

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

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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 (*Name and Address*)
General Atomics
3550 General Atomics Court
San Diego, CA 92121
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
Public Service Company of Colorado
application dated March 28, 1996, as supplemented

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. : FSV-1 Unit 3
- (2) Description

The FSV-1 Unit 3 is a stainless steel-encased, depleted uranium-shielded cask. The cask body is a cylinder 208-inches long and 28-inches in diameter, except for the top flange area, which is 31-inches in diameter. The cavity is approximately 17.7-inches in diameter and 187.6-inches long.

The cask may be used in one of seven configurations (A through G) depending on contents. Configurations A, B, C, and D are used to ship solid, non-fissile irradiated hardware. These configurations use an outer lid consisting of a 3.75-inch thick stainless steel plate and a 2.25-inch thick depleted uranium shield. The lid is bolted to the cask body by 24 1.25-inch diameter fasteners. The primary seal is a silicone elastomeric seal ring between the outer lid and cask body. Configuration B does not require an inner container. Configuration C uses a supplemental stainless steel shield ring and cover plate. Configuration D uses a supplemental carbon steel shield ring and cover plate.

Configuration E is used to ship Fort St. Vrain (FSV) high temperature gas reactor (HTGR) fuel elements. This configuration uses the stainless steel inner container (as shown in General Atomic Drawing Nos. GADR 55-2-1, Rev. C, and GADR 55-2-2, Rev. A) as the containment vessel. The inner container lid is a stainless steel shell containing depleted uranium 4.15-inches thick. The inner lid is secured to the inner container body by 12 0.5-inch diameter fasteners. The primary seal is a silicone elastomeric seal ring between the inner lid and inner container body. Configuration E is equipped with an impact limiter on the upper end.

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Configuration F and G are used to ship solid non-fissile irradiated and contaminated hardware from the FSV HGTR. These configurations use a 4.75-inch thick steel outer lid. The lid is secured to the cask body by 24 1.25-inch diameter fasteners. The primary seal is a molded silicone elastomeric seal ring between the outer lid and the cask body. Configurations F and G both use an impact limiter on the upper end. Configurations F and G also use a burial canister with a 12-inch thick carbon steel plug. The shielded spacer in the burial canister is used only in Configuration G.

The overall weight for the FSV-1 Unit 3 package is 46,025 pounds for Configurations A, B, C, and D and 47,600 pounds for Configurations E, F, and G.

(3) Drawings

The FSV-1 Unit 3 package is constructed in accordance with the following drawings:

Configuration A

National Lead Company Drawing Nos. : 70086F, Rev. 7; 70296F, Rev. 2; and General Atomics Drawing No. 1501-003, Rev. C

Configuration B

Same as for Configuration A except that an inner container is not required.

Configuration C and D

In addition to the drawings for Configuration A, General Atomics Drawing Nos. GADR 55-2-10, Issue D, and GADR 55-2-14, Issue N/C (optional). Configuration C uses a supplemental stainless steel shield ring and cover plate constructed in accordance with Drawing No. GADR 55-2-11, Issue B. Configuration D uses a supplemental carbon steel shield ring and cover plate constructed in accordance with Drawing No. GADR 55-2-11, Issue A.

Configuration E

In addition to the drawings for Configuration A, General Atomics Drawings Nos. GADR 55-2-1, Issue C; GADR 55-2-2, Issue A; and GADR 55-2-3, Issue B.

Configuration F and G

In addition to the drawings for Configuration A, General Atomic Drawings Nos. GADR 55-2-1, Issue C; GADR 55-2-2, Issue A; GADR 55-2-12, Issue C; and GADR 55-2-13, Issue A.

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5. (b) Contents

(1) Type and form of material

- (i) Irradiated fuel elements consisting of graphite body, hexagonal in horizontal cross section, approximately 31.2-inches high and 14.2-inches across the flats. Prior to irradiation, each fuel element contains thorium and uranium enriched to a maximum of 93.5 w/o in the U-235 isotope, or
- (ii) Solid, irradiated, and contaminated hardware, which may include fissile material, provided the quantity of fissile material does not exceed a Type A quantity and does not exceed the mass limits of 10 CFR 71.53 until October 1, 2004, and 10 CFR 71.15, thereafter and neutron source components, or
- (iii) Solid, nonfissile, irradiated and contaminated hardware which has been removed from the Fort St. Vrain High Temperature Gas Cooled Reactor and the surface contamination does not exceed 51 millicuries per package.

(2) Maximum quantity of material per package

Decay heat not to exceed 4.1 kw and:

(i) Item 5(b)(1)(i) above:

Six fuel elements each containing a maximum of 1.4 kg of enriched uranium, having a thorium/uranium ratio greater than 8.1:1 and weighing approximately 300 pounds. The gross weight of the cask cavity contents, including the component spacers, inner container, and irradiated fuel elements shall not exceed 4,430 pounds. Contents must be shipped in Configuration E.

