July 30, 2012

Mr. Bill Ransohoff
Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson, Maryland 20842

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9215 FOR THE MODEL NO. NPI-20WC-6 MKII PACKAGE

Dear Mr. Ransohoff:

As requested by your letter dated February 9, 2012, as supplemented on July 5, 2012, enclosed is Certificate of Compliance No. 9215, Revision No. 11, for the Model No. NPI-20WC-6 MKII package. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's safety evaluation report is also enclosed.

The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR 173.471.

If you have any questions regarding this certificate, please contact Bernard White of my staff at (301) 492-3303.

Sincerely,

/RA/ P. Saverot for

Michael D. Waters, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9215
TAC No. L24623

Enclosures:
1. Certificate of Compliance No. 9215, Rev. No. 11
2. Safety Evaluation Report

cc w/encls 1 & 2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy
Registered Users

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(Closes TAC No. L24623)

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ADAMS Package No.: ML12212A205 ADAMS Letter No.: ML12212A274

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DATE:	7/24/12		7/25/12		7/26/12		7/2612		7/26/12		7/28/12		7/3012	

SAFETY EVALUATION REPORT
Docket No. 71-9215
Model No. NPI-20WC-6 MKII
Certificate of Compliance No. 9215
Revision No. 11

SUMMARY

By application, dated February 9, 2012, as supplemented on July 5, 2012, Neutron Products, Inc., requested that the contents of the package be increased from 600 Ci to 20,600 Ci of ^{137}Cs for all three drum configurations.

GENERAL INFORMATION

There were no changes to the general information.

THERMAL EVALUATION

The staff reviewed the request to increase the activity limit for special form ^{137}Cs in the previously approved package from 600 Ci to 20,600 Ci. The design basis heat load for the package is 240 watts, which corresponds to the decay heat of approximately 15,000 Ci of ^{60}Co. Staff performed a set of decay heat calculations to confirm the heat loads determined by the applicant. The results of the staff calculations for the maximum heat loads for 6,300 Ci and 15,000 Ci of ^{60}Co and 20,600 Ci of ^{137}Cs are similar to the maximum heat loads calculated by the applicant. The staff agrees with the applicant's conclusion that the heat load for the proposed content is bounded by the heat load for the approved contents (6,300 Ci ^{60}Co).

Based on staff review, the staff finds reasonable assurance that the package design for the NPI-20WC-6 MKII package with the proposed contents meets the thermal performance requirements set forth in 10 CFR Part 71.

CONTAINMENT EVALUATION

There were no changes to the containment evaluation for the increased contents since the sources are required to meet the requirements of special form sources.

SHIELDING EVALUATION

The package has three configurations which are authorized to ship 6,300 Ci, 9,500 Ci, and 15,000 Ci of ^{60}Co. For the same source configuration and distance from the source, the unshielded exposure rate from ^{137}Cs is approximately 26.5% of the exposure rate from an equal activity of ^{60}Co, such that the photon decay energy from the 6,300 Ci of ^{60}Co is equivalent to 23,800 Ci of ^{137}Cs. Due to its lower energy, ^{137}Cs has much greater attenuation than ^{60}Co but has relatively greater buildup due to contribution from Compton scattering. Staff performed a set of calculations to determine whether the proposed content (20,600 Ci ^{137}Cs) is bounded by the 6,300 Ci of ^{60}Co. The results of these calculations confirmed the applicant's conclusion that the proposed content is bounded by design basis source**;** and that the package loaded with

20,600 Ci ^{137}Cs source continues to meet the dose rate limits after the tests for normal conditions of transport and hypothetical accident conditions.

The applicant also submitted revised pages to correct two errors in the shielding evaluation submitted with the original application in 1992.

The applicant revised the material of the shell shielding that was previously listed as carbon steel when it should have been designated as lead. The appropriate linear absorption coefficient for lead was used in the shielding calculations.

The applicant also corrected the attenuation factor calculated for the shielding from the source to the inner container surface in Table 5.4.1.2. The value was increased by a factor of 10 when it was transferred from the calculation in Table 5.4.1.1. After revising this value and recalculating dose rates, the calculated dose rate on the surface of the package is 104 mrem/hr and 14 mrem/hr at 1 meter from the package surface for 15,000 Ci of ^{60}Co. The applicant has shown that the package will meet the surface and 2-meter dose rate limits in 10 CFR Part 71 for an exclusive use shipment.

Based on a review of the representation and information provided in the application and independent calculations, the staff finds with reasonable assurance that the NPI-20WC-6 MKII package with 20,600 Ci of ^{137}Cs meets the radiation limits of 10 CFR 71.47 and 10 CFR 71.51(a)(2).

CONDITIONS

The following changes have been made to the certificate of compliance:

Condition 5(b)(2)(i) and (ii) contents, was revised to increase the quantity of ^{137}Cs authorized in the package. Condition 5(b)(2)(iii) was revised to add 20,600 curies of ^{137}Cs as authorized contents for all three drum configurations.

Condition No. 12 was removed from the certificate since it expired.

A new Condition No. 12 was added to allow the previous revision of the certificate to be used until May 31, 2013.

The References section has been updated to include this revision request.

CONCLUSION

Based on the statements and representations contained in the application, the staff concludes that 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. 11,
on July 30, 2012