U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

East Building, PHH-23
1200 New Jersey Ave., SE
Washington, D.C. 20590

COMPETENT AUTHORITY CERTIFICATION FOR A TYPE B(U) RADIOACTIVE MATERIALS PACKAGE DESIGN CERTIFICATE USA/9215/B(U), REVISION 11

This certifies that the radioactive material package design described has been certified by the Competent Authority of the United States as meeting the regulatory requirements for a Type B(U) packaging for radioactive material as prescribed in the regulations of the International Atomic Energy Agency[1] and the United States of America[2].

1. Package Identification - NPI-20WC-6 MkII.

2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9215, Revision 10 (attached).

3. General Conditions -

   a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.

   b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001

   c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

   d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations[1] shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

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[1] "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

[2] Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

CERTIFICATE USA/9215/B(U), REVISION 11

4. Special Condition - The previous revision of this certificate, USA/9215/B(U), Revision 10 remains valid until May 31, 2011.

5. Marking and Labeling - The package shall bear the marking USA/9215/B(U) in addition to other required markings and labeling.

6. Expiration Date - This certificate expires on May 31, 2013.

This certificate is issued in accordance with paragraph 816 of the IAEA Regulations and Section 173.471 of Title 49 of the Code of Federal Regulations, in response to the May 17, 2010 petition by Neutron Products, Inc., Dickerson, MD, and in consideration of other information on file in this Office.

Certified by:

JUN -4 2010

Dr. Madgy El-Sibaie (DATE)
Associate Administrator for Hazardous Materials Safety

Revision 11 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9215, Revision 10.

NRC FORM 618
(8-2000)
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9215	10	71-9215	USA/9215/B(U)	1 OF	4

2. PREAMBLE

a. This certificate is issued to certify that the package (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 and Transportation of Radioactive Material."

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. ISSUED TO *(Name and Address)*

Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson, MD 20842

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

Neutron Products, Inc., application dated September 14, 1992, as supplemented.

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.: NPI-20WC-6 MkII

(2) Description

A steel encased, lead shielded cask contained within a wooden overpack with a steel outer shell. The cask is 24 inches in diameter with a 3/8-inch thick steel spherical shell and a cavity formed by an 8-1/4-inch ID by 3/16-inch thick steel tube. Positive closure of the shielded cask is accomplished by bolted end covers at each end of the cavity. The overpack is approximately 49 inches in diameter and 59 inches high, including the lid lifting eye and the base support structure. The maximum package gross weight is 6,000 pounds.

(3) Drawings

The Model No. NPI-20WC-6 MkII packaging is constructed in accordance with Neutron Products, Inc., Drawing Nos. 240116, Rev. G; and 240122, Sheet 1 of 2, Rev. H, Sheet 2 of 2, Rev. H, except as noted in Condition No. 9 below.

(b) Contents

(1) Type and form of material

(i) Cobalt-60 as sealed sources which meet the requirements of special form radioactive material.

5.(b) Contents (Continued)

(ii) Cesium-137 as sealed sources which meet the requirements of special form radioactive material.

(2) Maximum quantity of material per package

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

For sources contained within drum assembly shown as Item 5 on Neutron Products, Inc., Drawing No. 240122, Sheet 1 of 2, Rev. H:

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

Maximum activity not to exceed 15,000 curies, maximum decay heat not to exceed 240 watts.

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

Maximum activity not to exceed 600 curies, maximum decay heat not to exceed 3.1 watts.

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

For sources contained within drum assembly shown as Item 4 on Neutron Products, Inc., Drawing No. 240122, Sheet 2 of 2, Rev. H:

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

Maximum activity not to exceed 9,500 curies, maximum decay heat not to exceed 150 watts.

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

Maximum activity not to exceed 600 curies, maximum decay heat not to exceed 3.1 watts.

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

For sources contained within drum assembly shown as Item 2 on Neutron Products, Inc., Drawing No. 240122, Sheet 2 of 2, Rev. H:

Maximum activity not to exceed 6,300 curies, maximum decay heat not to exceed 100 watts.

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

   (a) The package must be maintained in accordance with Teletherapy Shipping Packaging Maintenance Procedure R-2019-G, Revision 1, provided in the supplement dated March 12, 2008.

   (b) The package shall be prepared for shipment and operated in accordance with Teletherapy Shipping/Transfer Cask Unloading and Loading Procedures R-2014-G, Revision 1, provided in the supplement dated March 12, 2008.

7. The contents must be secured in the drum assembly so as to restrict movement in any direction to less than 0.25 inch, by lead, steel, or tungsten full diameter plugs and spacers.

8. The gross weight of the package must not exceed 6,000 pounds, and the inner shield cask shall be snug-fitting within the wooden overpack.

9. The two permanent package identification labels and the single temporary package identification holder are attached with 3/16 inch aluminum pop rivets. The two manufacturer's stamped name and date labels are attached with 1/8 inch aluminum pop rivets. The temporary identification labels are held in their holder with a single 1/4 - 20 stainless steel screw. The eight one-quarter inch holes remaining from previous permanent package identification labels and the twelve half inch vent holes are covered d by waterproof tape.

10. Contents described in 5(b)(1)(i) and 5(b)(1)(ii) may not be shipped together in the same package.

11. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

12. Revision No. 9 of this certificate may be used until May 31, 2011.

NRC FORM 618 (8-2000) 10 CFR 71			U.S. NUCLEAR REGULATORY COMMISSION		
CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIAL PACKAGES					
[1] a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9215	10	71-9215	USA/9215/B(U)	4 OF	4

13. Expiration date: May 31, 2013

REFERENCES

Neutron Products, Incorporated, application dated September 14, 1992.

