RETURN TO D. CRAMER 396 SS

71-5595 PDR

Department of Energy
Oak Ridge Operations
P.O. Box E
Oak Ridge, Tennessee 37830

July 8, 1981

U.S. Nuclear Regulatory Commission
ATTN: Mr. Charles E. MacDonald, Chief
Transportation Certification Branch
Division of Fuel Cycle & Material Safety
Washington, D.C. 20553

Gentlemen:

SAFETY ANALYSIS REPORT FOR PACKAGING: THE ORNL URANIUM-SHIELDED SHIPPING CASK, REPORT ORNL/ENG/TM-4

Reference is given to the subject SARP and to your Docket No. 71-5595.

In reply to the specific additional information which you requested, ORNL prepared the enclosed supplemental data. DOE-ORO has reviewed this data and concurs with the conclusions.

We request only a secondary priority review at this time.

Sincerely,

William H Travis

William H. Travis, Director
Safety & Environmental Control Division

SE-332:WAP
FSS: 1224

Enclosure:
ORNL Answers (10)

cc w/encl:

C. H. Durham, AD-46
D. M. Ross, EV-133, G-135, GTN

cc w/o encl:

V. J. D'Amico, SE-30

Uranium Shielded Shipping Container

Structural

1. Section 1.3.2 in the SARP, contains all the justifications for the shear strength of uranium that we have identified.

2. Analytical verification of lid retention is not practical. ORNL has drop tested several shipping containers under accident conditions. ORNL/TM-1312, Vol. 17, describes the testing of the HWCTR cask, and a report is being prepared on an oblique drop of the knapp mill spent fuel container. The drops have not produced any lid separation on any cask. We have found that a major portion of the cask energy is translated to rotation upon initial impact, and is spent upon deformation on the end of the cask opposite the closure and the deformation of the closure end tends to jar the lid in place. The oblique drop of the knapps mill container jammed the lid such that two 25-ton hydraulic jacks were required to remove the lid. It is noted that the lid of the uranium cask does not form primary containment. The special forms container provides primary containment. These have been evaluated and meet accident condition requirements.

Containment

1. The analysis in the report demonstrates that the inner containers have no detectable leaks under either the normal or accident conditions. Therefore a containment acceptance criteria is not needed.

2. The design of the inner containers used for normal forms are fully described in Section 1.9. The analysis demonstreats that no detectable leaks are present under normal or accident conditions. No containment criteria is needed.

Test and Maintenance

1 & 2 - Each container is leak tested prior to shipment. Attached is the procedure.

OPERATIONS DIVISION
RADIOISOTOPE DEPARTMENT

BUILDING 3029
SOURCE DEVELOPMENT LABORATORY

LEAK TESTING PROCEDURE FOR RADIOACTIVE MATERIALS CONTAINED IN SPECIAL FORM OR DOT 2R CAPSULES

I. Leak Testing

A. General

All radioactive materials contained in Special Form or DOT 2R capsules are leak tested before shipment. The method used is the air bubble, vacuum, and glycol as described in ANSI Standard N14.5 A3.6.

B. Equipment

1. The leak test equipment consists of a glass test chamber with a removable sealable top. A line penetrates the top and is connected to an in-cell vacuum pump. The size and shape of the test chamber may vary with the design of the piece being tested; and must be large enough that the piece can be completely immersed in the test liquid, leaving at least one inch of test liquid above the weld area.

2. Racks, suspension assemblies, or similar positioning devices may be required for some radioactive sources. These will be designed so as not to interfere with observation of the weld area during testing.

3. Unless otherwise specified, the test liquid for liners is distilled water. The final test liquid for radioactive sources is ethylene glycol. The final leak test has a sensitivity greater than 1×10^{-6} at.cm^3/sec.

C. Procedure

1. The test chamber is filled with test liquid to a depth sufficient to cover the piece being tested and leave at least one inch, but not more than three inches, of test liquid above the weld area when the piece is in the test position.

2. The top is placed on the test chamber and a vacuum of at least 20 inches Hg is imposed.

3. The piece, and especially the weld area, is observed for 30 seconds while the vacuum is maintained. A leak is indicated by a steady stream of air bubbles coming from a fixed point on the source.

4. After the 30-second observation the vacuum is relieved; then the piece is removed from the test chamber.

OPERATIONS DIVISION
RADIOISOTOPE DEPARTMENT
BUILDING 3029
SOURCE DEVELOPMENT LABORATORY

LEAK TESTING PROCEDURE FOR RADIOACTIVE MATERIALS CONTAINED IN SPECIAL FORM OR DOT 2R CAPSULES

a. Leaking pieces are rejected and defueled.

b. Non-leaking pieces are transferred to the furnace testing area.

APPROVED

SUPERVISOR	PROCESS GROUP LEADER	DATE
[signature]	R. W. Bohnich	2/12/80

PROC. NO. 31
PAGE 3 OF 3
DATE 2/12/80

OPERATIONS DIVISION
RADIOISOTOPE DEPARTMENT

BUILDING 3029

SOURCE DEVELOPMENT LABORATORY

LEAK TESTING PROCEDURE FOR RADIOACTIVE MATERIALS
CONTAINED IN SPECIAL FORM OR DOT 2R CAPSULES

RADIOACTIVE SOURCE DATA SHEET

Customer _____ Capsule No. _____

S.W. No. _____ Fuel Form _____ Curies _____

Fuel Batch No. _____ Assay _____

Nom. Dim.-O.D. _____ I.D. _____ Length _____ Cap. Thk. _____

Capsule Comp. _____ Spec. Sheet _____

	Accepted	Reject		Date	Supvr.
Capsule & Cap Degreased					
Liner No. _____					
Liner Cleaned					
Liner Dried ( )					
Welding Procedure					
Test Weld No. _____					
Capsule Welded _____					
Go-no-go Test					
Leak Test					
Oven Test ( )					
Go-no-go Test					
Leak Test					
Decontaminated	Max. Smear	Avg.	_____		
Shelf Test Started					
Shelf Test Completed					
Re-smear	Max. Smear	Avg.	_____		
Go-no-go Test					
Source Disposition					

APPROVED:

SUPERVISOR	PROCESS GROUP LEADER	DATE
[illegible]	C. D. Schaack	2/12/80