

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIALS PACKAGES

U.S. NUCLEAR REGULATORY COMMISSION

1. a. CERTIFICATE NUMBER 9096	b. REVISION NUMBER 8	c. PACKAGE IDENTIFICATION NUMBER USA/9096/A	d. PAGE NUMBER 1	e. TOTAL NUMBER PAGES 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 April 14, 1980, as supplemented.

71-9096

c. DOCKET NUMBER

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 21-300

(2) Description

A steel encased lead shielded cask for low specific activity radioactive material. The cask is a right circular cylinder with 86-3/4-inch OD by 117-1/4-inch height, and a cavity 83-inch ID by 109-1/4-inch height. The 1-inch thick lead shield is supported by outer and inner steel shells 3/4-inch and 1/8-inch thick. The inner plates of the lid and base are laminated steel plates with a total thickness of 1/2-inch. Positive closure of the silicone rubber sealed lid is provided by twelve, 1-1/4-inch diameter cap screws. A secondary lid with a Neoprene seal uses eighteen, 3/4-inch diameter bolts for closure. The cask is welded to a 96-inch square base plate and has two lifting trunnions, three lid lift rings and one secondary lid lift ring. Package gross weight is 57,450 pounds.

(3) Drawings

The packaging is fabricated in accordance with Chem-Nuclear Systems, Inc. Drawing Nos. 1-298-101, Rev. J, and C-114-D-0006, Rev. A.

8506050702 850522
PDR ADOCK 07109096
C PDR

Page 2 - Certificate No. 9096 - Revision No. 8 - Docket No. 71-9096

5. (b) Contents

(1) Type and form of material

- (i) Process solids, either dewatered, solid or solidified in secondary containers, meeting the requirements for low specific activity material; or
- (ii) Solid reactor components in secondary containers, as required that meet the requirements for low specific activity material.

(2) Maximum quantity of material per package

Greater than Type A quantity of radioactive material with the weight of the contents, secondary containers, auxiliary shield, and shoring not exceeding 27,250 pounds.

6. (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/ft³ 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%.

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 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.

- 7. Shoring must be placed between secondary containers (or activated components), auxiliary shield, and the cask cavity to prevent movement during normal conditions of transport.
- 8. The auxiliary shield shown in Drawing No. C-114-E-0004, Rev. No. B, may be used for the shipment of solidified wastes and solid reactor components.

Page 3 - Certificate No. 9096 - Revision No. 8 - Docket No. 71-9096

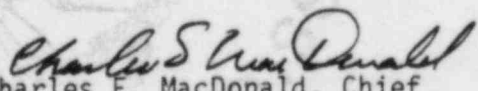
9. The lid lifting lugs must not be used for lifting the cask and shall be covered in transit.
10. Prior to each shipment the lid gaskets must be inspected. The gaskets shall be replaced if inspection shows any defects or every twelve (12) months, whichever occurs first.
11. Packagings fabricated after April 14, 1980, must be constructed of A-516, Grade 70 carbon steel instead of A-36 carbon steel.
12. The package authorized by this certificate must be transported on a motor vehicle, railroad car, aircraft, inland water craft, or hold or deck of a seagoing vessel assigned for sole use of the licensee.
13. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12.
14. Expiration date: May 31, 1985.

REFERENCES

Chem-Nuclear Systems, Inc. application dated April 14, 1980.

Supplement dated: June 28, 1983.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION


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

Date: MAY 22 1985



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

Transportation Certification Branch
Approval Record
Combustible Gas Mixtures

Conditions were imposed on packages containing water and/or organic substances to limit the accumulation of radiolytically generated gases over the shipping period to preclude the possibility of significantly reducing the packaging effectiveness due to explosion.

Part of the conditions included "...it must be determined by tests and measurements of a representative package whether or not...."

There is no reason to believe that calculational methods could not be used as means of determining gas generation. So as not to preclude a valid analysis, part of the condition to limit the accumulation of radiolytically generated gases is revised to read "...it must be determined by tests and measurements or by analysis of a representative package whether or not...."

The analytic approach involves determining the hydrogen generated in the waste by radiolysis based on the absorbed dose of the waste over a given period of time. To satisfy the condition to preclude a combustible mixture, the period since closure and twice the shipping time must be considered. The calculation requires that the properties of the waste are known. These properties may be determined from test and measurement of representative waste forms or from data that is applicable to the waste form. The determination should be documented and retained as part of the records for the shipment.

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

Date: MAY 22 1985