Isotope Files

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Gen W. Roy, Chief, Materials Inspection and
Enforcement Branch, Division of Compliance, HQ

COMPLIANCE INQUIRY MEMORANDUM
DEFENSE ATOMIC SUPPORT AGENCY
ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE
BETHESDA, MARYLAND 20014
LICENSE NO. 19-08330-03
NEUTRON PRODUCTS, INCORPORATED
DICKERSON, MARYLAND
LICENSE NO. 19-12667-01
CONTAMINATION

File under

On October 19, 1970, CO:I received a copy of a letter dated October 9, 1970 from the Defense Atomic Support Agency (DASA) to the Director, Division of Materials Licensing reporting, as required by license condition, concentrations in their pool exceeding maximum permissible limits. The cobalt slugs referred to in the letter and causing the high concentrations were transferred on September 28, 1970 from Neutron Products, Inc., Dickerson, Maryland to DASA.

This office will obtain additional information concerning this shipment and will review Neutron Products, Inc. procedures for inspection of shipments at the next inspection scheduled for May, 1971.

Alvin F. Ryan
Investigation Specialist

Enclosures:
1. Licensee ltr dtd 10/9/70
2. Completed statistical form

cc: Neutron Products file

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DEFENSE ATOMIC SUPPORT AGENCY
ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE
BETHESDA, MARYLAND 20014

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Director
Division of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Gentlemen:

This letter is submitted in accordance with the provisions of paragraphs 13B and C of Byproduct Material License 19-08330-03, dated 21 September 1970.

On 28 September, we accepted shipment of thirty (30) cobalt slugs described in the application dated 1 December 1969. The transferrer provided certification of surface contamination on each slug. This certification indicated a maximum smearable removable contamination of 0.003 microcuries.

The concentration of radioactivity in the pool before the cobalt loading operation was 1×10^{-9} μci/ml. A routine water sample, taken after completion of the loading operation was analyzed on 1 October and indicated a concentration of 6.2×10^{-8} μci/ml. This concentration represents a total activity (in 12,000 gal of water) of 2.7 μci, a factor of approximately 50 over the present limits set forth in the license. The Division of Licensing and the Division of Compliance, USAEC, were notified of these results by telephone conversations from Major J. Kendig, AFRRI to Mr. P. C. Jerman and Mr. E. Hendricks.

Several smears of the transfer cask, source holding cage and handling tools showed removal contamination of 0.007 μci, 0.033 μci and .008 μci respectively. In accordance with our established procedures, the sources were placed in isolation

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cans on 1 October in preparation for leak testing. Each isolation can (containing 10 sources) was flushed with approximately 5.5 liters of water. Analysis of the rinse solutions is summarized below:

Sample	Activity	Total Activity
Can No. 1	6.19×10^{-5} μci/ml	.34 μci
Can No. 2	5.56×10^{-5} μci/ml	.30 μci
Can No. 3	3.03×10^{-5} μci/ml	.16 μci

The leak testing commenced on 2 October. Analysis of the water samples from each isolation can and from the pool was performed on 5 October. The results are summarized below:

Sample	Activity	Total Activity
Can No. 1	2.15×10^{-5} μci/ml	.12 μci
Can No. 2	2.48×10^{-5} μci/ml	.13 μci
Can No. 3	1.01×10^{-5} μci/ml	.06 μci
Pool Water	4×10^{-9} μci/ml	.02 μci

From these results it is apparent that there exists no serious leak of the cobalt slugs and that the concentration of cobalt-60 in the pool water could have resulted from removable surface contamination. Based on this assumption, decontamination of the cobalt sources was initiated on 5 October. The basic technique being employed is to fill the isolation cans with 5.5 ℓ of Radiacwash Sol (1:10). The decontaminant is changed after approximately 24 hours. Samples of the decontaminant will be analyzed to assess the effectiveness of the decontamination technique. Following a series of copious rinses with water, a final wash with ~5% acetic acid solution to neutralize any residual phosphates and/or alkali insoluble materials will be followed with several more water rinses; finally 5.5 ℓ of distilled water will be introduced and allowed to remain 24 hours. Based upon the initial findings relative to normal background levels of activity in the cobalt pool, and on ensuing results of our decontamination exercise it may be deemed advisable to increase presently established limits of pool water activity. If such is the case, a formal

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application for ammendment of these limits will be forwarded.

Should you have any questions or comments on the contents of this letter, please feel free to contact the members of my Staff.

Sincerely yours,

HUGH B. MITCHELL
Colonel, USAF, MC
Director