

JUL 09 1998
Sta. 37 (20)

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 622374

2. To: (Receiving Organization) BWHC - 324 Projects		3. From: (Originating Organization) Packaging Engineering (03E00)		4. Related EDT No.: NA	
5. Proj./Prog./Dept./Div.: BWHC - 324 Projects (K4C25) (WMNW: 772030/40-054-001)		6. Design Authority/ Design Agent/Cog. Engr.: SD Landsman, Cog. Engr., BWHC		7. Purchase Order No.: NA	
8. Originator Remarks:				9. Equip./Component No.: NA	
				10. System/Bldg./Facility: NA	
11. Receiver Remarks:		11A. Design Baseline Document? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		12. Major Assm. Dwg. No.: NA	
ENGINEERING DATA TRANSMITTAL					
13. Permit/Permit Application No.: NA					
14. Required Response Date: <u>7/9/98</u>					

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	HNF-2945		0	Cesium Powder and Pellets Inner Container Decontamination Method Determination Test	Q	1,2		

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 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

17. SIGNATURE/DISTRIBUTION
(See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority	N/A		
		Design Agent	N/A		
1	1	Cog. Eng.: PC Ferrell	<i>PC Ferrell</i>	7/9/98	H1-15
1	1	Cog. Mgr.: JG Field	<i>JG Field</i>	7/9/98	H1-15
1	1	QA: CR Hoover	<i>CR Hoover</i>	7/9/98	H1-15
		Safety	N/A		
		Env.	N/A		

18. <i>PC Ferrell</i> P.C. Ferrell <i>PC Ferrell</i> Signature of EDT Originator		19. <i>J.B. Field</i> E.J. Bitten Authorized Representative Date for Receiving Organization		20. <i>J.S. Field</i> J.S. Field Design Authority/ Cognizant Manager		21. DOE APPROVAL (if required) Ctrl. No. NA <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments	
----------------------------------------------------------------------------------------------	--	------------------------------------------------------------------------------------------------------	--	-------------------------------------------------------------------------------	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Cesium Powder and Pellets Inner Container Decontamination Method Determination

P. C. Ferrell

Waste Management Federal Services Inc., Northwest Operations,
Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-96RL13200

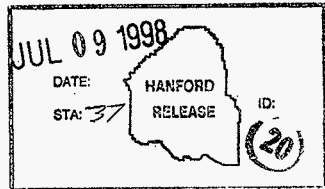
EDT/ECN: EDT 622374 UC: 513
Org Code: 03E00 Charge Code: K4C25 (772030/40-054-001)
B&R Code: EW7050000 Total Pages: 30

Key Words: Cesium Powder and Pellets, Inner Container, Decontamination.

Abstract: The Cesium Powder and Pellets Inner Container is to be performance tested per the criteria specified in Section 4.0 of HNF-2399, "Design, Fabrication, and Assembly Criteria for Cesium Powder and Pellet Inner Container." The test criteria specifies that the Inner Container be water tight during decontamination of the exterior surface. Three prototypes will be immersed into a pool of water to simulate a water decontamination process.

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.



Janis Cardal 7/9/98
Release Approval /Date

Release Stamp

Approved for Public Release

CONTENTS

1.0 PURPOSE AND SCOPE 1

2.0 REFERENCES 1

3.0 GENERAL REQUIREMENTS 1

 3.1 RECORDS 1

 3.2 MEASURE OF SUCCESS 2

 3.3 SAFETY 2

 3.4 PRETEST MEETINGS 2

 3.5 PHOTOGRAPHY 2

 3.6 EXPECTED DATA 2

 3.7 MATERIAL TRANSFER FORM 2

4.0 PREREQUISITES 2

 4.1 SAFETY 2

 4.2 PERSONNEL REQUIREMENTS 3

 4.3 WITNESSES 3

5.0 TEST EQUIPMENT 3

6.0 DETAILED TEST PROCEDURE 3

 6.1 PRETEST REQUIREMENTS 4

 6.2 PREPARATION OF TEST SPECIMENS 5

 6.3 HEAT/WATER IMMERSION TEST 5

APPENDIX A MATERIAL TRANSFER FORM A-1

APPENDIX B OPTIONAL TESTS B-1

APPENDIX C ADDITIONAL WATER IMMERSION TESTING
DUE TO TORQUE VALUE CHANGE C-1

LIST OF TERMS

BWHC	B&W Hanford Company
QA	Quality Assurance
QC	Quality Control
WMNW	Waste Management Federal Services, Inc., Northwest Operations

This page intentionally left blank.

