

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIALS PACKAGES

U.S. NUCLEAR REGULATORY COMMISSION

1. a. CERTIFICATE NUMBER 9105	b. REVISION NUMBER 6	c. PACKAGE IDENTIFICATION NUMBER USA/9105/A	d. PAGE NUMBER 1	e. TOTAL NUMBER PAGES 3
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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 March 4, 1983, as supplemented.

c. DOCKET NUMBER

71-9105

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 6-101

(2) Description

The container is an end loaded steel rectangular box for low specific activity material held in secondary containers. The container is constructed of 4-inch thick steel walls welded to form a 34-1/2-inch wide by 41-inch high by 13-foot long cavity. Positive closure of the 4-inch thick by 42-inch by 48-inch hydraulically actuated door is accomplished with twelve, 1.5-inch bolts. Four lugs are welded to sides along the top. The package gross weight is 54,200 pounds.

(3) Drawings

The package is fabricated in accordance with Chem-Nuclear Systems, Incorporated Drawing Nos.:

2000-D-201, Sheets 1 thru 7, Rev. C; and
2000-D-202, Sheet 1, Rev. F

(b) Contents

(1) Type and form of material

Solid nonfissile irradiated metal hardware meeting the requirements for low specific activity materials, in secondary steel drums which meet the requirements for DOT Specification 7A packaging.

(2) Maximum quantity of material per package

Greater than Type A quantity of radioactive material with weight of the contents, secondary containers, and shoring not exceeding 6,000 pounds. The maximum decay heat must not exceed 10 watts.

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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 and the cask cavity to prevent movement during normal conditions of transport.
8. The twelve, 1-1/2" door (closure) bolts must have a minimum yield strength of 130,000 psi.
9. The packaging must be marked in the area of each lifting lug giving the restrictions on use of the lifting lugs as specified in Revision No. 1 of Section 2.4.3 of the application. The lifting lugs must be made inoperable as required by 10 CFR §71.45(a).
10. 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.
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: December 31, 1988.

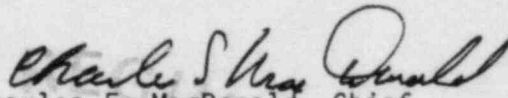
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REFERENCES

Chem-Nuclear Systems, Inc. application dated March 4, 1983.

Supplement dated: September 30, 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

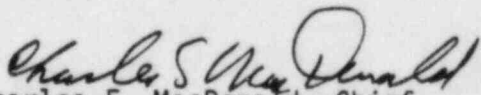
Transportation Certification Branch
Approval Record
Combustible Gas Mixtures

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, Chief
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Division of Fuel Cycle and
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Date: MAY 22 1985