

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

1.(a) Certificate Number	1.(b) Revision No.	1.(c) Package Identification No.	1.(d) Pages No.	1.(e) Total No. Pages
9016	2	USA/9016/B( )F	1	4

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):	3.(b) Title and identification of report or application:
Transnuclear, Inc. One North Broadway White Plains, NY 10601	Transnuclear, Inc. application dated April 9, 1980.
	3.(c) Docket No. 71-9016

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.: TN-9
- (2) Description

A lead, steel resin shielded irradiated fuel shipping cask. The cask approximates a right circular cylinder 1,718 mm in diameter and 5,756 mm long. The cavity consists of three rectangular, stainless steel pressure vessels welded to end plates and a circular stepped top flange and separated by thin cooper plates. The bays are divided into a total of seven (7) square compartments, 150 x 150 mm and 4,520 mm long. The main shielding consists of 128 mm of lead, 26 mm of steel and 150 mm of resin. A wet cement layer is located between the lead and the outer shell. Radial copper cooling fins are welded to the outer shell and cover the surface of the cask between each end drum.

The lid is a welded stainless steel shell containing lead and resin shields. The pressure vessel is closed and sealed by sixteen (16), 1-1/4-inch diameter bolts and two silicone rubber or Viton O-rings located within recessed grooves on the top flange. Each extremity of the cask is surrounded by circular stainless steel drums reinforced by radial gusset plates and filled with balsa wood. A disk shaped impact limiter, constructed of carbon steel and balsa wood, is fastened to each drum with four (4), 1-1/4-inch bolts. The vent and drain lines which penetrate the inner cavity are equipped with positive closures. In addition, all access ports are protected by the impact limiters.

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5. (a) Packaging (Continued)

(2) Description (Continued)

Trunnions are used for lifting and tie-down of the package. The cask weighs approximately 36,000 kg.

(3) Drawings

The package is constructed in accordance with Transnuclear Drawing No. 9317.03, Rev. J. The materials of construction and welds shall be in accordance with Annex A, B, and C to Chapter II of the Application.

(b) Contents

(1) Type and form of material

Irradiated BWR uranium oxide fuel assemblies of the following specifications:

Fuel form	Clad UO <sub>2</sub> Pellets
Cladding material	Zr <sup>2</sup> or SS
Initial fuel pin pressure at 100°F, psig	200
Maximum initial U content/assembly, kg	201
Maximum average initial U-235 enrichment, w/o	2.65
Maximum bundle cross section, inches	5.52
Maximum active fuel length, inches	144
Average burnup, MWD/MTU	36,500
Minimum cooling time, days	150
Maximum weight/fuel assembly, kg	300

(2) Maximum quantity of material per package

Seven (7) BWR assemblies. The maximum decay heat load per package is not to exceed 24.4 kilowatts and 3.5 kilowatts per assembly.

(c) Fissile Class

III

Maximum number of packages per shipment

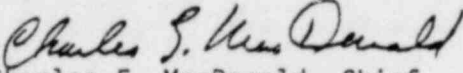
One (1)

6. The cask cavity shall be dry (no free water) when delivered to a carrier for transport. Residual moisture shall be removed from the cask cavity by the methods described in Annex I to Chapter VIII of the Application.
7. Prior to each shipment, the package shall meet the tests and criteria specified for each shipment (operation) in Chapter VIII of the Application.
8. The air coolant is considered as part of the package contents. The radioactive limits specified in 10 CFR §71.35(a)(4) do not apply.
9. The package contents shall be so limited that under normal conditions of transport, the total dose rates shall not exceed 14 mrem/hr at 3 feet from the surface of the package.
10. Any system used for cooling down the package shall be provided with a pressure relief device set so that the maximum pressure in the containment vessel cannot exceed 7 atmospheres during the cool-down process.
11. The systems and components of each packaging shall meet the periodic tests and criteria specified in Chapter VIII of the Application. Each packaging that fails to meet these criteria shall be withdrawn from service until corrective action has been completed.
12. Repair and maintenance of the packaging shall be as described in Chapter VIII of the application.
13. All valves, fittings, seals and relief devices shall be of the type, size, model and manufacture as indicated on the design drawings. The resin material shall be of the specifications stated in Annex A to Chapter II of the Application.
14. Prior to first use, each packaging shall meet the acceptance tests and criteria specified in Chapter VIII of the Application.
15. In accordance with Annex L to Chapter VIII, at periodic intervals not to exceed two (2) years, the thermal performance of the cask shall be analyzed to verify that the cask operation has not degraded below that which is licensed. Following the initial acceptance tests, the heat source may be that provided by the decay heat from the loading of the package, provided that the heat source may be that provided by the decay heat from the loading of the package, provided that the heat source is equal to at least 25% of the design heat load for the package. Each cask that fails to meet the thermal acceptance criteria given in Annex L of the Application shall be withdrawn from service until corrective action can be completed or the license amended to limit the package to lower heat load.
16. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12(b).
17. Expiration date: June 30, 1985.

REFERENCE

Transnuclear, Inc. application dated April 9, 1980.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

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

Date: JUN 18 1980