CESIUM POWDER AND PELLETS INNER CONTAINER DECONTAMINATION METHOD DETERMINATION TEST

1.0 PURPOSE AND SCOPE

The Cesium Powder and Pellets Inner Container is to be performance tested per the criteria specified in Section 4.0 of HNF-2399, *Design, Fabrication, and Assembly Criteria for Cesium Powder and Pellet Inner Container* and Task Order SW826. The test criteria specifies that the Inner Container be water tight during decontamination of the exterior surface.

The decontamination method determination test will consist of heating, cooling, then immersing three prototype Inner Containers in a pool of water to simulate a water decontamination process. Due to the concern of condensate, the pool of water will contain a leak detection agent (fluorescein). Any in-leakage detection of the fluorescent water to the Inner Container will constitute container seal failure. Additional optional tests are identified in Appendices B and C of this test procedure. The tests will be conducted by the Numatec Hanford Company in the 305 Building.

This procedure may be modified at any time by the mutual decision of the Waste Management Federal Services, Inc., Northwest Operations (WMNW) test engineer and the B&W Hanford Company (BWHC) project engineer and Quality Assurance (QA) representative. The results of such a decision shall be written in red (permanent type) ink on the original test procedure and initialed and dated by the aforementioned parties. At the conclusion of the test, any changes will be incorporated into the document with an engineering change notice.

2.0 REFERENCES

HNF-2399, *Design, Fabrication, and Assembly Criteria for Cesium Powder and Pellet Inner Containers*, B&W Hanford, Company, Richland, Washington, March 18, 1998.

Task Order Agreement Contract E42800, Task Order SW826, *Preparation of a Performance Test Plan and Performance Test of Cesium Powder and Pellet Inner Container*, BWHC-9854672, May 28, 1998.

3.0 GENERAL REQUIREMENTS

3.1 RECORDS

The WMNW test engineer shall mark one copy of this test procedure, for the testing organization, with the words "Official Copy." The official copy shall be used to record the WMNW test engineer's or the designee's signature, signifying completion of the procedure steps. The completed official copy will be given to BWHC for retention. All entries will be signed and dated. All other test data will be placed into the test file, and maintained in accordance with Project Hanford Management Contract records management requirements.

The WMNW test engineer will prepare a test report summarizing the test results. A summary table depicting test data will be included into the test report. The report, after being signed by the WMNW test engineer and the BWHC project engineer and QA representative, will be distributed to all involved personnel and the customer.

3.2 MEASURE OF SUCCESS

The performance test will be successful when all pretest activities, tests, and post-test activities are completed and recorded in an accurate manner.

3.3 SAFETY

The test facility shall be responsible for reviewing and establishing safety requirements for its portion of the tests.

3.4 PRETEST MEETINGS

Prior to testing, the facility test engineer or designee shall conduct a pretest meeting with all test personnel to review the test procedure and schedule for the day. Safety requirements shall be reviewed along with any special instructions.

3.5 PHOTOGRAPHY

The test facility at the 305 Building shall be responsible for providing photographic evidence of each test setup and the test results.

3.6 EXPECTED DATA

The expected data obtained from these tests shall consist of still pictures, written observations from visual examinations, and the completed test procedures, including equipment calibration data and test details.

3.7 MATERIAL TRANSFER FORM

The BWHC Material Transfer Form (included in Appendix A) shall be completed anytime the test units change custody or building locations. In addition, a copy of the form shall be provided to the BWHC project engineer or designee by the individual receiving the test units.

