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Title/Desc:

FFTF RAILROAD TANK CAR SAFETY EVALUATION FOR
PACKAGING

10/2/95
Sta. 37

35

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT No 611657

2. To: (Receiving Organization) Packaging Engineering	3. From: (Originating Organization) Packaging Engineering	4. Related EDT No.: NA
5. Proj./Prog./Dept./Div.: 84400	6. Cog. Engr.: R. F. Carlstrom	7. Purchase Order No.: NA
8. Originator Remarks: The FFTF 8,000 Gallon Liquid Waste Tank Car will be used to transfer bulk LSA liquids on the Hanford Site. A Safety Evaluation for Packaging (SEP) provides the approval for this onsite transfer. The SEP is circulated for approval.		9. Equip./Component No.: NA
		10. System/Bldg./Facility: NA
11. Receiver Remarks:		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
		14. Required Response Date:

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	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-TP-SEP-040	N/A	0	FFTF Railroad Tank Car Safety Evaluation for Packaging	SQ	1	1	

16. KEY											
Approval Designator (F)		Reason for Transmittal (G)				Disposition (H) & (I)					
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		1. Approval	4. Review			1. Approved	4. Reviewed no/comment				
		2. Release	5. Post-Review			2. Approved w/comment	5. Reviewed w/comment				
		3. Information	6. Dist. (Receipt Acknow. Required)			3. Disapproved w/comment	6. Receipt acknowledged				
(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Approval Designator 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.: RF Carlstrom		9/14/95	G2-02	PC Miller		9/14/95	N2-57	1	1
1	1	Cog. Mgr.: JG Field		9/12/95	G2-02						
1	1	QA: CR Hoover		9/12/95	H4-16						
1	1	Safety: DW McNally		9/12/95							
		Env.									
1	1	RJ Smith		9/13/95	G2-02						
1	1	WR Church		9/14/95	N2-56						
18. R. F. Carlstrom Signature of EDT Originator Date 9-3-95		19. Authorized Representative for Receiving Organization Date		20. J. G. Field Cognizant Manager Date		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments					

RELEASE AUTHORIZATION

Document Number: WHC-SD-TP-SEP-040, Rev. 0

Document Title: Fast Flux Test Facility, Liquid Waste Tank Car, Low Specific Activity, Equivalent Safety

Release Date: 9/21/95

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

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

V. L. Birkland

V. L. Birkland

9/21/95

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SUPPORTING DOCUMENT

1. Total Pages 8

2. Title FFTF Railroad Tank Car Safety Evaluation for Packaging	3. Number WHC-SD-TP-SEP-040	4. Rev No. 0
5. Key Words Fast Flux Test Facility, Liquid Waste Tank Car, Low Specific Activity, Equivalent Safety	6. Author Name: R. F. Carlstrom Signature Organization/Charge Code 84400/B181D	
7. Abstract This Safety Evaluation for Packaging (SEP) provides evaluations considered necessary to approve transfer of the 8,000 gallon Liquid Waste Tank Car (LWTC) from Fast Flux Test Facility (FFTF) to the 200 Areas. This SEP will demonstrate that the transfer of the LWTC will provide an equivalent degree of safety as would be provided by packages meeting U.S. Department of Transportation (DOT) requirements. This fulfills onsite transportation requirements implemented in the <i>Hazardous Material Packaging and Shipping</i> , WHC-CM-2-14.		
8. RELEASE STAMP

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LIST OF TERMS

ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulation
DOT	Department of Transportation
ECN	Engineering Change Notice
FFTF	Fast Flux Test Facility
FRA	Federal Railroad Administrator
ICC	Interstate Commerce Commission
LSA	Low specific activity
LWTC	Liquid Waste Tank Car
RSR	Radioactive Shipment Record
SEP	Safety Evaluation for Packaging

