

POOR ORIGINAL

Form NRC-618  
(12-73)  
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION  
CERTIFICATE OF COMPLIANCE  
For Radioactive Materials Packages

1.(a) Certificate Number 9044	1.(b) Revision No. 6	1.(c) Package Identification No. USA/9044/B( )F	1.(d) Pages No. 1	1.(e) Total No. Pages 4
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2. PREAMBLE

- 2.(a) This certificate is issued to satisfy Sections 173.393a, 173.394, 173.395, and 173.396 of the Department of Transportation Hazardous Materials Regulations (49 CFR 170-189 and 14 CFR 103) and Sections 146-19-10a and 146-19-100 of the Department of Transportation Dangerous Cargoes Regulations (46 CFR 146-149), as amended.
- 2.(b) The packaging and contents described in item 5 below, meets the safety standards set forth in Subpart C of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Materials for Transport and Transportation of Radioactive Material Under Certain Conditions."
- 2.(c) 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—

3.(a) Prepared by (Name and address): General Electric Company P. O. Box 460 Pleasanton, CA 94566	3.(b) Title and identification of report or application: General Electric Company application dated January 8, 1969, as supplemented.
	3.(c) Docket No. 71-9044

4. CONDITIONS

This certificate is conditional upon the fulfilling of the requirements of Subpart D of 10 CFR 71, as applicable, and the conditions specified in item 5 below.

5. Description of Packaging and Authorized Contents, Model Number, Fissile Class, Other Conditions, and References:

(a) Packaging

(1) Model No.: GE-1600

(2) Description

Steel encased lead shielded shipping cask. A double-walled steel cylinder protective jacket encloses the cask during transport. It is bolted to a steel pallet. The cask is closed by a lead-filled flanged plug fitted with a silicone rubber gasket and bolted closure. The cavity is equipped with a drain line and the physical description is as follows:

Cask height, in	67.5
Cask diameter, in	38.5
Cavity height, in	54.0
Cavity diameter, in	26.5
Lead shielding, in	5.0
Protective jacket height, in	81.4
Protective jacket width, in	68.0
Packaging weight, lbs	23,050

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5. (a) Packaging (continued)

(3) Drawings

The packaging is constructed in accordance with the following General Electric Company Drawing Nos.:

212E255, Rev. 3	135C5598, Rev. 1
106D3986, Rev. 1	106D3973, Rev. 1
174F237, Rev. 1	

(b) Contents

(1) Type, form and maximum quantity of material per package

Plutonium in excess of twenty (20) curies per package must be in the form of metal, metal alloy or reactor fuel elements; and

(i) Byproduct material and special nuclear material as solid metal or oxides. Decay heat not to exceed 600 watts. The radioactive material shall be in the form of fuel rods, or plates, fuel assemblies, or meeting special form requirements of 10 CFR §71.4(o).

500 gm U-235 equivalent mass; or

(ii) Neutron sources in special form.

500 gm U-235 equivalent mass. Decay heat not to exceed 50 watts; or

(iii) Irradiated  $\text{PuO}_2$  and  $\text{UO}_2$  fuel rods clad in zircaloy or stainless steel. Decay heat not to exceed 600 watts. All fuel rods shall be contained within a closed 5-inch Schedule 40 pipe with a maximum useable length of 39-5/8 inches.

1,200 gm fissile material with no more than 300 gm fissile material per 5-inch Schedule 40 pipe.

(iv) Irradiated UC and ThC fuel particles clad in graphite and contained within a standard HTGR hexagonal cross-section graphite block. Decay heat not to exceed 600 watts. Each graphite block shall be contained within a sealed cylindrical inner container constructed in accordance with General Atomic Company Drawing No. 021583, Issue A, with three, 1/2-inch by 4-1/2-inch radial fins to provide centering within the cavity.

1,400 grams U-235 equivalent mass in each inner container with no more than one inner container per package.

(v) Process solids, either dewatered, solid, or solidified in a secondary sealed container meeting the requirements for low specific activity radioactive material.

5. (b) (1) Contents (continued)

(vi) Solid nonfissile irradiated metal hardware, reactor control rods (blades), and reactor start-up sources.

(c) Fissile Class

III

Maximum number of packages per shipment

(i) Contents 5.(b)(1)(i), 5.(b)(1)(ii), or 5.(b)(1)(iii):

Two (2); or

(ii) Contents 5.(b)(1)(iv):

One (1)

6. The U-235 equivalent mass is determined by U-235 mass plus 1.66 times U-233 mass plus 1.66 times Pu mass.
7. For packaging of neutron sources, the cavity drain line shall be closed with a plug with a melting temperature of 200°F and the cask cavity shall be filled with water with a 5-inch air space within the cask cavity. When needed, sufficient antifreeze in the cask shall be used to prevent damage to any component of the package due to freezing.
8. For packaging of other than neutron sources, the cask shall be delivered to a carrier dry and the cavity drain line shall be closed with a plug which will maintain its seal at temperatures up to at least 620°F.
9. Shoring shall be provided to minimize movement of contents during accident conditions of transport.
10. Prior to each shipment the silicone rubber lid gasket(s) shall be inspected. This gasket(s) shall be replaced if inspection shows any defects or every twelve (12) months, whichever occurs first. Cavity drain line shall be sealed with appropriate sealant applied to threads of pipe plug.
11. For packaging of neutron sources, measurements shall be made to determine that the dose rate does not exceed 1,000 mrem/hr at 3 feet from the surface of a dry cask with no additional shielding within the cask.
12. The contents described in 5.(b)(1)(v) shall be transported on a motor vehicle, railroad car, aircraft, inland water crafts, or hold or deck of a seagoing vessel assigned for sole use of the licensee.
13. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12(b).
14. Expiration date: December 31, 1980.


REFERENCES

General Electric application dated January 8, 1969.

Supplements dated: February 12, 20, and 27, and March 10 and 24, 1969; November 20, 1970; January 29 and March 12, 1971; July 3 and November 15, 1973; and August 26, 1980.

Nuclear Plant Services supplement dated: July 7, 1975.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

  
Charles E. MacDonald, Chief  
Transportation Certification Branch  
Division of Fuel Cycle and  
Materials Safety

Date: OCT 08 1980