4.0 PREREQUISITES

4.1 SAFETY

All test operations shall be conducted in a safe and approved manner by authorized personnel. The facility test engineer shall be responsible for approving, authorizing, and maintaining the safety of personnel and equipment at the test facility. The facility test engineer shall review procedures with all test personnel at the start of each test series.

4.2 PERSONNEL REQUIREMENTS

All test personnel shall have received any required special training prior to participating in the tests. All test operations shall be conducted by authorized personnel. A copy of the test procedures shall be reviewed by all test personnel at the start of each test.

The Quality Control (QC) representative, whose signature indicates observation and acceptance of satisfactory completion of any or all test conditions identified in this test procedure, shall have current Level II qualification/certification in the Basic and Mechanical Inspection disciplines. Copies of certifications shall be included in the data package for each signatory QC representative witnessing the included testing activities of these tests.

4.3 WITNESSES

All required test procedure signature points will be signed off and witnessed by the WMNW test engineer, the BWHC project engineer (or designee), and the BWHC QC representative for each test. The QC representative shall verify and record the current calibration status and acceptable indicating range for each instrument used for establishing test conditions and recording of data. Test conditions and parameters shall be verified as acceptable and will be implicit in the QC representative signature following the completion of each test.

5.0 TEST EQUIPMENT

The test equipment will be provided by the 305 Building facility or by BWHC. All test equipment shall be currently calibrated, and a copy of the calibration sheets shall be provided to the WMNW test engineer. The test specimens will be provided by BWHC.

6.0 DETAILED TEST PROCEDURE

The Inner Container is designed to hold Cesium parts and pieces and provide a water tight seal during decontamination of its external surface. If changes need to be taken during testing, these steps will be documented within this test plan, and concurrence will be provided by the WMNW test engineer, BWHC project engineer (or designee), and the BWHC QC representative. A decision point has been added after each section to determine how to proceed.

To demonstrate the sealing capabilities of the Inner Container seal, three prototypic Inner Containers will be subjected to a heat/water immersion test. The Container will be heated to an approximate temperature, and the closure cap will be placed onto each Container then torqued to 25 ft-lbs. The test specimen will be cooled to an approximate temperature and placed into a pool of water that contains a leak-detection agent (fluorescein). If no in-leakage of fluorescein water into the Inner Container is observed, additional testing will not be required.

If fluorescein water in-leakage is detected the Inner Containers will be cleaned out, and the Inner Containers will be subjected to an optional water immersion test. The closure cap on each Inner Container will be torqued to 25 ft-lbs. If no leakage of water into the Inner Container is observed, additional testing will not be required.

If water in-leakage is detected the Inner Containers will be cleaned out, the closure cap on each on each Inner Container will be torqued to 25 ft-lbs, and the Inner Containers will be subjected to an 2-minute water wash from a hose attached to a water container that is 4 feet above the elevation the test is conducted at. If no leakage of water is detected, additional testing will not be required.

If water in-leakage is detected the Inner Containers will be cleaned out, the closure cap on each Inner Container will be torqued to 25 ft-lbs and the containers will be subjected to a vigorous scrub using water saturated rags for a period of 5 minutes. If no leakage of water is detected, additional testing will not be required.

If water in-leakage is detected the Inner Containers will be cleaned out, the closure cap on each Inner Container will be torqued to 25 ft-lbs and the containers will be subjected to a vigorous 5-minute scrub using dampened rags. If no leakage of water is detected, additional testing will not be required.

If water in-leakage is detected, BWHC Cesium Legacy project management will be consulted to determine path forward. Optional test procedures provided in Appendix B. If BWHC Cesium Legacy project management determines that a higher torque value is to be tested, follow the additional water immersion test procedure provided in Appendix C.

A copy of the test results will be forwarded to BWHC Cesium Legacy cognizant engineer upon successful completion of the test procedure.

6.1 PRETEST REQUIREMENTS

The following items will be verified prior to starting the test.

- 1. The lid and body of each test specimen shall be permanently and uniquely marked to ensure traceability of the test specimen throughout the test. The identification marking of the lid for each test specimen shall match the identification marking of the test specimen body.
- 2. The BWHC material transfer form (included in Appendix A) shall be completed, and a copy of this form shall be provided to the BWHC project engineer or designee by the recipient of the test specimens.
- 3. Each test specimen shall be fabricated to drawing H-3-307832.
- 4. Test apparatus is ready and instruments are calibrated.

