Safety Evaluation Report for Safety Analysis Report for Packaging Model 9975, S-SARP-G-00003, Revision 2

Docket No. 11-28-9975 and Docket 13-16-9975

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SUMMARY

The Department of Energy Savannah River Operations Office (DOE-SR) submitted an application dated June 30, 2011, to the U.S. Department of Energy (DOE) Packaging Certification Program (PCP), Office of Packaging and Transportation, requesting that DOE review a Safety Analysis Report for Packaging (SARP) on the Model 9975 for approval and to issue a Certificate of Compliance (CoC). The application request included a 9975 SARP, identified as S-SARP-G-00003, Revision 1, dated May 2011, to provide the necessary documentation for the review and approval.

The SARP is the consolidation of two previously approved 9975 SARPs (WSRC SA-2002-00008, Revision 0 [2], and S-SARP-G-00003, Revision 0 [3]), as well as the incorporation of three approved addenda,[4–6] since the last revisions of both SARPs. WSRC-SA-2002-00008, Revision 0, is the original 9975 SARP listed in the -85 certificate, and S-SARP-G-00003, Revision 0, is the 9975 SARP listed in the -96 certificate. The three addenda were to add the content envelopes C.9[4], C.10 and C.11[5] and an option of using the RFID system on the 9975 package.[6]

All other previous addenda and letter amendments to either the 9975 -85 or -96 certificates, which are not mentioned above, are not to be retained for shipments under the 9975 consolidated SARP.

Model 9975 Packagings with serial numbers less than 6000 were originally designated as "USA/9975/B(M)F-85 (DOE) TYPE B." No design change to the 9975 -85 packaging was necessary for compliance to the -96 requirements. Therefore, 9975 packages currently labeled as USA/9975/B(M)F-85 meet the performance criteria for a Type B(M)F-96 and may continued to be used for long-term storage. 9975-85 packaging used for transportation shall be converted to 9975-96 packaging following the procedures of Chapter 7 of the SARP by June 30, 2015. 9975-85 packaging that is taken out of storage and that will be used for transport in commerce after June 30, 2015, must be converted to 9975-96 packaging following the procedures of Chapter 7 before it can be used for transport. The upgrade must follow the requirements of Drawing R-R2-F-0025 in Appendix 1.1 of the SARP. After a packaging upgrade is completed, annual maintenance described in Section 8.2 of the SARP should be performed after marking the packaging and before continuing with Section 7.2.1, *Preparation for Loading*.

DOE PCP staff reviewed the consolidated 9975 SARP, S-SARP-G-00003, Revision 1, and generated twelve (12) Q1 questions from the nine (9) Chapters of the SARP. The applicant responded to all of the questions and provided acceptable revisions to the SARP Revision 2.[7]

On the basis of the statements and representations of the consolidated 9975 SARP[7] and the DOE PCP staff's confirmatory evaluation, as summarized in this Safety Evaluation Report (SER), DOE PCP finds that the design and performance of the 9975 package is acceptable and will provide reasonable assurance that the regulatory requirements of 49 CFR Part 173, 10 CFR Part 71, and DOE Order 460.1C have been met.

DOE PCP has concluded that the following conditions of approval need to be added to the CoC pursuant to the approval of the application request:

1. *No design change to the 9975 -85 packaging was necessary for compliance to the -96 requirements. Therefore, 9975 packages currently labeled as USA/9975/B(M)F-85 meet the performance criteria for a Type B(M)F-96.*

2. *Except for the content envelopes C.4 and C.11, the maximum allowable decay heat of the contents in the 9975 package shall be limited to 19 W. For the content envelopes C.4 and C.11, the local*

atmosphere dilution and the allowable decay heat shall meet the requirements specified in Table 3.4 of the SARP and Table 2 in the CoC

3. *9975-85 packaging used for transportation shall be converted to 9975-96 packaging following the requirements of Drawing R-R2-F-0025 in Appendix 1.1, and the procedures of Chapter 7 of the SARP by June 30, 2015. 9975-85 packaging that are taken out of storage and that will be used for transport in commerce after June 30, 2015, must be converted to 9975-96 packaging following the procedures of Chapter 7, and annual maintenance per Section 8.2 should be performed after re-marking the package, before continuing with Section 7.2.1, Preparation for Loading.*