(ii) Item 5(b)(1)(ii) above:

The gross weight of the cask cavity contents, including appropriate component spacers, liners, inner containers, shield rings and solid, non-fissile, irradiated and contaminated hardware shall not exceed 3,720 pounds. Contents must be shipped in Configurations A, B, C, or D.

(iii) Item 5(b)(1)(iii) above:

The gross weight of all of the cask cavity contents, including burial canister and spacers, with or without supplemental shielding shall not exceed 4,430 pounds. Contents must be shipped in Configurations F or G.

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5. (c) Criticality Safety Index

(Minimum transport index to be shown on
label for nuclear criticality control)

100

6. As needed, appropriate component spacers must be used in the cask cavity when shipping the contents described in paragraph 5(b) to limit movement of contents during shipment.
7. For transport of the contents of Item 5(b)(1)(ii) in Configuration D, the dose rate measured on the surface of the package must not exceed 200 mr/hr. For the purpose of this requirement, the surface of any personnel barrier may not be considered the surface of the package.
8. The Model No. FSV-1 Unit 3 cask may be wrapped with reinforced plastic when shipping the contents described in Item 5(b)(1)(ii) or (iii) provided the heat generation rate does not exceed 500 watts. The applicable requirements of 10 CFR 71.87 must be satisfied prior to wrapping the cask.
9. Use of packaging fabricated after August 31, 1986, is not authorized.
10. In addition to the requirements of Subpart G of 10 CFR Part 71:
 - (a) Configurations A, B, C, and D of the Model FSV-1 Unit 3 shipping cask shall be prepared for shipment and operated in accordance with the Operating Procedures of Section 7.0, Volume I, of the application, as supplemented. The package shall be maintained in accordance with the Maintenance Program in Section 8.0, Volume I, of the application, as supplemented.
 - (b) Configurations E, F, and G of the Model FSV-1 Unit 3 shipping cask shall be prepared for shipment and operated in accordance with the Operating Procedures of Section 7.0, Volume II, of the application, as supplemented. The packages shall be maintained in accordance with the Maintenance Program in Section 8.0, Volume II, of the application, as supplemented.
 - (c) The main flange seals must be replaced within twelve (12) months prior to any use of the packaging and must be replaced if inspection shows any defect.
 - (d) The silicone O-ring on the inner container primary plug in Configuration E must be replaced within the twelve (12) months prior to any use of the packaging and must be replaced if inspection shows any defect.
11. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
12. Revision 2 of this certificate may be used until May 31, 2007.
13. Expiration date: October 1, 2008. This certificate is not renewable.

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REFERENCE

Public Service Company of Colorado application dated March 28, 1996, as supplemented by Chem-Nuclear Systems, L.L.C., letter dated May 19, 1997, and General Atomics letter dated June 6, 1997, as supplemented April 11, 2001, June 7, 2001, and May 5, 2006

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Robert A. Nelson, Chief
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Date: 5/31/06



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT

Docket No. 71-9277
Model No. FSV-1 Unit 3 Package
Certificate of Compliance No. 9277
Revision No. 3

SUMMARY

By application dated May 5, 2006, General Atomics (GA) requested renewal of Certificate of Compliance (CoC) No. 9277 for the Model No. FSV-1 Unit 3 package. GA did not request any changes to the package design or authorized contents. The certificate has been renewed for a term ending October 1, 2008.

EVALUATION

By application dated May 5, 2006, GA requested renewal of Certificate of Compliance No. 9277. The staff reviewed the documents referenced in the certificate and determined that the documentation was available and complete. The staff also reviewed the operating and maintenance procedures for any impacts due to the proposed changes and determined that there are no affects from the proposed modifications.

The Certificate of Compliance No. 9277 has been renewed until October 1, 2008. This is less than the standard 5-year renewal interval because the safety series under which this CoC was originally approved will no longer be valid. This is due to the requirement of the most recent revision of 10 CFR Part 71, updated October 2004 (69 FR 3698) that does not authorize renewal for packages approved under the 1967 safety series past October 1, 2008.

The following changes have been made to the Certificate of Compliance:

- Condition No. 11 was revised to reflect the new numbering due to the new Part 71 ruling effective October 1, 2004 (69 FR 3698).
- Condition No. 12 was added to authorize the use of the previous revision of the certificate for a period of approximately one year.
- Condition No. 13 was updated for the new expiration date of October 1, 2008. This certificate is not renewable.

CONCLUSION

The certificate has been renewed for a term that expires on October 1, 2008. This change does not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9277, Revision 3
on May 31, 2006.