid waste. Handling of waste packages inside of the plant will be exclusively mechanical.

After the one-trip drum is removed from the glovebox and before shipment out of the WRAP-1 plant, it is weighed. If its weight exceeds the 1,000 pound limit for the package it will not be shipped. The package weight will have to be reduced by further processing.

The one-trip drum, once loaded, is carried by automatic guided vehicles (AGV) to the TRUPAC II loading station. There the drum is mechanically loaded into a seven-pack configuration and shrink wrapped. Two seven-packs of one-trip drums are then mechanically stacked and loaded into the TRUPAC II container. The TRUPAC II container is closed and transported to the disposal site.