All requirements specified in Section 6.1 are completed. Authorization is granted to assemble the test specimens and start the test.

WMNW Test Engineer Date

BWHC Project Engineer Date

BWHC QC Representative Date

6.2 PREPARATION OF TEST SPECIMENS

1. Ensure that each test specimen is clean and dry.

All test specimen preparation requirements specified in Section 6.2 are completed. Authorization is granted to start the test.

 WMNW Engineer Date

 BWHC Project Engineer Date

 BWHC QC Representative Date

6.3 HEAT/WATER IMMERSION TEST

TEST NUMBER 1

The heat/water immersion test consists of heating the test specimens to approximately 200°C (392°F), placing the closure cap onto each Container and torquing the cap to 25 ft-lbs. The test specimen will be free-air cooled to approximately 100°C (212°F) and the closure cap torque reverified to 25 ft-lbs. The specimen will then be placed into a pool of water that contains a leak-detection agent (fluorescein). The test specimens will be placed into the water to a depth of 8.1 ft (+0.5/-0 ft) for a period of at least 5 minutes. After the test, the closure cap will be removed and the inside of the test specimen will be examined for in-leakage of fluorescein water. In addition, the threads and seals will be inspected for galling. The detailed procedure follows.

1. Heat the Container to approximately 200°C (392°F) and remove from oven. (The closure cap will not be heated.) Record the temperature in the table below.
2. Install the closure cap and **polished seal** on the test specimen. Using the BWHC provided spanner, torque the closure cap to 25 ft-lbs. Record torque wrench calibration information, test specimen torque values, and type of seal below.

Torque Wrench Identification: _____

Next Calibration Due Date: _____

Acceptable Range: _____

TEST SPECIMEN NUMBER	TYPE OF SEAL INSTALLED	HEATED CONTAINER TEMP.	INITIAL CLOSURE CAP TORQUE VALUE	COOLED TEST SPEC. TEMP.	VERIFIED CLOSURE CAP TORQUE VALUE	RE-TORQUE REQ'D (Y / N)
C-PP10						
C-PP11						
C-PP12						

- Free-air cool the test specimen to approximately 100°C (212°F). Record the temperature in the table above.
- Verify that the torque on the closure cap is 25 ft-lbs. Re-torque to 25 ft-lbs if needed. Record the verified closure cap torque value in the table above, and indicate if re-torquing was required.
- Place the test specimen into an appropriate holder and lower the specimen into the pool of fluorescent water to a depth of 8.1 ft (+0.5, - 0 ft) (use 8 feet, 8 inches). The immersion depth is measured from the top of the water to the upper most surface of the test specimen. Hold the test specimen at the prescribed depth for at least 5 minutes. Remove the test specimen. This test will be conducted on all three test specimens. Record the following:

Test Specimen: _____
 Immersion Depth: _____
 Start Time: _____
 End Time: _____

Test Specimen: _____
 Immersion Depth: _____
 Start Time: _____
 End Time: _____

Test Specimen: _____
 Immersion Depth: _____
 Start Time: _____
 End Time: _____

9. If galling is found, determine if it will affect the results of any additional testing.
10. If no in-leakage of fluorescent water is found and additional testing will be performed, proceed to Appendix B.
11. If additional testing will not be performed, clean the test specimens to remove the fluorescein, and notify the BWHC project engineer for disposition of the test specimens.

APPENDIX A
MATERIAL TRANSFER FORM

DRIVER/CARRIER _____ DATE _____

MATERIAL/ITEM NO.

RECEIVED FROM _____ DATE _____

DELIVER TO _____ DATE _____

ACCEPTED BY _____ DATE _____

REMARKS _____

QC VERIFICATION BY _____ DATE _____

This page intentionally left blank.

APPENDIX B
OPTIONAL TESTS

B.1 OPTIONAL WATER IMMERSION TEST

If optional water immersion tests are desired, proceed with the following steps.