4. *All commercial-grade dedication shall be approved by the design authority.*

While the review was underway for the consolidated SARP for the 9975-85 and 9975-96, a need developed for unique shipments of mixed oxides in plastic bottles. This was addressed by an Addendum to the SARP, and resulted in the issuance of DOE CoC 9975-96 Rev. 7 and its SER (copies of SERs for DOE CoCs are on RAMPAC). Shortly after Revision 7 was issued in April 2013, the Office of FSU and Asian Threat Reduction/NNSA notified DOE PCP that the content/conditions for the mixed oxides shipped in plastic bottles shown in DOE CoC Rev. 7, would not be achievable for the shipments in a foreign county. Several conference calls and a meeting were conducted and as a result, the applicant submitted a new Addendum in June 2013 which is being reviewed under Docket 13-29-9975. Because the content/conditions for the mixed oxide shipments in plastic bottles will not be used as currently shown in Revision 7 of the DOE CoC 9975-96, they will not be included in Revision 8 of the DOE CoC 9975-96, which is based on the review of the consolidated SARP for the 9975-85 and 9975-96.

Content envelope C.9 for Uranium 233 oxides and metals was approved and included in DOE CoC 9975-85 since 2008 and is documented in the SER. Content envelope C.9 for Uranium 233 oxides and metals is incorporated in the consolidated SARP for the 9975-85 and 9975-96, and will be shown as an approved content in Revision 8 to the DOE CoC 9975-96.

References

1. Letter from Patrick W. McGuire, DOE Savannah River Operations Office, to Jim Shuler, DOE Packaging Certification Program (PCP), Office of Packaging and Transportation (EM-33), "*Submittal of the Safety Analysis Report for Packaging (SARP) Model 9975 (S-SARP-G-00003, Revision 1),*" June 30, 2011.

2. Safety Analysis Report for Packaging Model 9975, WSRC-SA-2002-00008, Revision 0, December 2003.

3. Safety Analysis Report for Packaging Model 9975, S-SARP-G-00003, Revision 0, January 2008.

4. Justification for ^{233}U Content Envelope, Safety Analysis Report for Packaging Model 9975, Addendum 2, S-SARA-G-00002, Revision 1, May 2008.

5. Justification for 9975 Content Envelopes C.10 and C.11 Safety Analysis Report for Packaging Model 9975, Addendum, S-SARA-G-00007, Revision 1, August 2009.

6. Justification for Use of the Radio Frequency Identification (RFID) System Safety Analysis Report for Packaging, Model 9975, Addendum, S-SARA-G-00008, Revision 0, November 2009.

7. Safety Analysis Report for Packaging Model 9975, S-SARP-G-00003, Revision 2, June, 2013.

1. GENERAL INFORMATION AND DRAWINGS

1.1 Package Description

Detailed packaging descriptions and drawings of the package can be found in the consolidated 9975 SARP.[7] The components of the 9975 packaging include a 35-gallon drum assembly, impact-limiting and thermal-insulating material fiberboard/Celotex® (Type IV, Grade 1 per ASTM-C-208-95, density 14-16 lb/ft^3), a Primary Containment Vessel (PCV), a Secondary Containment Vessel (SCV), and the content containers. The 9975 package is designed to ship radioactive contents in two basic configurations: (1) DOE-STD-3013 containers or (2) arrangements of nested food-pack cans. Two other configurations are also used: the first is for the LLNL Measurement Standard Containers (hex-cans), and the second is a lead Shielded-Pig used for shipments of high activity sources. Descriptions, illustrations, and the packaging limitations of these configurations are provided in the SARP. The limiting dimensions for the container arrangements/configurations are discussed in Appendix 1.2 of the SARP, and content-specific configuration controls and requirements are listed in Section 1.2.3.2 of the SARP.

The 9975 packaging assembly is shown in Figure 1.1 and in Drawing R-R2-F-0026 in Appendix 1.1 of the SARP.

