

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1.	a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
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2. PREAMBLE

- a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, *Code of Federal Regulations*, Part 71, "Packaging and Transportation of Radioactive Material."
- b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

- | | |
|--|---|
| a. ISSUED TO (<i>Name and Address</i>)
Battelle Savannah River Alliance, LLC.
Savannah River Site
Aiken, SC 29808 | b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
Safety Analysis Report Model 9979 Type AF Shipping
Package application, S-SAR-G-00002, Revision No. 2. |
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4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

- (1) Model No.: 9979
- (2) Description

The Model No. 9979 package is composed of one 55-gallon drum overpack and one 30-gallon inner drum.

The 55-gallon drum and its lid, fabricated from 16-gauge carbon steel, include a welded steel liner containing a polyurethane foam for thermal insulation and structural support. When installed, the lid assembly extends into the drum body liner. An EPDM gasket seals the overpack closure. The 30-gallon inner drum, fabricated from 16-gauge carbon steel, is positioned centrally, both radially and axially, within the 55-gallon drum overpack steel liner. The inner drum, which secures the radioactive contents payload, is the containment boundary for the package. A silicon gasket seals the 30-gallon containment drum closure.

An optional Compact Augmented Permeation System (CAPS) may be installed in the second bung location of the 30-gallon drum lid to provide a passive hydrogen permeation pathway during normal conditions of transport (NCT). CAPS enables hydrogen to diffuse out of the 30-gallon drum without venting radionuclides.

Reinforced split-ring devices, fabricated from 12-gauge carbon steel, provide secure closures for both the 30-and 55-gallon drums. Tamper Indicating Devices (TID) can be inserted through the lugs welded at each end of the two split-rings for both the 55-and 30-gallon drums.

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Two thermal insulation components, made of a ceramic fiber mat sandwiched and sewn between flexible fiberglass woven cloth, are added to the packaging: a quilted insulation cover, 21 ½ inches in diameter by ½ inch thick is positioned between the 30-gallon and 55-gallon drum closure lid and an insulation bag is installed in the 30-gallon drum.

The 55-gallon drum is nominally 23 inches in diameter and 34 ½ inches in height. The nominal weight of the overpack (body, closure lid and split-ring closure device) is 174.5 lb. The 30-gallon drum is nominally 18.6 inches in diameter and 29 inches in height. The 30-gallon drum with its lid and the split-ring closure weighs approximately 50 lbs.

When CAPS is installed, a small waterproof-barrier-protected diffusion hole is added under the curl of the 55-gallon drum to allow hydrogen permeating through CAPS to exit the overpack. The barrier consists of a hydrophobic, porous PTFE adhesive-backed disk (item 13 in Drawing R-R2-G-00057, Rev. 13) designed to permit hydrogen flow while preventing water intrusion.

The gross weight of a fully loaded package shall not exceed 415 lb.

(3) Drawings

The package is constructed in accordance with the following drawings:

Drawing No. R-R1-G-00026, 9979 Type AF 30-Gallon Container Split Ring Assembly (U)	Rev. 8
Drawing No. R-R1-G-00027, 9979 Type AF 55-Gallon Drum Lid Split Ring Assembly (U)	Rev. 7
Drawing No. R-R1-G-00028, 9979 Type AF 30-Gallon Drum Assembly (U)	Rev. 9
Drawing No. R-R1-G-00029, 9979 Type AF 55-Gallon Drum Assembly (U)	Rev. 6
Drawing No. R-R1-G-00030, 9979 Type AF Packaging Assembly (U)	Rev. 5
Drawing No. R-R2-G-00057, 9979 Type AF 55-Gallon Drum Sub-Assembly and Weldment (U)	Rev. 13
Drawing No. R-R2-G-00058, 9979 Type AF 30-Gallon Drum (U)	Rev. 7
Drawing No. R-R2-G-00059, 9979 Type AF 55-Gallon Drum Lid Sub-Assembly and Weldment (U)	Rev. 8
Drawing No. R-R2-G-00060, 9979 Type AF 30-Gallon Drum Lid with Dual Bung Closures (U)	Rev. 8
Drawing No. R-R4-G-00062, 9979 Type AF 30-Gallon Drum Lid Gasket (U)	Rev. 6
Drawing No. R-R4-G-00064, 9979 Type AF Insulation Bag	Rev. 5
Drawing No. R-R4-G-00065, 9979 Type AF Insulation Cover Assembly for 30-Gallon Drum	Rev. 5
Drawing No. R-R4-G-00163, 9979 Texas A&M AGN 30-Gallon Drum Payload Insert (U)	Rev. 1
Drawing No. R-R4-G-00164, 9979 Texas A&M AGN 30-Gallon Drum Foam Spacers (U)	Rev. 1
Drawing No. R-R4-G-00066, 9979 Type AF Package Identification Plate	Rev. 2

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5. continued

(b) Contents

(1) Type and form of material

The authorized contents for the Model No. 9979 package consist of solid fissile and non-fissile radioactive materials, and associated non-radioactive materials, contained within the 30-gallon drum, meeting the categorical definitions, mass limits, moderation limits, and hydrogen-control requirements specified in tables 1-4.

