August 26, 2009

Mr. J. A. Ransohoff
President
Neutron Products, Inc.
22310 Mt. Ephraim Road
P. O. Box 68
Dickerson, Maryland 20842

SUBJECT: AUTHORIZATION FOR A ONE-TIME SHIPMENT IN PACKAGE SERIAL NUMBER OP-10/TC 6, OF THE MODEL NO. NPI-20WC-6 MKII (TAC NO. L24364)

Dear Mr. Ransohoff:

As requested by your application dated July 16, 2009 as supplemented August 12, 19, and 20, 2009, pursuant to Title 10 of the Code of Federal Regulations Part 71, Certificate of Compliance (CoC) No. 9215, for Model No. NPI-20WC-6 MK II package is amended as follows:

> Authorization for the one-time shipment of a cobalt-60 special form source, with total activity not to exceed 20 Terabecquerels (550 Curies) to Southwest Research Institute in San Antonio, Texas, in package Model No. NPI-20WC-6 MkII, overpack serial number OP-10 and transfer cask serial number TC 6. The shipment will be performed in accordance with CoC 9215, with the following exception:
>
> The outer steel shell component for OP-10, on the bottom surface of the package, has a steel patch welded over a “gash” measuring approximately 4-inch by ¼- inch, near the bottom seam.

The following additional conditions apply:

1. All other conditions of CoC No. 9215 shall remain the same.

2. The package must be transported in an upright orientation, resting on the skids, and secured during transit to ensure the package remains in the upright orientation.

3. This authorization is for one shipment, and shall expire on December 31, 2009.

Please notify me when this shipment has been completed. If you have any questions regarding this authorization, please contact me or Michele Sampson of my staff at (301) 492-3300.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

/RA/

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

Docket No. 71-9215
TAC No. L24364

Enclosure: Safety Evaluation Report

cc: R. Boyle, Department of Transportation

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Sincerely,

/RA/

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

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DATE:	8/21/09		8/21/09		8/24/09		8/24/09		8/24/09		8/26/09	
OFC:	SFST	N										
NAME:	E. Benner											
DATE:	8/26/09		/ /09		/ /09		/ /09		/ /09		/ /09	

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SAFETY EVALUATION REPORT

Docket No. 71-9215
Model No. NPI-20WC-6 MkII
Certificate of Compliance No. 9215

SUMMARY

By application dated July 16, 2009, as supplemented August 12, 19, and 20, 2009, Neutron Products, Inc. (NPI or the applicant) requested an authorization under Certificate of Compliance (CoC) No. 9215 for the Model No. NPI-20WC-6 MkII. NPI requested the one-time shipment of a cobalt-60 special form source, with total activity not to exceed 20 Terabecquerels (550 Curies) to Southwest Research Institute in San Antonio, Texas, in package Model No. NPI-20WC-6 MkII, overpack serial number OP-10 and transfer cask serial number TC 6.

This one-time only shipment is for the return of the source for disposition at Southwest Research Institute in San Antonio, TX. Based on the statements and representations in the application, staff agrees that this one-time shipment, with the additional conditions stated below, meets the requirements of Title 10 of the Code of Federal Regulations (10 CFR) Part 71.

EVALUATION

By application dated July 16, 2009, as supplemented August 12, 19, and 20, 2009, NPI identified that Model No. NPI-20WC-6 MkII, overpack serial number OP-10 had a weld repair made to the outer shell which did not fully comply with all parts of 10 CFR 71, Subpart H, "Quality Assurance." At the time the potential non-conformance was identified, the package was in-transit for delivery of a cancer therapy source. The source exchange was completed, and the replaced source, with total activity of 20 Terabecquerels (TBq) (550 Curies (Ci)), subsequently was loaded into the package. This activity is roughly 1/30th of the quantity of cobalt-60 authorized for transport in the Certificate. NPI has requested a one-time only shipment for the return of the source for disposition at Southwest Research Institute in San Antonio, TX.

The applicant identified that Model No. NPI-20WC-6 MkII, overpack serial number OP-10, was damaged with approximately a 4-inch by ¼-inch separation (tear) in the outer shell, located at the bottom seam of the shell where it meets the center support I-Beam. The damage was repaired by welding a patch, several ounces of 12-gage carbon steel, measuring approximately 6-inches by 1-inch, to the steel shell. The applicant identified that the weld repair may not have been performed in accordance with applicable quality assurance requirements. The applicant confirmed, by inspection, that the wooden jacket component of OP-10 was not damaged by the tear in the outer shell, and was removed from the outer shell prior to the weld repair being performed. The wooden jacket component was inspected and weighed in accordance with NPI Procedure R-2019-G, Revision 1.

The applicant analyzed the potentially non-conforming weld repair and determined that it was not credible that the addition of the minimally sized patch would adversely affect the integrity of the outer steel shell.

Due to the potential non-conformance of the weld repair, staff cannot rely on the patch to perform to the same level as an undamaged outer shell. The authorization is conditioned to limit the package to upright orientation during transportation, to minimize the reliance on this portion of the shell to perform during the normal conditions for transportation. This is the normal orientation for transport, with the package resting on the skids.

The staff reviewed NPI's application for use of the Model NPI-20WC-6 MkII package, herein referred to as the safety analysis report (SAR), dated September 14, 1992, as supplemented 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, and March 12, 2008.

Based on the review of the July 16, 2009, application, as supplemented, and the SAR, staff confirmed that the 20 TBq (550 Ci) content is bounded by the original design basis internal heat generation load which equates to 15,000 Ci of cobalt-60.

Under the hypothetical accident conditions, the SAR, Section 2.7.1, identifies that the outer shell will sustain significant damage in the 30-foot drop test. Staff concludes that the repaired outer shell may suffer additional damage, potentially resulting in propagation of the tear in the bottom of the shell, which may expose additional surface area of the wooden jacket. The thermal test results in the SAR, Section 3.5, rely on testing performed by Sandia Corporation in the 1960's. The SAR, Appendix 2.10.9, page 154, states that "At least 10 to 15 percent of the outer surface area of most large containers could be exposed to a fire environment for 1 hour and still not be in danger of loss of shielding." Given the information provided by the applicant and the upright shipment orientation of the package, the staff has reasonable assurance that a potential tear from the non-conforming weld would not exceed the 15 percent damaged condition previously analyzed for the hypothetical accident conditions under the original certification of this package.

In conclusion, the staff has reasonable assurance that the package has been designed, has been constructed, and can be prepared for shipment, in a manner that meets the requirements of 10 CFR 71.51 for Type B packages. This authorization is limited to one shipment of the 20 TBq source, in consideration of the need to safely disposition it in its current configuration, and to limit potential challenges to the non-conforming weld repair.

CONDITIONS

The CoC has been amended by letter to authorize the one-time shipment of Model No. NPI-20WC-6 MkII, overpack serial number OP-10 and transfer cask serial number TC 6, with a potentially non-conforming weld repair to the bottom surface of the package. The following additional conditions apply:

1. All other conditions of CoC No. 9215 shall remain the same.

2. The package must be transported in an upright orientation, resting on the skids, and secured during transit to ensure the package remains in the upright orientation.

3. This authorization is for one shipment, and shall expire on December 31, 2009.

CONCLUSION

Based on the statements and representations in the NPI application dated July 16, 2009, as supplemented August 12, 19, and 20, 2009, the staff agrees that the one-time shipment of the Model No. NPI-20WC-6 Mk II package, overpack serial number OP-10 and transfer cask serial number TC 6, meets the requirements of 10 CFR Part 71, subject to the conditions listed above.

Issued on August 26, 2009