B.1.1 Preparation of Test Specimens

A mixture of flour and fluorescein will be placed in each of the test units and the closure cap and seal will be installed and torqued. The flour and fluorescein mixture will aid in the detection of any water that may leak into the test specimens. The detailed preparation procedures are as follows.

1. Ensure that each test specimen is clean and dry.
2. Determine if any galling found will affect the result of this test.
3. Prepare three mixtures of ¼ cup flour and ¼ tsp fluorescein. Place one mixture into each test specimen.

NOTE: Caution should be used to ensure that none of the mixture comes in contact with the test specimen outer surface or closure threads.

4. Install the closure cap and seal on each test specimen. Ensure that the identification marking of the lid mates with the identification marking of the body. **On one test specimen use a BWHC fabricated seal; on the other two test specimens use BWHC procured seals.** Using the BWHC provided spanner, torque each closure cap to 25 ft-lbs. Record torque wrench calibration information, test specimen torque values, and type of seal below.

Torque Wrench Identification: _____

Next Calibration Due Date: _____

Acceptable Range: _____

TEST SPECIMEN NUMBER	TYPE OF SEAL INSTALLED	CLOSURE CAP TORQUE VALUE
C-PP10		
C-PP11		
C-PP12		

5. If needed, clean the external surface of the test specimens.

All test specimen preparation requirements specified in Section B.1.1 are completed. Authorization is granted to start the test.

WMNW Test Engineer Date

BWHC Project Engineer Date

BWHC QC Representative Date

B.1.2 Optional Water Immersion Test

TEST NUMBER _____

The optional water immersion test consists of placing the test specimens in a pool of water to a depth of 8.1 feet for two periods of at least 5 minutes each. After the test, the closure caps will be removed and the inside of each test specimen will be examined for water. In addition, the threads and seals will be inspected for galling. The detailed procedure follows.

NOTE: The water temperature of the immersion pool and the test facility air temperature will be verified prior to the start of this test. If additional steps need to be taken during testing to ensure that a vacuum is not created within the inner container, these steps will be documented within this test plan, and concurrence will be provided by the WMNW test engineer, BWHC project engineer (or designee), and the BWHC QC representative.

TEST SPECIMEN NUMBER	TEMPERATURE OF POOL	BLDG AIR TEMPERATURE
C-PP10		
C-PP11		
C-PP12		

- Place the three test specimens in an appropriate holder and lower the specimens into the pool of water to a depth of 8.1 feet (+0.5, -0 ft) (use **8 feet, 8 inches**). The immersion depth is measured from the top of the water to the upper most surface of the test specimens. Hold the test specimens at the prescribed depth for at least 5 minutes. Remove the test specimens and repeat the immersion test for another period of at least 5 minutes. Record the following:

Period 1

Immersion Depth: _____

Start Time: _____

End Time: _____

Period 2

Immersion Depth: _____

Start Time: _____

End Time: _____

2. After the test is completed, towel dry the test specimens to remove any visible moisture on the external surfaces. Pay particular attention to the seal area to ensure all moisture is removed.
3. Remove the closure cap from each test specimen. Record the breakaway torque value below for each test specimen as appropriate.

TEST SPECIMEN NUMBER	BREAKAWAY TORQUE VALUE
C-PP10	
C-PP11	
C-PP12	

4. Visually examine the interior of each test specimen for water. If needed, use a black light. Use the table below to note any moisture detection to the seal area, gasket, threads, and inside the test specimen. Use the table below to note any galling of the threads or seal. In addition, record any additional information as needed for documentation purposes.

TEST SPECIMEN NUMBER	MOISTURE				GALLING	
	SEAL	GASKET	THREADS	INSIDE	THREADS	SEAL
C-PP10						
C-PP11						
C-PP12						

WMNW Test Engineer_____
Date_____
BWHC Project Engineer_____
Date_____
BWHC QC Representative_____
Date

5. If galling is found, determine if it will affect the results of any additional testing.
6. If no water is found and additional testing will be performed, proceed to Section B.2 to continue with optional tests, or to Appendix C for additional water immersion testing using a different torque value.
7. If additional testing will not be performed, clean the test specimens to remove the flour and fluorescein mixture, and notify the BWHC project engineer for disposition of the test specimens.

