

# **CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIALS PACKAGES**

U.S. NUCLEAR REGULATORY COMMISSION

1. a. CERTIFICATE NUMBER <b>9151</b>	b. REVISION NUMBER <b>7</b>	c. PACKAGE IDENTIFICATION NUMBER <b>USA/9151/A</b>	d. PAGE NUMBER <b>1</b>	e. TOTAL NUMBER PAGES <b>4</b>
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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):

Westinghouse Hittman Nuclear  
Incorporated  
9151 Rumsey Road  
Columbia, MD 21045

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION:

Hittman Nuclear & Development Corporation, application  
dated April 5, 1982, as supplemented.

c. DOCKET NUMBER

71-9151

## 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 Nos.: HN-100 Series 3, CNS 14-170 Series III, and NUS 14-170 Series 1

## (2) Description

Steel encased, lead shielded casks for low specific activity material. The casks are right circular cylinders 81-1/2 inches high by 81-3/4 (or 81-1/2) inches in diameter. The cask cavities are 73-3/8 inches high by 75-1/2 inches in diameter. The cask side walls consists of a 3/8-inch thick inner steel shell, a 1-7/8-(or 1-3/4-)inch lead shell, and a 7/8-inch thick outer steel shell. The base is comprised of two, 2-inch thick steel plates welded together to form a 4-inch thick base which is integrally welded to the inner and outer steel shells of the side wall. A steel flange is welded to the inner and outer steel shells of the side wall at the top. The lid is comprised of two, 2-inch thick steel plates, which are stepped and welded together to mate with the steel flange. The cask closure is sealed by a Neoprene gasket located between the lid and steel flange, positive closure of the lid is accomplished by eight, 1-3/4-inch ratchet binders. The lid contains a centrally located shield plug comprised of two, 2-inch thick steel plates and one, 1-inch thick steel plate stepped and welded. The shield plug is sealed by a Neoprene gasket, and eight, 3/4-inch studs and nuts are used to provide positive closure. The packagings are constructed of A-516, Grade 70, carbon steel. The outer shell will have a minimum yield strength of 46,000 psi.

<u>Model Number</u>	<u>OD, inches</u>	<u>Lead Tk, inches</u>
HN-100 Series 3	81-3/4	1-7/8
CNS 14-170 Series III	81-1/2	1-3/4
NUS 14-170 Series 1	81-3/4	1-7/8

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5.(a) (2) Description (continued)

Tie-down is accomplished by four tie-down lugs welded to the cask body. There are four cask lifting lugs, three lid lifting lugs, and one shield plug lifting lug. The package gross weight is approximately 53,005 pounds.

(3) Drawings

The packagings are fabricated in accordance with Hittman Nuclear & Development Corp. Drawing Nos.: C001-5-9138, Rev. 7; C001-5-9139, Rev. 4; C001-5-9140, Rev. 5; C001-5-9141, Rev. 2; C001-5-9142, Rev. 1; C001-5-9143, Rev. 5; and C001-5-9144, Rev. 3. Optional stainless steel shielding insert in accordance with Drawing Nos.: STD-02-035, Rev. 1; STD-02-036, Rev. 1; and STD-02-037, Rev. 2.

The Model No. CNS 14-170 Series III has one or more of the options shown in Chem-Nuclear Systems, Inc. Drawing No. C-110-D-0006, Rev. A.

The Model No. NUS 14-170 Series I is fabricated in accordance with NUS Corporation Drawing Nos.: 8916 M 2001, Rev. B; 8916 M 2002, Rev. B; 8916 M 2003, Rev. B; 8916 M 2004, Rev. A; and 8916 M 2005, Rev. A.

(b) Contents

(1) Type and form of material

Process solids, either dewatered, solid or solidified, meeting the requirements for low specific activity material, sealed in secondary containers.

(2) Maximum quantity of material per package

Greater than Type A quantity of radioactive material which may contain fissile material provided the fissile material does not exceed the limits in 10 CFR §71.53. The weight of the contents, optional shield insert, and secondary containers shall not exceed 19,205 pounds. When the shield insert is not installed in the cask, the internal decay heat load shall not exceed 7 watts. When the shield insert is installed in the cask, the internal decay heat load shall not exceed 28 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/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. Except for close fitting contents, shoring must be placed between secondary containers and the cask cavity to prevent movement during normal conditions of transport.
8. The lid, shield plug, and cask lifting lugs must be covered in transit to preclude their use as tie-down devices.
9. In addition to the requirements of Subpart G of 10 CFR Part 71:
- (i) Prior to each shipment, the packaging lid seals, if opened (or if security seal is broken), must be inspected. The seals must be replaced with new seals if inspection shows any defects or every twelve (12) months, whichever occurs first.
  - (ii) Each package must meet the Acceptance Tests and Maintenance Program of Section 7.0 and Appendix E of the application. Gamma scan for the shielding acceptance may be based on lead equivalence for lead and steel with all readings within 2.3 inches  $\pm 10\%$  on a 4-inch grid. The Model No. NUS 14-170 Series 1 package must meet the Acceptance and Maintenance Programs of NUS Procedures WM-011, WM-012, WM-013, and WM-014.

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10. Paragraph 8.1 and Figure 1 of Hittman Nuclear & Development Corporation Procedure No. HNDC-0-001-2/3, Rev. 7 (Hittman ltr dtd April 27, 1983) are deleted. Seals which show any visual defects (cracking, gouging, tearing, etc.) must be repaired in accordance with the referenced procedure and Note No. 3 on Hittman Drawing No. C001-5-9138, Rev. 7; NUS Procedure WM-012, Section 7.1; or, replaced with a new seal.
11. The package authorized by this certificate must be transported on a motor vehicle, railroad car, aircraft, inland watercraft, or hold or deck of a seagoing vessel assigned for the 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: June 30, 1987.

#### REFERENCES

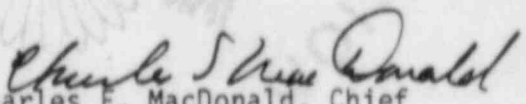
Hittman Nuclear & Development Corporation application dated April 5, 1982.

Supplements dated: April 22 and June 17, 1982; February 3, April 27, and April 29, 1983; and June 13, 1984 (WHNI-E-785).

Chem-Nuclear Systems, Inc. supplement dated: November 16, 1982.

NUS Process Services Supplements dated: June 29 and September 12, 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

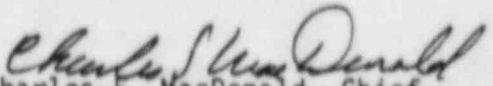
Transportation Certification Branch  
Approval Record  
Combustible Gas Mixtures

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

Date: MAY 22 1985