

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

1.(a) Certificate Number 9009	1.(b) Revision No. 5	1.(c) Package Identification No. USA/9009/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 780 Wilmington, North Carolina 28401	3.(b) Title and identification of report or application: General Electric Company application dated March 12, 1973, as supplemented.
3.(c) Docket No 71-9009	

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.: FL 10-1

(2) Description

Two 16-gage 55-gallon drums welded end to end, approximately 68 inches long and 22-1/2 inches in diameter. The outer drum closure shall be accomplished by at least a 12-gage bolt-locking ring with drop-forged lugs, one of which is threaded to receive at least 5/8-inch diameter bolt and lock nut. The pressure vessel support mechanism consists of wood supports, steel inner sleeve and nut ring to receive the containment vessel, and fire resistant phenolic foam, formed in place in accordance with AEC Materials and Equipment Specification SP-9 to an average finished density of at least 8 pounds per cubic foot for the main body and 10 pounds per cubic foot for the cap. Gas relief holes shall be provided in the outer steel drum.

The containment vessel is a 304L stainless steel 5-inch schedule 40 pipe, approximately 53-1/2 inches long, with a 304L stainless steel 1/2-inch thick welded bottom plate and a 304L stainless steel 300 pound slipon flange and blind flange which is fastened by eight 3/4-inch steel bolts. The flange closure is gasketed by two fluoroelastomer O-rings with a pressure tap between the two O-rings grooves. During shipment, the O-ring groove pressure tap

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5.(a)(2) Description (continued)

is sealed with a pipe plug with threads wrapped in teflon tape. A 1/4-inch stainless steel valve is screwed into the blind flange of the containment vessel. The valve is sealed by a pipe cap (threads wrapped with teflon tape) and is protected by a 2-1/2-inch high section 5-inch Schedule 40 pipe welded to the top of the flange. The packaging has a maximum gross weight of 515 lbs.

(3) Drawings

The FL 10-1 package is described by International Nuclear Company (INCO) Drawing No. DSD-479-D, Rev. C, and the containment vessel described by INCO Drawing No. DSD-480-D, Rev. C. The containment vessel seal is described by INCO Drawing No. DED-169-B, Rev. 2.

(b) Contents

(1) Type and form of material

- (i) Uranyl nitrate solutions having a concentration of uranium 235 and uranium 233 not exceeding 350 grams per liter and an H/U-235 atomic ratio not less than 80, provided that the U-233 and plutonium content is not more than 1% of the U-235 content; or
- (ii) Uranyl nitrate solutions having a combined concentration of uranium 233 and uranium 235 not exceeding 250 grams per liter and an H to fissile material atomic ratio not less than 80 provided (1) the U-233 content is not greater than 20% of the combined U-233 and U-235 content, and (2) the plutonium content is not more than 1% of the combined U-233 or U-235 content; or
- (iii) Plutonium nitrate solutions having a concentration not exceeding 250 grams fissile plutonium per liter; or
- (iv) Uranyl sulfate solution (UO_2SO_4) containing uranium-235; or
- (v) Dry compounds and mixtures of fissile plutonium-uranium-235.

(2) 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 elements; or must be in accordance with Item 9 below; and:

- (i) For the contents described in 5(b)(1)(i), (ii), and (iii):

Maximum decay heat load not to exceed 21 watts, and 10.5 liters of solution.

5.(b) Contents (continued)

(ii) For the contents described in 5(b)(1)(iv):

Maximum decay heat load not to exceed 18 watts and 950 grams fissile material.

(iii) For the contents described in 5(b)(1)(v):

Maximum decay heat load not to exceed 30 watts, and 4.5 kilograms fissile material.

(c) Fissile Class

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6. The solution contents of the package shall be contained with a bottle having one of the following specifications:

(i) Slit vent polyethylene bottle per CAPE-1170-37,

(ii) Duo-vent polyethylene bottle per Nuclear Fuel Services, Inc., Specification U-1 and Drawing No. 5B-U-740, or

(iii) Stainless steel bottle as shown on General Electric Company Drawings Nos. FRO-140 and FRO-140A.

7. The polyethylene bottles may be packaged within the metal inner container described by Chester-Jensen Company, Inc., Drawings Nos. 1092M-1, 1093M-1, 1095M-1 and 1096M-1, Issue 1, dated April 26, 1971.

8. The packaging for the polyethylene bottles shall include a flexible restraining device (such as recommended in ARH-1819 "Vibration Testing of L-3 and L-10 Shipping Containers") placed between the cap assembly of the polyethylene bottle and the closure flange of the pressure vessel to assure that the polyethylene bottle will vibrate at the same frequency as the pressure vessel during transport.

9. Dry compounds and mixtures which shall be packaged within sealed metal cans or DOT specification 2R containers (49 CFR §178.34); and placed within an inner container constructed and leak tested as specified on General Electric Illustration AFL 1105. Following the gas leak testing specified on the Illustration, all inner container welds shall be leak tested using a liquid penetrant method in accordance with Article 6, Section V, ASME Code. Alternatively, the inner container shown in the Illustration may be constructed of 300 series stainless steel pipe with an outside diameter of 4.500 inches with a 0.120 inch wall thickness.

10. Appropriate steps shall be taken to assure that from the time of sealing to the time of delivery to the consignee, the pressure in the containment vessel will not exceed 40 psig.

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11. Prior to each shipment of more than Type A quantities of radioactive material, the space between the double O-ring seal shall be tested at 100 psig and leak detection performed by a method capable of detecting a leak greater than 10^{-3} atm cc/sec at standard temperature and pressure. No package with a detectable leak shall be delivered to a carrier for transport.
12. In addition to the requirements of subpart D of 10 CFR 71, a test shall be performed on each containment vessel and associated 1/4-inch SS valve (without its associated pipe cap) initially and once each year at 300 psig and the leak detection performed by a method capable of detecting a leak greater than 10^{-6} atm cc/sec at standard temperature and pressure. Any chamber that fails to pass the test shall be withdrawn from service and repaired to meet the test.
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: August 31, 1983.

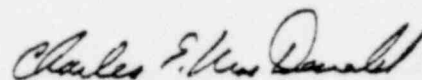
REFERENCES

General Electric Company application dated March 12, 1973.

Supplements dated: April 13, 1973; March 21, 1974; and April 16, 1979.

Westinghouse Electric Corporation letter dated October 3, 1979.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



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

Date: JAN 30 1980

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