B.2 WATER SPRAY TESTS

If water spray tests are desired, proceed with the following steps.

B.2.1 Preparation of Test Specimens

A mixture of flour and fluorescein will be placed in each of the test units and the closure cap and seal will be installed and torqued. The flour and fluorescein mixture will aid in the detection of any water that may leak into the test specimens. The detailed preparation procedures follow.

1. Ensure that each test specimen is clean and dry.
2. Determine if any galling found prior to conducting this test will affect the result of this test.
3. The flour and fluorescein mixture used in the previous test may be used if adequate. If not adequate, remove the old flour and fluorescein mixture and prepare three new mixtures of $\frac{1}{4}$ cup flour and $\frac{1}{4}$ tsp fluorescein. Place one mixture into each test specimen.

NOTE: Caution should be used to ensure that none of the mixture comes in contact with the test specimen outer surface or closure threads.

4. Install the closure cap and seal on each test specimen. Ensure that the identification marking of the lid mates with the identification marking of the body. **On one test specimen use a BWHC fabricated seal; on the other two test specimens use BWHC procured seals.** Using the BWHC provided spanner, torque each closure cap to 25 ft-lbs. Record torque wrench calibration information, test specimen torque values, and type of seal below.

Torque Wrench Identification: _____

Next Calibration Due Date: _____

Acceptable Range: _____

TEST SPECIMEN NUMBER	TYPE OF SEAL INSTALLED	CLOSURE CAP TORQUE VALUE
C-PP10		
C-PP11		
C-PP12		

- If needed, clean the external surface of the test specimens.

All test specimen preparation requirements specified in Section B.2.1 are completed. Authorization is granted to start the test.

WMNW Test Engineer Date

BWHC Project Engineer Date

BWHC QC Representative Date

B.2.2 Water Spray Test

TEST NUMBER _____

The water spray test consists of spraying water with a head of 4 feet on the seal area of the container for two periods of at least 2 minutes each. After the test, the closure caps will be removed and the inside of each test specimen will be examined for water. In addition, the threads and seals will be inspected for galling. The detailed procedure follows.

- Place the three test specimens in an appropriate holder. Rig a container filled with water and equipped with a spigot in a position approximately 4 feet higher than the elevation of the top of the test specimens. Attach a 3/8-inch diameter tygon tube to the container spigot. Allow the water to gravity feed down the tube and spray the seal areas of the test specimens for a period of 2 minutes. The water container height is measured from the bottom of the water container to the upper most surface of the test specimens. At the end of the first period, refill the water container and repeat the spray test for another period of at least 2 minutes. Record the following:

Period 1

Water Container Height: _____
 Start Time: _____
 End Time: _____

Period 2

Water Container Height: _____
 Start Time: _____
 End Time: _____

2. After the test is completed, towel dry the test specimens to remove any visible moisture on the external surfaces. Pay particular attention to the seal area to ensure all moisture is removed.
3. Remove the closure cap from each test specimen. Record the breakaway torque value below for each test specimen as appropriate.

TEST SPECIMEN NUMBER	BREAKAWAY TORQUE VALUE
C-PP10	
C-PP11	
C-PP12	

4. Visually examine the interior of each test specimen for water. If needed, use a black light. Use the table below to note any moisture detection to the seal area, gasket, threads, and inside the test specimen. Use the table below to note any galling of the threads or seal. In addition, record any additional information as needed for documentation purposes.

TEST SPECIMEN NUMBER	MOISTURE				GALLING	
	SEAL	GASKET	THREADS	INSIDE	THREADS	SEAL
C-PP10						
C-PP11						
C-PP12						

- Install the closure cap and seal on each test specimen. Ensure that the identification marking of the lid mates with the identification marking of the body. **On one test specimen use a BWHC fabricated seal; on the other two test specimens use BWHC procured seals.** Using the BWHC provided spanner, torque each closure cap to 25 ft-lbs. Record torque wrench calibration information, test specimen torque values, and type of seal below.