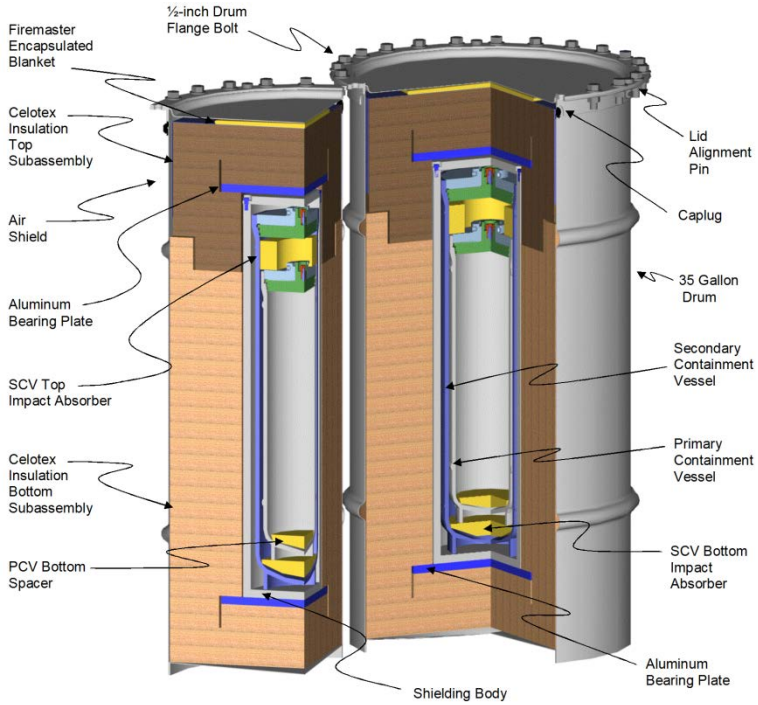

Figure 1.1 9975 Packaging 3-Dimensional Section View

Drawings

The drawings that pertain to the 9975 package are listed in Table 1.1.

Table 1.1 List of Drawings Pertaining to the 9975 Package

Drawing No.	Rev.	Title
R-R2-F-0026	5	9975 Shipping Package Drum with Flange Closure Assembly (U)
R-R2-F-0019	8	9975 Shipping Package Insulation Assembly, Subassemblies and Details (U)
R-R2-F-0020	11	9975 Shipping Package Shielding (U)
R-R2-F-0025	7	9975 Drum with Flange Closure Subassembly and Details (U)
R-R2-F-0018	10	9975 Shipping Package Primary and Secondary Containment Vessel Subassemblies (U)
R-R3-F-0016	13	9975 Shipping Package Containment Vessel Weldments (U)
R-R3-F-0015	6	9975 Shipping Package Air Shield Weldment (U)
R-R4-F-0054	14	9975 Shipping Package Primary (PCV) and Secondary (SCV) Containment Vessel Details(U)
R-R4-F-0055	5	9975 Shipping Package PCV Sleeve and 3013 Top Spacer Details (U)
R-R2-F-0037	1	9975 Packaging Alternate 3013 Spacer Components Details (U)
R-R4-G-00047	1	U-233 Lead Pig Details and Subassembly (U)
R-R4-G-00048	1	U-233 Container Details and Subassembly (U)
R-R4-G-00051	3	U-233 Spacers (U)

1.2 Contents

The evaluated contents are identified as content envelopes C.1 through C.11 and are defined in Table 1.2 of SER. The total content mass defined excludes material containers and packing materials (i.e., 3013 outer/inner storage cans, food-pack cans, convenience cans, aluminum foil, and plastic bagging).

Requirements for all content envelopes and configurations are:

- The maximum allowable radioactive decay heat rate is 19 watts.
- The maximum weight of all material (radioactive contents, product cans, spacers, etc.) to be loaded inside the PCV must not exceed 20.1 kg (44.4 lb).
- The contents are in solid form as metal pieces or oxides. Liquid contents are not permitted.
- Except as stated in Table 1.2 of SER, small concentrations (<1,000 ppm each) of other actinides, fission products, decay products, and neutron activation products are permitted. Assessment of these impurities may be based on process knowledge.
- The PCV bottom spacer must be used.

Type and Form of Contents (see Table 1.2 of SER for details):

- Uranium metal or oxide, as specified in Content Envelope C.1
- Plutonium-238 heat sources, as specified in Content Envelope C.2
- Plutonium and/or uranium metal, as specified in Content Envelope C.3 or C.10
- Plutonium and/or uranium oxide, as specified in Content Envelope C.4 or C.11

- Plutonium composites, as specified in Content Envelope C.5
- Plutonium/tantalum composites, as specified in Content Envelope C.6
- Plutonium-238 oxide/beryllium metal, as specified in Content Envelope C.7
- Neptunium oxide, as specified in Content Envelope C.8
- ^{233}Uranium metal/oxide, as specified in Content Envelope C.9

The contents are shipped in four basic configurations: (1) DOE-STD-3013 storage containers, (2) arrangements of nested food-pack cans, (3) the LLNL Measurement Standard Containers (hex-cans), and (4) a lead Shielded-Pig used for shipments of high-activity sources. A summary of the packaging requirements by contents and container configuration is provided in Table 1.3 of SER.

