NRC FORM 618
(6-83)
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
9152	8	USA/9152/B( )	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 of Radioactive Materials for Transport and Transportation of Radioactive Material Under Certain Conditions."

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. PREPARED BY *(Name and Address)*:

Chem-Nuclear Systems, Inc.
220 Stoneridge Drive
Columbia, SC 29210

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION:

Chem-Nuclear Systems, Inc. application dated June 18, 1981, as supplemented.

c. DOCKET NUMBER 71-9152

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.: CNS 1-13C II

(2) Description

A shipping cask for radioactive waste. The packaging consists of a double-walled steel circular cylinder separated by 16-gauge wires, 39-1/8" in diameter and 68-1/2" high with a central steel lined cavity 26-1/2" in diameter and 54-1/16" high, approximately 5" of lead surrounds the central cavity. Closure is accomplished by a steel, plug type, lead filled cover secured by twelve (12), 1-1/4" bolts and seal provided by a flat silicone rubber gasket and a silicone rubber O-ring with a sealed 3/8" test port between the gaskets. Approximately 6" lead are in the base and cover. The cask is equipped with a cavity drain line sealed with a 3/8" cap screw and gasket, a steel lifting hook for the cover, and top and bottom impact limiters filled with 16.5 lb/cu ft rigid polyurethane foam clad in steel. The impact limiters are attached to the cask by six (6), 1" ratchet binders. The overall dimensions with impact limiters is 60" in diameter and 99-5/8" high. The package gross weight is approximately 27,000 lbs.

(3) Drawing

The packaging is constructed in accordance with Chem-Nuclear Systems, Inc., Drawing No. E-1-436-111, Sheets 1 and 2, Rev. D.

(b) Contents

(1) Type and form of material

(i) Greater than Type A quantity of nonfissile radioactive material as solidified or dewatered process solids (resins) within a sealed secondary container; or

(ii) Greater than Type A quantity of irradiated solid reactor components within a sealed secondary container.

(iii) Greater than Type A quantity of irradiated fuel (dewatered) within secondary containers described in Chem-Nuclear Systems, Inc. application dated July 16, 1985.

5. (b) (2) Maximum quantity of material per package

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

Not to exceed a decay heat generation of 800 watts and 3,000 pounds including weight of the contents and secondary container; and

For the contents described in 5(b)(1)(i):

Residual water in the secondary container not to exceed the activity stated in Table 4.5.2-1 of the application.

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

The maximum U-235 enrichment of the uranium oxide fuel material must not exceed 3 w/o. The average burnup of the fuel material must not exceed 3,165 MWD/MTU and must be cooled for at least 6.0 years. Fissile contents not to exceed 400 grams U-235 prior to irradiation.

(3) Fissile Class III

Maximum number of packages per shipment for the contents described in 5(b)(1)(iii) One

6. As needed, appropriate shoring must be used in the cask cavity to limit movement of the secondary container during accident condition of transport.

7. The cask cover must be secured by twelve (12), SA-354, Type BD, 1-1/4"-7UNC x 2-1/4" long bolts torqued to 270 ft-lbs ± 10% (lubricated) or 360 ft-lbs ± 10% (dry).

8. Prior to each shipment, the leak tests described in Appendix 8B of the application must be performed. No package is to be delivered to a carrier for transport with a detectable leak using the method of Appendix 8B.

9. (a) For any package containing water and/or organic substances which could radiolytically generate combustible gases, determination must be made by tests and measurements or by analysis of a representative package such that the following criteria are met over a period of time that is twice the expected shipment time:

(i) The hydrogen generated must be limited to a molar quantity that would be no more than 5% by volume (or equivalent limits for other inflammable gases) of the secondary container gas void if present at STP (i.e., no more than 0.063 g-moles/ft^3 at 14.7 psia and 70°F); or

(ii) The secondary container and cask cavity must be inerted with a diluent to assure that oxygen must be limited to 5% by volume in those portions of the package which could have hydrogen greater than 5%.

9. (Continued)

For any package delivered to a carrier for transport, the secondary container must be prepared for shipment in the same manner in which determination for gas generation is made. Shipment period begins when the package is prepared (sealed) and must be completed within twice the expected shipment time.

(b) For any package containing materials with radioactivity concentration not exceeding that for low specific activity material, and shipped within 10 days of preparation, or within 10 days after venting of drums or other secondary containers, the determination in (a) above need not be made, and the time restriction in (a) above does not apply.