Torque Wrench Identification: _____

Next Calibration Due Date: _____

Acceptable Range: _____

TEST SPECIMEN NUMBER	TYPE OF SEAL INSTALLED	CLOSURE CAP TORQUE VALUE
C-PP10		
C-PP11		
C-PP12		

- If needed, clean the external surface of the test specimens.

All test specimen preparation requirements specified in Section B.3.1 are completed. Authorization is granted to start the test.

WMNW Test Engineer Date

BWHC Project Engineer Date

BWHC QC Representative Date

B.3.2 Scrub Test Using Water Saturated Rags

TEST NUMBER _____

This test consists of subjecting each test specimen to a vigorous scrubbing using water saturated rags for a period of at least 5 minutes. After the test, the closure caps will be removed and the inside of each test specimen will be examined for water. The detailed procedure is as follows.

- Place a test specimen in an appropriate holder. Saturate several rags with water and vigorously scrub the test specimen seal area for at least 5 minutes. Repeat the test for the other two test specimens. Record the following:

Test Specimen Number: _____

Start Time: _____

End Time: _____

Test Specimen Number: _____

Start Time: _____

End Time: _____

Test Specimen Number: _____

Start Time: _____

End Time: _____

2. After the test is completed, towel dry the test specimens to remove any visible moisture on the external surfaces. Pay particular attention to the seal area to ensure all moisture is removed.
3. Remove the closure cap from each test specimen. Record the breakaway torque value below for each test specimen as appropriate.

TEST SPECIMEN NUMBER	BREAKAWAY TORQUE VALUE
C-PP10	
C-PP11	
C-PP12	

4. Visually examine the interior of each test specimen for water. If needed, use a black light. Use the table below to note any moisture detection to the seal area, gasket, threads, and inside the test specimen. Use the table below to note any galling of the threads or seal. In addition, record any additional information as needed for documentation purposes.

TEST SPECIMEN NUMBER	MOISTURE				GALLING	
	SEAL	GASKET	THREADS	INSIDE	THREADS	SEAL
C-PP10						
C-PP11						
C-PP12						

- Install the closure cap and seal on each test specimen. Ensure that the identification marking of the lid mates with the identification marking of the body. **On one test specimen use a BWHC fabricated seal; on the other two test specimens use BWHC procured seals.** Using the BWHC provided spanner, torque each closure cap to 25 ft-lbs. Record torque wrench calibration information, test specimen torque values, and type of seal below.

Torque Wrench Identification: _____

Next Calibration Due Date: _____

Acceptable Range: _____

TEST SPECIMEN NUMBER	TYPE OF SEAL INSTALLED	CLOSURE CAP TORQUE VALUE
C-PP10		
C-PP11		
C-PP12		

- If needed, clean the external surface of the test specimens.

All test specimen preparation requirements specified in Section B.4.1 are completed. Authorization is granted to start the test.

WMNW Test Engineer Date

BWHC Project Engineer Date

BWHC QC Representative Date

B.4.2 Water Scrub Test Using Dampened Rag

TEST NUMBER _____

This test consists of subjecting each test specimen to a vigorous scrubbing using water dampened rags for a period of at least 5 minutes. After the test, the closure caps will be removed and the inside of each test specimen will be examined for water. The detailed procedure is as follows.

- Place a test specimen in an appropriate holder. Dampen several rags with water and vigorously scrub the test specimen seal area for at least 5 minutes. Repeat the test for the other two test specimens. Record the following:

Test Specimen Number: _____

Start Time: _____

End Time: _____

Test Specimen Number: _____

Start Time: _____

End Time: _____

Test Specimen Number: _____

Start Time: _____

End Time: _____

2. After the test is completed, towel dry the test specimens to remove any visible moisture on the external surfaces. Pay particular attention to the seal area to ensure all moisture is removed.
3. Remove the closure cap from each test specimen. Record the breakaway torque value below for each test specimen as appropriate.