Table 1.2 Content Envelopes

	Material [a, b]	C.1 [c, d] U Metal/Oxide	C.2 ^{238}Pu Heat Sources	C.3 [d, e, f, g] Pu/U Metals	C.4 [e, g, h, i] Pu/U Oxides	C.5 [d, f, g, j] Pu Composites	C.6 [d, f, k] Pu/Ta Composites	C.7 ^{238}Pu Oxide/ Be Metal	C.8 [l] Neptunium Oxide
Radioisotope [m] (Weight Percent of Radioactive Material Mass)	^{236}Pu		1×10^{-4}					1×10^{-4}	
	^{238}Pu [n]		100	2	2	0.05	0.05	80	5×10^{-2}
	^{239}Pu [o]		40	100	100	100	100	40	8.8×10^{-3}
	^{240}Pu		13	50	50	6.5	6.5	13	1.5×10^{-3}
	^{241}Pu [o, p]		1	15	15	1	1	1	1.4×10^{-4}
	^{242}Pu		1.5	5	5	0.1	0.1	1.5	7.7×10^{-4}
	^{241}Am + ^{241}Pu		1	15	15	1	1	1	2.3×10^{-4}
	^{243}Am		1×10^{-4}	1×10^{-4}	1×10^{-4}	1×10^{-4}	1×10^{-4}	1×10^{-4}	
	^{244}Cm		1×10^{-4}	1×10^{-4}	1×10^{-4}	1×10^{-4}	1×10^{-4}	1×10^{-4}	
	^{237}Np		0.5	5.0	5.0				100
	^{232}U	1×10^{-5}	4×10^{-6}	1×10^{-5}	1×10^{-5}				
	^{233}U [o]	0.5	0.2	0.5	0.5				2.4×10^{-3}
	^{234}U [q]	100	40	100	100				0.47
	^{235}U [o]	100	40	100	100				0.47
	^{236}U	40	16	40	40				0.19
	^{238}U	100	40	100	100				0.47
	^{232}Th		10	23 [x]	23 [x]				2.3
Impurities (grams)	Al, B, F, Li, Mg, Na			r	r				8.0
	Be			500	500	4,400		200 [s]	0.60
	V					4,400			
	Ta					4,400	6,000		
	C			1,000	1,000				20
Total Mass (kilograms)	Radioactive Materials	13.5	0.1	4.4	4.4	4.4	2	0.02	6
	Impurities			3.08 [t]	3.08 [t]	4.4	6 [u, v]	0.2	0.07
	All Contents	13.5	0.1	4.4	5	4.4	8	0.22	6.81 [w]

Note: Table notes are on the following page.

Table 1.2 Content Envelopes (Continued)

	Material [a, b]	C.9	C.10 [d,e,f,g]	C.11 [e,g,h,i]
		^{233}U Metal/Oxides grams	P/U Metals grams	Pu/U Oxides grams
Radioisotope [m] (Radioactive Material Mass Grams)	^{236}Pu[z]			
	^{238}Pu [n]		34	34
	^{239}Pu [o]	aa	4400	4400
	^{240}Pu	bb	1450[y]	2200
	^{241}Pu [o, p]	bb	188.9	188.9
	^{242}Pu		400[y]	2200
	^{241}Am + ^{241}Pu	bb	188.9	188.9
	^{243}Am		1.00	1.00
	^{244}Cm		0.0044	0.0044
	^{237}Np		220	220
	^{232}U	0.0018[cc]	0.00044	0.00044
	^{233}U [o]	500[dd]	427	427
	^{234}U [q]	aa	4400	4400
	^{235}U [o]	aa	4400	4400
	^{236}U	4400	2640	2640
	^{238}U	4400	4400	4400
	^{232}Th		4400	4400
Impurities[ee] (grams)	Al, B, F, Li, Mg, Na		r	r
	Be		500	500
	V			
	Ta			
	C		1000	1000
Total Mass (kilograms)	Radioactive Materials	4.4	4.4	4.4
	Impurities		3.08[t]	3.08[t]
	All Contents	4.4	4.4	5