FFTF RAILROAD TANK CAR SAFETY EVALUATION FOR PACKAGING

1.0 GENERAL INFORMATION

This Safety Evaluation for Packaging (SEP) provides authorization for the use of the 8,000 gallon Liquid Waste Tank Car (LWTC) for interarea shipment of low-level radioactively contaminated liquid waste from the Fast Flux Test Facility (FFTF) in the 400 Area to the 200 Areas for waste disposal. Preparation of a SEP is necessary to document the equivalent safety of the onsite shipment in lieu of meeting the U.S. Department of Transportation (DOT) requirements. This SEP authorizes movement of the empty LWTC under the requirements of 49 CFR 173.425(c) for transport of bulk liquids and deletes the internal inspection requirement for the LWTC listed in 49 CFR 173.31(c)(3).

The SEP will approve transfer of the LWTC within 5 years from date of issue unless otherwise designated by issue of an Engineering Change Notice (ECN).

2.0 PACKAGING DESCRIPTION

A reusable 8,000 gallon LWTC under the custody of FFTF, serial number 10H-03712, is used for the interarea transport of radioactive contaminated liquid waste. Waste shipments are made from the 400 Area and may be sent to approved load-out facilities in either 200 East or 200 West Areas. Transfer of the LWTC to these areas is also done for inspection and maintenance.

The LWTC was fabricated in 1953 in accordance with the Interstate Commerce Commission (ICC) specification 103-CW, which was later grandfathered by the DOT. Details of the LWTC fabrication are listed in drawing H-4-63895 (WHC 1980).

The tank car is constructed of American Society for Testing and Materials (ASTM) A240 Type 430 steel and has an 8,000 gallon capacity. Hood and shelf couplers designated by the American Railroads catalog approved by the Federal Railroad Administrator (FRA), which are equipped with automatic couplers that will resist car telescoping and jackknifing in derailments and in emergency stops, were installed on the LWTC which bring the LWTC in compliance with 49 CFR 179.14. A lidded sealed cupola provides a containment barrier for fittings valves, and flanges during transport and storage.

3.0 CONTENTS

The materials to be transported in the 8,000 gallon LWTC are FFTF waste solutions. These materials shall meet the definition of low specific activity (LSA) as defined in 49 CFR 173.403(n) and 173.425(c).

The total amount of fissile material is limited to 15 g.

4.0 OPERATING REQUIREMENTS

4.1 GENERAL

1. All applicable instructions and procedures for onsite shipments of radioactive materials specified in WHC-CM-2-14, *Hazardous Material Packaging and Shipping*, shall be followed.
2. The 8,000 gallon LWTC or the design shall not be altered or revised without documented approval obtained by Packaging Engineering.
3. Unless otherwise noted in Section 4.2.2, it shall be verified that the 8,000 LWTC complies with the 103-CW specification (49 CFR 179.200-1).
4. Unless otherwise noted in Section 4.2.2, the inspections of the 8,000 gallon LWTC shall be done according of 49 CFR 173.31, "Qualification, maintenance, and use of tank cars" prior to LWTC usage.
5. For bulk unpackaged LSA radioactive liquids, transport shall be exclusive use and shall comply with the requirements of 49 CFR 173.425(c).

4.2 INSPECTION

1. The loaded LWTC stored outdoors shall be visually inspected for leaks and abnormal conditions at least once a day.
2. Prior to departure (unloaded or full), the LWTC shall be inspected for potentially hazardous conditions as follows:
 - Car body leaning or listing, sagging, objects dragging below or extending the side, any broken or missing safety appliances.

- Leaking of contents from the LWTC.
 - Any other condition considered likely to cause an accident before the train arrives at its destination.
 - The shipper must determine to extent practicable, that the tank, safety appurtenances, and fittings are in proper condition for the safe transportation.
 - Tanks or trains which show any of the defects mentioned must not be offered for transportation until proper repairs have been made by the appropriate personnel.
3. Prior to loading of the LWTC, verify that the brakes and running gear preventive maintenance inspection is current.
 4. Retest and inspection of the LWTC must be conducted prior to usage and include the following:
 - Completely filling the tank car with water or other liquid of similar viscosity and pressure test to 60 psi (49 CFR 173.31, Table 1).
 - The pressure relief valve tested to discharge at 35 ± 3 psi and vapor tight seal at 28 psi (49 CFR 171.31, Table 1).

