NRC FORM 618 (9-83) 10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIALS PACKAGES

1.a CERTIFICATE NUMBER	b. REVISION NUMBER	c. PACKAGE IDENTIFICATION NUMBER	d. PAGE NUMBER	e. TOTAL NUMBER PAGES
5641	11	USA/5641/AF	1	3

2. PREAMBLE

a. This certificate is issued to certify that the 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)

United Nuclear Corporation
67 Sandy Desert Road
Uncasville, CT 06382

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

United Nuclear Corporation application dated February 1, 1982, as supplemented.

c. DOCKET NUMBER 71-5641

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.: UNC-2500

(2) Description

Specific packaging is not required. Safety of shipment is independent of packaging.

(b) Contents

(1) Type and form of material

Unirradiated fuel clusters, modules or other assemblies.

(2) Maximum quantity of material per shipment as Fissile Class III

Not to exceed a Type A quantity of radioactive material; and

Dry Shipment

[Interspersed hydrogenous material limited to an H to U-235 atomic ratio of three (3) or less.]

Shipment limited to:

(i) The stated dry safe quantities (without reference to notes or supplements), but excluding those parts named as "elements" as listed in the following pages of Table 10.0-I to SNM License No. 368:

5. (b) Contents (continued)

P.10.0-4, dated June 4, 1976
P.10.0-5, dated June 4, 1976
P.10.0-6, dated June 4, 1976
P.10.0-7, dated June 4, 1976
P.10.0-7A, dated September 28, 1978
P.10.0-7B, dated May 6, 1985
P.10.0-7D, dated October 27, 1982*
P.10.0-7E, dated December 23, 1988**; or

*Except that Item 6d on page 10.0-7D shall be limited to two clusters.

**With the following exceptions:

Item 7f on page 10.0-7E must contain a poison insert, as described in supplement dated October 19, 1990, which is fabricated and installed in accordance with Figures C-1, C-2, and C-3, of supplement dated October 19, 1990.

Item 7d on page 10.0-7E shall be limited to 7 parts per shipment, for parts identified as Type W and Type C, as described in supplement dated July 25, 1990.

Item 7d on page 10.0-7E shall be limited to 14 parts per shipment, for parts identified as Type W and Type C, as described in supplement dated July 25, 1990, provided the parts are individually wrapped in 1-inch thick polyethylene, in accordance with Figure B-1, of supplement dated August 31, 1990.

Item 7c on page 10.0-7E shall be limited to 4 parts per shipment, provided the parts are individually wrapped in 1-inch thick polyethylene, in accordance with Figure B-1, of supplement dated August 31, 1990.

(ii) 700 grams U-235; or

(iii) Single fabricated fuel part not exceeding 40 g U-235/inch.

Moderated Shipment

Shipment limited to:

(i) The stated wet safe quantities (without reference to notes or supplements), but excluding those parts named as "elements" as given in the above referenced table; or

(ii) 500 grams U-235; or

(iii) A single fabricated fuel part not exceeding 20 g U-235/inch.

6. The name plate to which the model number is affixed must be fabricated of materials capable of resisting the fire test of 10 CFR Part 71 and maintain its legibility.

7. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12.

8. Expiration date: April 30, 1991.

REFERENCES

United Nuclear Corporation application dated February 1, 1982.

Supplements dated: April 25, 1983; February 19 and 24, April 25 and 28, 1986; and May 7, July 25, August 20, August 31, October 19, and November 27, 1990.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Charles E. MacDonald, Chief
Transportation Branch
Division of Safeguards
and Transportation, NMSS

Date: NOV 2 9 1990

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

APPROVAL RECORD
Model No. UNC-2500 Package
Certificate of Compliance No. 5641
Revision No. 11

By application dated October 19, 1990, as supplemented November 27, 1990, UNC Naval Products requested amendment to Certificate of Compliance No. 5641, for the Model UNC-2500 package. The application requested that one cluster, specified as Item 7f of Table 10.0-1, page 10.0-7E, dated December 23, 1988, of SNM License No. 368, be authorized for shipment, provided that a poison insert is installed in the cluster.

The applicant used the KENO computer code to evaluate the subcriticality of the cluster with the poison insert. The Hansen-Roach neutron cross section set was used with one corrected cross section supplied by the Oak Ridge National Laboratory. To evaluate its computation method, the applicant compared a series of KENO calculations to the results from the analysis method used by the Knoll's Atomic Power Laboratory (KAPL). The KAPL method has previously been shown to have good agreement with independent NRC calculations. The comparison showed that the KENO method produces conservative estimates of reactivity.

The proposed contents were analyzed as Fissile Class III. The model for normal conditions contained two adjacent clusters that were fully flooded and reflected by water. A parametric analyses was used to determine the optimum separation distance between clusters. The analyses took 95% credit for the poison content of the inserts. Since the poison content is verified by physical measurements of the fabricated components, this was considered acceptable. The accident model contained one cluster in a damaged state that was fully flooded and reflected by water.

The application provided the KENO input data for a representative computer run. The reported KENO results show k-eff less than 0.95 including statistical uncertainties for applicable cases. NRC staff reviewed the criticality model and analyses, and found them to be acceptable.

The applicant used hand calculations and drop tests to demonstrate that the poison insert will remain in place during normal conditions of transport. A cluster with the poison insert was dropped a distance of four feet on both the top and bottom ends. The poison insert remained in place, and neither the poison insert nor the hardware securing the poison insert was damaged. Only the normal conditions drop test was considered, since criticality analyses show that even without the poison insert, k-eff remains below 0.95 for a single cluster under hypothetical accident conditions.

This change does not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Charles E. MacDonald, Chief
Transportation Branch
Division of Safeguards and
Transportation, NMSS

Date NOV 2 9 1990