Table 1: Authorized Material Categories

Category	Description	Restrictions
Fissile Material	Uranium enriched to ≤ 19.9 wt% U-235 (LEU) or HEU	Must meet U-235 mass limits (Table 3)
Non-Fissile Radioactive Solids	Metals, oxides, compounds, residues from uranium operations	Solid only; no free liquid
Carbon-Bearing Solids	Graphite, carbon composites, carbon scrap molds, reduction sand	Carbon mass affects criticality
Combustible Solids	Plastics, rubber, paper, cloth, wipes, mop heads, HEPA/demister filters	Hydrocarbon mass limits; hydrogen control
Non-Combustible Solids	Ceramics, glass, crucibles, slag (MgO, CaF_2 , LiF), borax pellets, asbestos/firebrick	Must meet fissile/moderation limits
Solid Uranium Compounds	Uranyl fluoride, UO_4 , ADU, oxides, unirradiated fuel rods, LWBR fuel pieces	Solid only
Encapsulated Standards	LEU plates, cubes, calibration standards	Must meet fissile limits

Table 2: Allowed Non-Radioactive Materials

Material Type	Examples
Plastics & rubber	HDPE, PVC, neoprene, nitrile, gaskets
Cellulosics	Paper, cloth, wipes
Refractory & insulation solids	Firebrick, slag residues, MgO, CaF_2 , LiF
Miscellaneous solids	Sponges, mop heads, filters, floor sweepings

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5.(b)(1) continued

(2) Maximum quantity of material per package:

Table 3: Fissile Mass & Moderation Limits

Radioactive Material Limit	Fissile Material Limits	Nonradioactive Material Limits		
	²³⁵ U FGE ^a	Graphite/Carbon	Beryllium	Plastics
A ₂	350 g	1 kg ^b		1 kg
	350 g	90 kg ^c	0 kg	1 kg
	300 g	1 kg ^b		90 kg
	150 g	90 kg	0 kg	1 kg

Table Notes:

a. Fissile material masses are calculated using the following equations:

$$\text{FGE Mass} = {}^{233}\text{U} + [4.1 \times {}^{235}\text{U}] + [4.1 \times \text{Pu}] \text{ AND}$$

$${}^{233}\text{U} + \text{Pu} \leq 5 \text{ wt\% total fissile mass}$$

b. This limit applies to the sum of beryllium and carbon.

c. Fissile materials and carbon must be physically or chemically bonded.

(3) Maximum weight of contents:

Maximum payload – 200 lb

Maximum package weight – 415 lb

(4) Maximum decay heat: 163 milliwatts

6. The Criticality Safety Index (CSI) is 1.0.

7. No free liquid is permitted.

8. All contents and packing/dunnage shall be packaged with a thermal insulation cover (R-R4-G-00065). Combustible radioactive contents require a thermal insulation bag in the 30-gallon drum.

9. In addition to the requirements of Subpart G of 10 CFR Part 71:

(a) The package shall be prepared for shipment and operated in accordance with the Operating Procedures in Section 7 of the application; and

(b) The package must meet the Acceptance Tests and Maintenance Program of Section 8.0 of the application.

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- (c) When CAPS is installed, operating procedures shall include installation verification, visual inspection for membrane or housing damage, and confirmation that the diffusion hole barrier is intact. CAPS shall not be used if any component exhibits damage or blockage. CAPS installation and inspection requirements are as defined in M-DS-G-00124 and M-DS-A-00124.

Table 4: Hydrogen Control (CAPS Requirements)

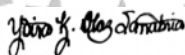
Requirement	Description
CAPS option	Optional device installed in second bung-hole to permeate hydrogen
Diffusion hole	Waterproof-barrier-protected PTFE disk allows hydrogen to exit overpack
When CAPS required	When hydrogenous/radiolytic materials could reach flammable limits
If CAPS not installed	Contents must be configured to prevent flammable hydrogen accumulation

10. Package may be shipped as non-exclusive use conveyance. For shipments under this certificate, the package identification number on the nameplate of existing packages shall have the "DOE" marking covered.
11. Transport of fissile material by air is not authorized.
12. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
13. Expiration date: September 30, 2031.

REFERENCES

Safety Analysis Report Model 9979 Type AF Shipping Package application, S-SAR-G-00002, Revision No.2, dated May 12, 2026.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Signed by Yoira Diaz-Sanabria on 09/08/26

Yoira Diaz Sanabria, Chief
Storage and Transportation Licensing Branch
Division of Storage of Fuel, Transportation,
and Environmental
Office of Nuclear Material Safety
and Safeguards

Date: September 8, 2026