Supplements dated: October 29, 1992; November 17, 1993; September 8, 1997; September 5, 2002; May 1 and October 7, 2003, and February 16, and March 15, 2007; March 12, 2008; April 8, 2010; and electronic correspondence April 15, 2010

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Eric J. Benner, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Date: May 13, 2010

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT
Docket No. 71-9215
Model No. NPI-20WC-6 MkII Package
Certificate of Compliance No. 9215
Revision No. 10

SUMMARY

By application dated April 8, 2010, Neutron Products, Inc., requested an amendment to Certificate of Compliance (CoC) No. 9215 for the Model No. NPI-20WC-6 MkII package. The applicant specifically requested allowance to add Cesium-137 as a new content to the CoC as a sealed source which meets the requirements of a special form radioactive material.

EVALUATION

Thermal Evaluation

The staff reviewed the request for the CoC No. 9215 to transport a special form Cesium-137 source with an activity not to exceed 22.2 Tbq (600 Curies), which corresponds to 3.1 watts. The package was originally designed for special form sources with higher activity, including Cobalt-60 with an activity not to exceed 15,000 Curies, which corresponds to 231 watts. Therefore, the proposed content is bounded by the approved original heat source.

Based on staff review, the staff finds reasonable assurance that the USA/9215/B(U) package design meets the thermal performance requirements set forth in 10 CFR Part 71.

Shielding Evaluation

NRC staff reviewed the applicant's submittal, the applicant's SAR (ML092180416), the above referenced drawings, the current CoC (ML080970006), and the Rev. 0 Safety Analysis Report (SER) (ML030100087). NRC staff reviewed the configurations shown in item 5 of Drawing No. 240122, sheet 1 of 2, Rev. H (ML022800515), and item 4 of Drawing No. 240122, sheet 2 of 2, Rev. H (ML022800529). NRC staff finds that these package configurations are already approved for 15,000 and 9,500 Curies of Cobalt-60 (^{60}Co), respectively. During radioactive decay of ^{60}Co two gamma rays are emitted with energies of 1.17 and 1.33 MeV. During radioactive decay of ^{137}Cs one gamma ray is emitted with an energy of 0.6617 MeV. So ^{60}Co emits two gamma rays that each has roughly twice the energy as the single gamma ray emitted by ^{137}Cs. This strongly suggests that ^{137}Cs is bounded by ^{60}Co. To confirm this staff performed dose rate calculations for shielded and unshielded ^{137}Cs and ^{60}Co point sources. Additional calculations were performed for a 600 Ci ^{137}Cs line source to represent a pencil source. The results of these calculations confirmed the applicant's argument that ^{137}Cs is bounded by ^{60}Co; and that a 600 Ci ^{137}Cs source does not violate the limits under normal conditions of transport or hypothetical accident conditions.

Based on a review of the representation within the application and independent calculations, staff finds reasonable assurance that a package with 600 Ci of ^{137}Cs meets the radiation limits

of Part 71, provided it is in the configurations specified in the CoC Rev. 9, Sections 5(b)(2)(i) and (ii); and provided that the applicant uses at least 2 inches of Lead or Tungsten, or 3 inches of steel as axial shielding material in the drum assembly. This is in addition to the shielding that is already part of the shipping/transfer cask (S/TC) and S/TC cover. The shielding material may be part of the plugs and spacers or part of the source drawer, but must be inserted between the source and the S/TC cover.

CONCLUSION

Condition No. 5(b) of the certificate was revised to add Cesium-137 as a new content - as sealed sources which meet the requirements of special form radioactive material, with a maximum activity not to exceed 600 curies and maximum decay heat not to exceed 3.1 watts. Condition No. 10 was added to ensure Cesium-137 and Cobalt-60 sources are not shipped together in the same package. Condition No. 12 of the certificate was revised which authorizes use of the previous revision of the certificate for a period of approximately one year.

These changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9215, Revision No. 10,
on May 13, 2010

U.S. Department
of Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

**East Building, PHH-23
1200 New Jersey Avenue SE
Washington, D.C. 20590**

CERTIFICATE NUMBER: USA/9215/B(U)-85, Revision 11

ORIGINAL REGISTRANT(S):

Mr. Marvin Turkanis
Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson, 20842
USA

Mr. Marvin Turkanis
Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson, 20842
USA

REGISTERED USER(S):

Nicolas Guibert
Research Reactors Design and Licensing Section
Transnuclear, Inc.
Etablissement Saint Quentin en Yvelines
1, rue des Herons
78180 Montigny-le-Bretonneux, Yvelines
France

Ms. Catherine Anne
Director, Transportation Logistics
Transnuclear, Inc.
7135 Minstrel Way
Suite 300
Columbia, 21045
USA

Mr. Ludger Tembrink
RSB Logistics, Inc.
Robert-Perthel-Str. 71-73
50739
Koln, Germany
Germany

Mr. Donovan Swinnerton
Manager, Key Accounts
RSB Logistics, Inc.
219 Cardinal Cres
Saskatoon, Canada S7L 7K8
Canada

Mr. Donovan Swinnerton
Manager, Key Accounts
RSB Logistics, Inc.
2425 South 4th Street
Paducah, 42003
USA

Kelly Richardt
Regulatory and Quality Manager
Source Production and Equipment Company
113 Teal St.
St. Rose, 70087
USA

Mr. R.D. Donny Dicharry
President
Source Production and Equipment Company
113 Teal Street
St. Rose, 70087-9691
USA

Mr. John Miller
Radiation Safety Officer
International Isotopes Inc.
4137 Commerce Circle
Idaho Falls, 83401
USA