Table 1.2 – Table Notes

a	Except as permitted for oxides, all contents shall be dry.
b	Pu/U content bulk density shall be no greater than 19.84 g/cc. No minimum bulk density is specified. However, low bulk densities require dilution of the local atmosphere within the content container by a specific gas (helium or nitrogen) and/or reduction in the allowable decay heat as summarized in Table 3.4.
c	Up to 1 gram of plutonium contamination is permitted.
d	Each metal piece shall have a minimum thickness of 1.0 mm (0.04 inches) and a specific surface area less than 100 mm^2/gram (71 in^2/lb) per DOE-STD-3013. A minimum 50-gram mass per metal piece conservatively meets these criteria.
e	Mass limit due to shielding. The heat loading of each mixture needs to be determined. The 188.9 gram limit based on estimate of heat load from WCID-2009-0002 Revision 0.
f	Contents shall be stabilized in accordance with DOE-STD-3013, Section 6.1.1. [8]
g	Plutonium plus uranium mass shall not be less than 30 weight percent of the total content mass.
h	Contents shall be stabilized in accordance with DOE-STD-3013, Section 6.1.2. [8]
i	The moisture content of the oxide shall be less than 0.5 weight percent of the total content mass.
j	Depleted Uranium or Enriched Uranium may be substituted for any amount of plutonium on a gram-for-gram basis.
k	The Be, V, and Ta each form a composite with the radionuclide content and, as such, are not homogeneously mixed with the Pu. A maximum of 50 pieces of composite material is permitted.
l	Material to be prepared in accordance with WSRC-TR-2003-00388[11] which limits the moisture content of the material.
m	Maximum amounts by constituent.
n	^{238}Pu decays to ^{234}U, which will result in significant concentrations of ^{234}U over time. ^{234}U growth will not adversely impact package performance.
o	Nuclide classified as "fissile" per DOE Good Practices Guide, Criticality Safety Good Practices Program, Guide For DOE Nonreactor Nuclear Facilities, DOE G 421.1-1, 3.79 *Fissile Nuclide*, 8-25-99.
p	^{241}Pu must be less than ^{240}Pu.
q	Applies to ^{234}U other than ^{234}U resulting from ^{238}Pu decay.
r	The listed light element impurities have a combined mass limit of 3080 grams minus the mass of Be and C present.
s	The beryllium is assumed to be physically separated from the plutonium oxide. The 200 grams of beryllium can be in any configuration with up to 275 cm^2 in direct contact with plutonium contents. The surface area restriction is based on shielding.
t	Total impurity limit is based on the minimum 30% Pu + U mass within DOE-STD-3013. The limit was calculated from the maximum radioactive material mass (4.4 kg). [4.4 kg × 70% = 3.08 kg]
u	Plutonium mass is assumed bonded to the tantalum (as an outer/inner reflector) and is not readily separable.
v	For analytical purposes there are no mixing assumptions for the Ta with the radionuclide content.
w	Up to 250 ppm sulfur and 3000 ppm silicon impurities permitted.
x	Not to exceed 1000 grams total ^{232}Th.
y	The ^{240}Pu and the ^{242}Pu mass limits may be adjusted per the equation: $^{242}Pu + 0.596\ ^{240}Pu < 1290$, Where ^{240}Pu and ^{242}Pu are the mass limits in grams.
z	^{236}Pu is not expected to be present in significant amounts
aa	These isotopes may be present as long as their contribution as equivalent ^{233}U in the package combined with the actual ^{233}U content present does not exceed the ^{233}U mass content limit. The "equivalent ^{233}U" mass is given by the equation $^{233}U(eq) = {}^{233}U + {}^{235}U/1.4 + {}^{239}Pu/0.83$ for the three primary fissile isotopes where each isotope name indicates the mass of that isotope. Any ^{234}U present shall be considered ^{233}U for this equation.
bb	Small quantities (< 1 g) of these isotopes may be present as long as the ^{240}Pu mass exceeds the ^{241}Pu mass, their combined mass is less than the ^{239}Pu mass, and these isotopes are treated as ^{239}Pu mass in the determination of $^{233}U(eq)$ mass.
cc	0.0018 grams is the limiting mass of ^{232}U based on the 9975 package shielding. This mass limit increases to 0.0101 gram if the material is shipped in the Shielded-Pig Convenience Container Configuration (Figure 1.8).
dd	This mass value is the minimum subcritical mass limit for ^{233}U (ANSI/ANS-8.1).
ee	When present, nickel is plating used to fix contamination on the welded stainless steel capsule encasing the uranium source material for content envelope C.9

