

CERTIFICATE OF COMPLIANCE  
FOR RADIOACTIVE MATERIALS PACKAGES

U.S. NUCLEAR REGULATORY COMMISSION

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. PACKAGE IDENTIFICATION NUMBER	d. PAGE NUMBER	e. TOTAL NUMBER PAGES
9094	8	USA/9094/A	1	3

2. PREAMBLE

- 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."
- 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):

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION:

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

Chem-Nuclear Systems, Inc. application  
dated March 31, 1980.

c. DOCKET NUMBER

71-9094

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 14-195-H

(2) Description

A steel encased lead shielded cask for low specific activity material. The cask is a right circular cylinder 83-1/8-inch diameter by 89-7/8-inch with a 77-inch diameter by 80-1/8-inch cavity. Lead shielding is 2-3/16-inch thick, and is encased in an outer steel shell 3/4-inch thick and inner steel shell 1/8-inch thick. 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"-10UNC bolts for closure. The cask is welded to a 96-inch square based plate, has two lifting trunnions, three lid lift rings and one secondary lid lifting ring. Package gross weight is 56,500 pounds.

(3) Drawing

The packaging is fabricated in accordance with Chem-Nuclear Systems, Inc. Drawing No. 1-189-101, Sheet 1 of 1, Rev. A-F.

(b) Contents

(1) Type and form of material

- Process solids, either dewatered, solid or solidified in secondary containers, meeting the requirements for low specific activity material; or
- 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 and shoring not exceeding 17,700 pounds.

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Page 2 - Certificate No. 9094 - Revision No. 8 - Docket No. 71-9094

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/ft<sup>3</sup> 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) and the cask cavity to prevent movement during normal conditions of transport.
  - 8. The lid lifting lugs must not be used for lifting the cask and shall be covered in transit.
  - 9. Prior to each shipment the lid gaskets must be inspected. These gaskets must be replaced if inspection shows any defects or every twelve (12) months, whichever occurs first.
  - 10. Packagings fabricated after March 31, 1980, must be constructed of A-516, Grade 70 carbon steel instead of A-36 carbon steel.
  - 11. 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.
  - 12. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12.
  - 13. Expiration date: May 31, 1985.

Page 3 - Certificate No. 9094 - Revision No. 8 - Docket No. 71-9094

REFERENCE

Chem-Nuclear Systems, Inc. application dated March 31, 1980.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

*Charles E. MacDonald*

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

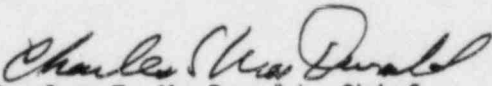
Transportation Certification Branch  
Approval Record  
Combustible Gas Mixtures

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, Chief  
Transportation Certification Branch  
Division of Fuel Cycle and  
Material Safety, NMSS

Date: MAY 22 1985