

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

1.(a) Certificate Number 9781	1.(b) Revision No. 2	1.(c) Package Identification No. USA/9781/B()F	1.(d) Pages No. 1	1.(e) Total No. Pages 3
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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):
U.S. Department of Energy
Division of Naval Reactors
Washington, D.C. 20545

3.(b) Title and identification of report or application:
Safety Analysis Report for M-160 Shipping
Container dated October 18, 1968, as
supplemented.

3.(c) Docket No. 71-9781

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.: M-160

(2) Description

The packaging consists of a containment vessel which is a right circular cylinder, 79 inches in diameter by 199 inches overall height, which holds the spent fuel blankets or assemblies during shipment. The container outer shell consists of 84 evenly spaced vertical fins 151-1/2 inches long, attached to a 1-1/2-inch thick wall (fabricated from carbon steel and clad with stainless steel on the outer surface). The inner shell, the containment vessel, is 1 inch thick (having a 1/8 inch thick rollbonded stainless steel cladding) whose base is 7 inches thick. The 9-7/16-inch annulus between the outer and inner shells is filled with lead. The top of the container is covered with a rotatable closure head fabricated of stainless steel 15 inches thick which is bolted to the container and seals the containment vessel. An oblong access plug in the cover allows for individual spent fuel cell loading or unloading.

The containment vessel has an inside diameter of 55 inches. The central region contains a secondary heat exchanger which is supported by the closure head. (This heat exchanger is not used during shipment.) An inner backup cylinder, 21 inches in diameter, occupies the central region of the containment vessel. The annulus between the backup cylinder and the inner shell of the containment vessel provides a

5. (a) Packaging (continued)

(2) Description (continued)

space 17 inches wide by 160 inches high for spent fuel. The spent fuel is contained in the annulus by aluminum module holders designed for the particular spent fuel to be shipped.

The container has external penetrations to the containment vessel for a steam and water vent line, which is capped during shipment. Shipments are by rail. The container is cradled in a support which permits the container to be nearly horizontal during shipment. The maximum loaded shipping weight is 237,000 pounds.

(3) Drawings

The packaging is constructed in accordance with the description and Drawings Nos. contained in the Bettis Atomic Power Laboratory Safety Analysis Reports (WAPD-OP(R)C-243, WAPD-OP(R)C-558 and WAPD-OP(R)C-621 dated May 1973, October 1, 1976 and March 1977.

(b) Contents

(1) Type and form of material

Irradiated fuel assemblies and blanket modules of the following type

- (i) PWR Core 2 Seed 1 Fuel Assembly.
- (ii) PWR Core 2 Seed 2 Fuel Assembly.
- (iii) PWR Core 2 Blanket Fuel Assembly.
- (iv) S5G Fuel Module, rodded or unrodded.
- (v) S5G Center Cell.

All shipments shall be made dry and shall use one holddown device per PWR module. Each PWR Core 2 Seed 1 or Seed 2 fuel assembly shall contain a poison rod or a control rod.

(2) Maximum quantity of material per package

- (i) 12 fuel assemblies as described in 5(b)(1)(i) or 11 fuel assemblies and one specific blanket fuel assembly, Serial No. G2A-W01-67. Shipment shall not be made prior to 1614 days after last power operation of the fuel and shall not exceed 12,846 Btu/hr of decay heat per shipment.
- (ii) 12 fuel assemblies as described in 5(b)(1)(ii) which shall not exceed 1100 Btu/hr per fuel assembly of decay heat or 13,200 Btu/hr per shipment.
- (iii) 12 blanket fuel assemblies as described in 5(b)(1)(iii) which shall not exceed 21,300 Btu/hr of decay heat per shipment. Shipment shall not be made prior to 1123 days after last power operation of the fuel.

(b) Contents (continued)

(2) Maximum quantity of material per package (continued)

- (iv) 8 fuel assemblies as described in 5(b)(1)(ii) and 4 specific blanket fuel assemblies, Serial Numbers G2A-F01-26B, G2A-F01-02, G2A-F01-10 and G2A-W01-73, which shall not exceed 12,016 Btu/hr of decay heat per shipment. Shipment shall not be made prior to 1487 days after last power operation of the fuel, with the four blanket fuel assemblies located adjacent to each other in a clockwise or counter-clockwise direction as specified by the serial numbers previously stated.
- (v) 4 fuel assemblies as described in 5(b)(1)(iv) or 3 fuel assemblies and one center cell as described in 5(b)(1)(v). Shipment shall not be made prior to 168 days after last power operation of the fuel rod and shall not exceed 12,800 Btu/hr of decay heat per shipment.

(c) Fissile Class

III

Maximum number of packages per shipment

One (1)

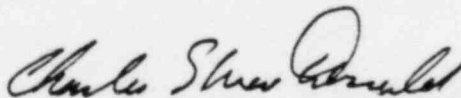
6. Expiration date: January 31, 1988.

REFERENCES

Safety Analysis Report for M-160 Shipping Container: Core Independent Analyses, SRSD-106, dated October 18, 1968, as transmitted by Naval Reactors Letter G#2097, dated June 3, 1969.

Supplements: Knolls Atomic Power Laboratory letter ONP-74520-414, dated November 26, 1969; Naval Reactors letter G#3742, dated May 15, 1973; Bettis Atomic Power Laboratory letters WAPD-OP(R)C-284, dated August 23, 1973 and WAPD-OP(R)C-297, dated October 8, 1973; Naval Reactor letters G#5582, dated December 17, 1976; G#5671, dated April 15, 1977; G#5702, dated May 23, 1977; G#5792, dated September 22, 1977; G#5793, dated September 29, 1977; G#5872, dated December 20, 1977; G#5897, dated January 11, 1978, and G#6658, dated April 14, 1980.

FOR THE NUCLEAR REGULATORY COMMISSION

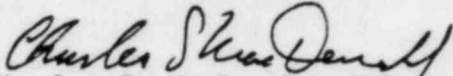

Charles E. MacDonald, Chief
Transportation Certification Branch
Division of Fuel Cycle and
Material Safety

Date: DEC 22 1982

U.S. Nuclear Regulatory Commission
Transportation Certification Branch
Approval Record
Model No. M-160 Packaging
Docket No. 71-9781

By application dated July 27, 1982, U.S. Department of Energy requested renewal of Certificate of Compliance No. 9781. No changes have been authorized to the package design since approval of latest supplement dated April 14, 1980.

The staff concludes that the statements of the original application, as supplemented, satisfies the requirement for renewal of the Certificate of Compliance.


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

Date: DEC 22 1982