Table 1.3 Summary of Requirements by Content and Configuration

Content Envelope	Configuration			
	3013		Food-Pack Can	Hex-Can or Shielded-Pig
C.4 & C.11	Ref. 3013 outer can Inner and material cans per STD-3013	PCV Atmosphere ≥ 75% (CO_2) 3013 atmosphere maximum 5% O_2 (He or N_2)* inter-can diameter difference < 0.75 inches	PCV sleeve required perforated spacer can used if axial void space maximum 100-g plastic maximum 200-g Al foil maximum 900-g can mass PCV atmosphere ≥ 75% (CO_2) can atmosphere maximum 5% O_2 (He or N_2)* inter-can diameter difference < 0.75 inches	manufactured per drawings listed packing configuration control PCV sleeve required Hex-can maximum 5% O_2 (He or N_2)* PCV atmosphere ≥ 75% (CO_2)
C.1, C.3, C.5 & C.6 &C.10	No organic liners 3013 Top Spacer required	If ≥ 3 kg per inner/material can • sum of container walls < 0.26 inches • sum of tops & bottoms < 1.77 inches • 400 x 400 or bigger • 315 x 402 or bigger	maximum 100-g plastic if ≥ 3 kg per food-pack can • sum of can walls < 0.26 inches • sum of can tops & bottoms < 1.77 inches • 400 x 400 or bigger	NA
C.2	NA	NA	aluminum pellets for packing and heat dissipation	NA
C.7	NA	NA	maximum 200-g Al foil	NA
C.8	NA	NA	maximum 100-g plastic maximum 1000-g can mass SCV, PCV and Food-Pack Can maximum 3% O_2 (Ar)	NA
C.9	NA	NA	If ≤ 0.0018 grams 232U Maximum 100-g plastic Aluminum pellets or foil for packing	If the amount of 232U > 0.0018 grams and 232U ≤ 0.0101 grams or if required by dose measurements, the Shielded-Pig, aluminum convenience can, top and bottom honeycomb spacer are required as shown in Figure 1.8 of the SARP.
All	19 watts maximum radioactive decay heat rate* less than 1000 ppm other radionuclides (unless otherwise stated) PCV bottom spacer required 44.4 lb maximum content weight (radioactive contents, product cans, spacers, etc.)			

* IMPORTANT: Special requirements for low density oxide materials are given in Table 1.4.

Weights and Contents Descriptions

The maximum gross weight of the 9975 package is 404 lb. The maximum payload weight of the 9975 package is 44.4 lb.

The contents are in solid form as metal pieces or oxides; liquid contents are not permitted. The maximum allowable radioactive decay heat rate of the content envelopes other than C.4 and C.11 is limited to 19 watts. For content envelopes C.4 and C.11, the local atmosphere dilution and the decay heat must meet the requirements specified in Table 1.4.

Table 1.4 Requirements for Local Atmosphere Dilution and Decay Heat

C.4 &C.11 Density (g/cm^3)	**Local Atmospheres Inside PCV**		**Maximum Decay Heat** (Watts)
	Inside Content Container	**Outside Content Container**	
2.0 to 19.84	N_2 or Helium dilution to: $\leq$ 5% O_2	$\geq$ 75% CO_2 $\leq$ 25% air	19
1.0 to < 2.0	Helium dilution to: $\leq$ 5% O_2	↓	19
1.0 to < 2.0	N_2 dilution to: $\leq$ 5% O_2	↓	18
< 1.0	Helium dilution to: $\leq$ 5% O_2	↓	18.4
< 1.0	N_2 dilution to: $\leq$ 5% O_2	↓	16.5

Contents Radioactive Constituents

Package contents include actinide metals, oxides, and other compounds in Type B quantities. Package contents can exceed 3,000 A_2, as defined in 10 CFR 71.4; therefore, the package is considered as a Category I package.

1.3 Criticality Safety Index (CSI)

Properly configured Model 9975 packages satisfy the requirements of 10 CFR 71.55 and 71.59 for the surface-only mode of transport. The 9975 package has a calculated Criticality Safety Index (CSI) of 2.0.

1.4 Radiation Level and Transport Index

The TI is to be determined by measurement at the time of transport. The TI must be less than 10 for nonexclusive use shipment per 10 CFR 71.47(a).

1.5 Conclusion

On the basis of the statements and the representations in Chapter 1 of the consolidated 9975 SARP and DOE PCP staff's confirmatory evaluation, DOE PCP finds the general information and drawings presented in Chapter 1 of the consolidated SARP acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

DOE PCP has concluded that the following condition of approval needs to be added to the CoC.