10. In addition to the requirements of Subpart G of 10 CFR Part 71:

(i) Each package must meet the acceptance tests and be maintained in accordance with the Maintenance Program of Section 8 of the application.

Alternatively, the leak tests described in Appendixes 8-A and 8-B of the application may be performed in accordance with EG&G Idaho, Inc. letter dated December 20, 1982. Maintenance and repair records shall be furnished to the packaging owner.

(ii) The O-ring must be replaced quarterly with new seals. The flat lid gasket must be replaced annually. The test port and drain line seals must be replaced before each loaded shipment.

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

12. Expiration date: March 31, 1987.

REFERENCES

Chem-Nuclear Systems, Inc. application dated June 18, 1981.

Supplements dated: September 30 and December 31, 1981; April 1, 1982; and July 16, 1985.

EG&G Idaho, Inc. supplement dated: December 20, 1982.

Department of Energy supplement dated: September 7, 1983.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

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

Date: AUG 14 1985

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

Transportation Certification Branch
Approval Record
Model No. CNS 1-13C II Packaging
Docket No. 71-9152

By application dated July 16, 1985, Chem-Nuclear Systems, Inc. requested that 400 grams U-235 contained in $U(3)O_2$ fuel material from the damaged TMI-2 core be approved as additional contents for the Model No. CNS 1-13CII shipping cask.

Since the minimum moderated critical mass for U-235, 3 w/o enriched is about 2,700 grams U-235, the requested 400 gram U-235 is subcritical. The shipment is Fissile Class III in accordance with 10 CFR §71.22.

ORNL calculations using the ORIGEN II computer code estimates that 15.4 kg of UO_2 from the TMI-2 core with a burnup of 3,165 MWD/MTU, cooled for 6 years has approximately 80 curies of Sr-90 plus 90 curies of Cs-137. This activity distributed over the cask cavity presents no shielding problem since 5 inches of Pb surrounds the central cavity.

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

Date: AUG 14 1985

71-9152

Distribution: w/encls
RHOdegaarden (2)
CRMarotta
GJackson
Docket File
NMSS R/F
FCTC R/F
State Health Official
IE HQ
NRC PDR
Regions (5)

RETURN TO A. Machlin 896-SS

AUG 14 1985

FCTC:RHO
71-9152

Chem-Nuclear Systems, Inc.
ATTN: Ms. Susan Kintner
220 Stoneridge Drive
Columbia, SC 29210

Gentlemen:

As requested by your application dated July 16, 1985, enclosed is Certificate of Compliance No. 9152, Revision No. 8, for the Model No. CNS 1-13C II shipping package. This certificate supersedes, in its entirety, Certificate of Compliance No. 9152, Revision No. 7, dated April 24, 1985.

Changes made to the enclosed certificate are indicated by vertical lines in the margin.

Those on the attached list have been registered as users of this package under the general license provisions of 10 CFR §71.12 or 49 CFR §173.471.

The approval constitutes authority to use this package for the shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR §173.471.

Sincerely,

Original Signed by
CHARLES E. MACDONALD

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

Enclosures:
1. Certificate of Compliance No. 9152, Rev. 8
2. Approval Record

cc w/encls:
Mr. Richard R. Rawl
Department of Transportation

OFFICE	FCTC	FCTC	FCTC				
SURNAME	RHOdegaarden:alm	CRMarotta	CEMacDonald				
DATE	08/13/85	08/13/85	08/13/85				

NRC FORM 318 (10-80) NRCM 0240

OFFICIAL RECORD COPY

Model No. CNS 1-13C II Package
Docket No. 71-9152

Addressees: w/encls

Ltr dtd: AUG 1 4 1985

Babcock & Wilcox Company
ATTN: Mr. A. F. Olsen
P.O. Box 239
Lynchburg, VA 24505

Chem-Nuclear Systems, Inc.
ATTN: Ms. Susan Kintner
220 Stoneridge Drive
Columbia, SC 29210

Department of Energy
ATTN: Mr. Roy F. Garrison
DP-122.2
Washington, DC 20545

GPU Nuclear Corporation
ATTN: Mr. Ray E. Hahn
P.O. Box 480
Middletown, PA 17057

Union Carbide Corporation
ATTN: Mr. M. H. Voth
P.O. Box 324
Tuxedo, NY 10987

OFFICE ▶							
SURNAME ▶							
DATE ▶							