TEST SPECIMEN NUMBER	BREAKAWAY TORQUE VALUE
C-PP10	
C-PP11	
C-PP12	

4. Visually examine the interior of each test specimen for water. If needed, use a black light. Use the table below to note any moisture detection to the seal area, gasket, threads, and inside the test specimen. Use the table below to note any galling of the threads and seal. In addition, record any additional information as needed for documentation purposes.

TEST SPECIMEN NUMBER	MOISTURE				GALLING	
	SEAL	GASKET	THREADS	INSIDE	THREADS	SEAL
C-PP10						
C-PP11						
C-PP12						

APPENDIX C

**ADDITIONAL WATER IMMERSION TESTING
DUE TO TORQUE VALUE CHANGE**

C.1 ADDITIONAL WATER IMMERSION TESTS

If additional water immersion tests are desired by use of a torque value other than that identified in Appendix B, Section B.1 of this procedure, proceed with the steps that follow.

C.1.1 Preparation of Test Specimens

A mixture of flour and fluorescein will be placed in each of the test units and the closure cap and seal will be installed and torqued. The flour and fluorescein mixture will aid in the detection of any water that may leak into the test specimens. The detailed preparation procedures are as follows.

1. Ensure that each test specimen is clean and dry.
2. Determine if any galling found from previous tests will affect the result of this test.
3. The flour and fluorescein mixture used in previous tests may be used if adequate. If not adequate, remove the old flour and fluorescein mixture and prepare three new mixtures of ¼ cup flour and ¼ tsp fluorescein. Place one mixture into each test specimen.

NOTE: Caution should be used to ensure that none of the mixture comes in contact with the test specimen outer surface or closure threads.

4. Install the closure cap and seal on each test specimen. Ensure that the identification marking of the lid mates with the identification marking of the body. **On one test specimen use a BWHC fabricated seal; on the other two test specimens use BWHC procured seals.** Using the BWHC provided spanner, torque each closure cap to a pre-determined torque value, other than what has been used for previous testing. Record torque wrench calibration information, test specimen torque values, and type of seal below.

Torque Wrench Identification: _____

Next Calibration Due Date: _____

Acceptable Range: _____

TEST SPECIMEN NUMBER	TYPE OF SEAL INSTALLED	CLOSURE CAP TORQUE VALUE
C-PP10		
C-PP11		
C-PP12		

Period 1

Immersion Depth: _____

Start Time: _____

End Time: _____

Period 2

Immersion Depth: _____

Start Time: _____

End Time: _____

2. After the test is completed, towel dry the test specimens to remove any visible moisture on the external surfaces. Pay particular attention to the seal area to ensure all moisture is removed.
3. Remove the closure cap from each test specimen. Record the breakaway torque value below for each test specimen as appropriate.

TEST SPECIMEN NUMBER	BREAKAWAY TORQUE VALUE
C-PP10	
C-PP11	
C-PP12	

4. Visually examine the interior of each test specimen for water. If needed, use a black light. Use the table below to note any moisture detection to the seal area, gasket, threads, and inside the test specimen. Use the table below to note any galling of the threads or seal. In addition, record any additional information as needed for documentation purposes.

TEST SPECIMEN NUMBER	MOISTURE				GALLING	
	SEAL	GASKET	THREADS	INSIDE	THREADS	SEAL
C-PP10						
C-PP11						
C-PP12						

DISTRIBUTION SHEET

To	From	Page 1 of 1			
Distribution	Packaging Engineering	Date 07/06/98			
Project Title/Work Order		EDT No. 622374			
Cesium Powder and Pellets Inner Container Decontamination Method Determination Test (HNF-2945)		ECN No. NA			
Name	MSIN	Text With All Attach	Text Only	Attach. / Appendi x Only	EDT/ECN Only
E. J. Bitten	L1-02	X			
P. C. Ferrell	H1-15	X			
J. G. Field	H1-15				
C. R. Hoover	H1-15	X			X
D. L. Kelly	H1-15	X			
S. D. Landsman	L5-32	X			
P. V. Meeuwsen	L6-13	X			
D. H. Sandoz	L1-06	X			
HNF-2945 File	H1-15	X			
Work Control (D. Kelly)	H1-15				X
Central Files	B1-07	X			