"No design change to the 9975-85 packaging was necessary for compliance to the -96 requirements. Therefore 9975 packages currently labeled as USA/9975/B(M)F-85 meet the performance criteria for a Type B(M)F-96"

Evaluations of design and performance of the package for safety and regulatory compliance in structural, thermal, containment, shielding, criticality safety, operating procedures, acceptance tests and maintenance, and quality assurance are given in the remaining sections of this SER.

2. STRUCTURAL

DOE PCP staff reviewed Chapter 2 of the S-SARP-G-00003, Revision 2, 9975 SARP, and the relevant information documented in the S-SARP-G-00003, Revision 0, 9975 SARP, the WSRC-SA-2002-00008 Revision 0 9975 SARP, and the three addenda (identified as S-SARA-G-00002, Revision 1, S-SARA-G-00007, Revision 1, and S-SARA-G-00008, Revision 0), and finds that Chapter 2 of the SARP[7] is a consolidation of these previously approved documents and that there are no structural-related issues that need to be addressed pursuant to this request of SARP consolidation.

On the basis of the statements and the representations in Chapter 2 of the consolidated 9975 SARP, and DOE PCP staff's confirmatory evaluation, DOE PCP finds the structural design and performance of the 9975 package presented in Chapter 2 of the consolidated SARP acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

3. THERMAL

DOE PCP staff reviewed Chapter 3 of the S-SARP-G-00003, Revision 2, 9975 SARP, and the relevant information documented in the S-SARP-G-00003, Revision 0, 9975 SARP, the WSRC-SA-2002-00008 Revision 0 9975 SARP, and the three addenda (identified as S-SARA-G-00002, Revision 1, S-SARA-G-00007, Revision 1, and S-SARA-G-00008, Revision 0), and finds that Chapter 3 of the SARP[7] is a consolidation of these previously approved documents and that there are no thermal-related issues that need to be addressed pursuant to this request of SARP consolidation.

On the basis of the statements and the representations in Chapter 3 of the consolidated 9975 SARP, and DOE PCP staff's confirmatory evaluation, DOE PCP finds the thermal design and performance of the 9975 package presented in Chapter 3 of the consolidated SARP acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

DOE PCP has concluded that following condition of approval needs to be added to the CoC:

"Except for the content envelopes C.4 and C.11, the maximum allowable decay heat of the contents in the 9975 package shall be limited to 19 W. For the content envelopes C.4 and C.11, the local atmosphere dilution and the allowable decay heat shall meet the requirements specified in Table 3.4 of the SARP and Table 2 in the CoC."

4. CONTAINMENT

DOE PCP staff reviewed Chapter 4 of the S-SARP-G-00003, Revision 2, 9975 SARP, and the relevant information documented in the S-SARP-G-00003, Revision 0, 9975 SARP, the WSRC-SA-2002-00008 Revision 0 9975 SARP, and the three addenda (identified as S-SARA-G-00002, Revision 1, S-SARA-G-00007, Revision 1, and S-SARA-G-00008, Revision 0), and finds that Chapter 4 of the SARP[7] is a consolidation of these previously approved documents and that there are no containment-related issues that need to be addressed pursuant to this request of SARP consolidation.

On the basis of the statements and the representations in Chapter 4 of the consolidated 9975 SARP and DOE PCP staff's confirmatory evaluation, DOE PCP finds the containment design and performance of the 9975 package presented in Chapter 4 of the consolidated SARP acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

5. SHIELDING

DOE PCP staff reviewed Chapter 5 of the S-SARP-G-00003, Revision 2, 9975 SARP, and the relevant information documented in the S-SARP-G-00003, Revision 0, 9975 SARP, the WSRC-SA-2002-00008 Revision 0 9975 SARP, and the three addenda (identified as S-SARA-G-00002, Revision 1, S-SARA-G-00007, Revision 1, and S-SARA-G-00008, Revision 0), and finds that Chapter 5 of the SARP[7] is a consolidation of these previously approved documents and that there are no shielding-related issues that need to be addressed pursuant to this request of SARP consolidation.