NOTE: Internal inspections as stated in 49 CFR 173.31(c)(3) shall not be required.

5. Records of inspection and preventive maintenance of the LWTC shall be retained for the life of the container to furnish evidence of activities affecting quality.

4.3 LOADING/UNLOADING

1. Tank car loading and unloading shall be scheduled to minimize outdoor storage of the loaded tank car.
2. The tank car shall be filled under strict liquid level control (weight factor instrument and load out tank material balance) to avoid water hammer damage to the rupture disc, and to avoid pressurizing the tank with loading pump pressure.
3. The shipper shall verify by analyses or testing that the LSA radioactive limits are met [49 CFR 173.425(c)] prior to all shipments.

NOTE: For movement of the empty LWTC, the limits of 49 CFR 173.425(c) shall be used. The limits of 49 CFR 173.421(b) for empty containers do not apply.

4.4 TRANSPORTATION

1. The shipper shall provide an accurate description of the radiological conditions of the shipment to the receiving facility by:
 - Telephone conversation prior to shipment, and on the Radioactive Shipment Record (RSR) delivered by the train crew.
2. Train speed shall not exceed 3 mph while coupling.
3. The LWTC shipment shall not move at a speed in excess of 25 mph while full, unloaded, or on any route. Speed shall not exceed 10 mph on any paved road crossing or under the following conditions:
 - Inside limited areas,
 - During icy or snowy conditions, or
 - When visibility is hampered due to fog, smoke, or haze.Speed shall not exceed 5 mph (exiting or entering) while on a rail spur of any facility.
4. Trains or other railroad equipment shall be safely separated by dispatcher control of train and equipment movement. Hanford railroad dispatcher control and train order practices shall apply.
5. To minimize the possibility of a train and vehicle collision, all tank car shipments that cross paved roads outside limited areas shall have a patrol blockade of the road on each side of the rail crossing to stop vehicle traffic. When the train approaches the crossing, the engineer shall signal traffic by blowing the train horn and shall slow the train to 10 mph.
6. The train shall consist of the locomotive, and at least one spacer car on each end of the LWTC.
7. At least one person in the cab of the locomotive must keep the cars under observation at all times while the train is moving.

8. The train shall consist of the locomotive with one to four spacer cars between it and a single tank car. One or more spacer cars shall follow the tank car. The total number of cars behind the locomotive shall not exceed the three to seven mentioned here. The number of spacer cars used shall be dependent on the dose rate received by personnel in the cab of the locomotive and received by other essential personnel during transfer.
9. The tank car shall be towed rather than pushed whenever possible.
10. The tank car shall not be left unattended enroute.
11. The tank car shall not travel past the interchange tracks of the 1100 Area.
12. Tank Farms Surveillance Operations, Operational Health Physics, Radiation Protection, and Packaging Engineering shall be notified of all accidents involving radioactive material shipment that result in vehicle damage, container damage, and/or personnel injury, or contamination.
13. Access to tank contents (full or unloaded tank car) must be sealed with a security seal, which is not readily breakable, and while intact, would be evidence that the package has not been opened by unauthorized persons.

5.0 REFERENCES

- 49 CFR 173, 1994, "Packaging and Transportation of Radioactive Materials," *Code of Federal Regulations*, as amended.
- 49 CFR 179, 1994, "Specifications for Tank Cars," *Code of Federal Regulations*, as amended.
- WHC-CM-2-14, *Hazardous Material Packaging and Shipping*, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1980, *8000 Gallon Tank Car Cupola Modifications and Transition Attachments*, drawing H-4-63895, Westinghouse Hanford Company, Richland, Washington.