On the basis of the statements and the representations in Chapter 5 of the consolidated 9975 SARP, and DOE PCP staff's confirmatory evaluation, DOE PCP finds the shielding design and performance of the 9975 package presented in Chapter 5 of the consolidated SARP acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

6. CRITICALITY

DOE PCP staff reviewed Chapter 6 of the S-SARP-G-00003, Revision 2, 9975 SARP, and the relevant information documented in the S-SARP-G-00003, Revision 0, 9975 SARP, the WSRC-SA-2002-00008 Revision 0 9975 SARP, and the three addenda (identified as S-SARA-G-00002, Revision 1, S-SARA-G-00007, Revision 1, and S-SARA-G-00008, Revision 0), and finds that Chapter 6 of the SARP[7] is a consolidation of these previously approved documents and that there are no criticality-related issues that need to be addressed pursuant to this request of SARP consolidation.

On the basis of the statements and the representations in Chapter 6 of the consolidated 9975 SARP, and DOE PCP staff's confirmatory evaluation, DOE PCP finds the criticality design and performance of the 9975 package presented in Chapter 6 of the consolidated SARP acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

7. PACKAGE OPERATIONS

DOE PCP staff reviewed Chapter 7 of the S-SARP-G-00003, Revision 2, 9975 SARP, and the relevant information documented in the S-SARP-G-00003, Revision 0, 9975 SARP, the WSRC-SA-2002-00008 Revision 0 9975 SARP, and the three addenda (identified as S-SARA-G-00002, Revision 1, S-SARA-G-00007, Revision 1, and S-SARA-G-00008, Revision 0), and finds that Chapter 7 of the SARP[7] is a consolidation of these previously approved documents and that there are no operations-related issues that need to be addressed pursuant to this request of SARP consolidation.

On the basis of the statements and the representations in Chapter 7 of the consolidated 9975 SARP, and DOE PCP staff's confirmatory evaluation, DOE PCP finds the operating procedure requirements presented in Chapter 7 of the consolidated SARP acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

8. ACCEPTANCE TESTS AND MAINTENANCE PROGRAM

DOE PCP staff reviewed Chapter 8 of the S-SARP-G-00003, Revision 2, 9975 SARP, and the relevant information documented in the S-SARP-G-00003, Revision 0, 9975 SARP, the WSRC-SA-2002-00008 Revision 0 9975 SARP, and the three addenda (identified as S-SARA-G-00002, Revision 1, S-SARA-G-00007, Revision 1, and S-SARA-G-00008, Revision 0), and finds that Chapter 8 of the SARP[7] is a consolidation of these previously approved documents and that there are no acceptance tests and maintenance program-related issues that need to be addressed pursuant to this request of SARP consolidation.

On the basis of the statements and the representations in Chapter 8 of the consolidated 9975 SARP, and DOE PCP staff's confirmatory evaluation, DOE PCP finds the acceptance tests and maintenance program presented in Chapter 8 of the consolidated SARP acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

DOE PCP has concluded that following condition of approval needs to be added to the CoC:

"9975-85 packaging used for transportation shall be converted to 9975-96 packaging following the requirements of Drawing R-R2-F-0025 in Appendix 1.1, and the procedures of Chapter 7 of the SARP by June 30, 2015. 9975-85 packaging that are taken out of storage and that will be used for transport in commerce after June 30, 2015, must be converted to 9975-96 packaging following the procedures of Chapter 7, and annual maintenance per Section 8.2 should be performed after remarking the package, before continuing with Section 7.2.1, Preparation for Loading."

9. QUALITY ASSURANCE

DOE PCP staff reviewed Chapter 9 of the S-SARP-G-00003, Revision 2, 9975 SARP, and the relevant information documented in the S-SARP-G-00003, Revision 0, 9975 SARP, the WSRC-SA-2002-00008 Revision 0 9975 SARP, and the three addenda (identified as S-SARA-G-00002, Revision 1, S-SARA-G-00007, Revision 1, and S-SARA-G-00008, Revision 0), and finds that Chapter 9 of the SARP[7] is a consolidation of these previously approved documents and that there are no quality assurance-related issues that need to be addressed pursuant to this request of SARP consolidation.

On the basis of the statements and the representations in Chapter 9 of the consolidated 9975 SARP, and DOE PCP staff's confirmatory evaluation, DOE PCP finds that the QA requirements identified in Chapter 9 of the SARP establish QA requirements for the packaging. Information provided in Chapter 9 is acceptable and will provide reasonable assurance that the regulatory requirements in 10 CFR 71 have been met.

DOE PCP has concluded that following condition of approval needs to be added to the CoC:

"All commercial-grade dedication shall be approved by the design authority."