

WILLIAMS COLLEGE WILLIAMSTOWN, MASSACHUSETTS 01267

DEPARTMENT OF CHEMISTRY  
Thompson Chemical Laboratory  
(413) 597-2323

September 13, 1982

Mr. Thomas T. Martin, Director  
Division of Engineering and Technical Programs  
U.S. Nuclear Regulatory Commission  
Region I  
631 Park Avenue  
King of Prussia, Pennsylvania 19406

Regarding: Docket No. 30-17178  
License No. 20-04028-04  
Inspection No. 82-01

Dear Mr. Martin:

As a result of the inspection by Mr. R. Ladun on 22-23 July 1982, and as outlined in your letter of 23 August 1982, it appears that one of our activities was not conducted in full compliance with NRC requirements. Apparently, as of 23 July 1982, a sealed source containing 165 microcuries of americium-241 had not been tested for contamination or leakage at regular three-month intervals.

To bring our program into compliance on this point: (1) Professor L. J. Kaplan, Williams College Radiation Safety Officer, sent a memorandum (copy enclosed) to Professor Ballard Pierce, Chairman of Physics Department, detailing the license requirement and requesting that he or another appropriately trained representative of the Physics Department perform the necessary tests. Detailed written instructions (copy enclosed) as well as personal instruction were given so that the tests could be properly conducted. Such wipe tests were then conducted and indicated that no removable contamination was present and that no leakage has occurred (i.e., less than  $5 \times 10^{-3}$   $\mu\text{Ci}$  removable activity was detected). (2) The Radiation Safety Officer will conduct periodic inspection of the log books and perform the test when necessary to ensure full compliance. (3) Full compliance has effectively been achieved as of this date.

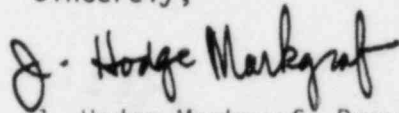
Mr. Thomas T. Martin

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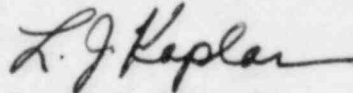
September 13, 1982

As mentioned in the telephone conversation in August between Professor Kaplan and Mr. John Kemmen (uncertain of spelling) of your office, please communicate directly with Radiation Safety Officer Kaplan or Professor J. Hodge Markgraf, Provost, regarding matters pertaining to this license.

Sincerely,



J. Hodge Markgraf, Provost  
Professor of Chemistry



Lawrence J. Kaplan  
Radiation Safety Officer  
Associate Professor of Chemistry

encl.  
nb

WILLIAMS COLLEGE WILLIAMSTOWN, MASSACHUSETTS 01267

DEPARTMENT OF CHEMISTRY  
Thompson Chemical Laboratory  
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July 28, 1982

MEMORANDUM

To: Professor Ballard Pierce  
From: Professor L.J. Kaplan, Radiation Safety Officer  
Subject: Wipe test of Am 241-sources

On July 22 and 23, Williams College received a thorough inspection by Mr. Richard Ladun of the United States Nuclear Regulatory Commission. One of the points of noncompliance that Mr. Ladun cited was our failure to perform wipe tests on the 165  $\mu\text{Ci}$  and 20  $\mu\text{Ci}$  Am-241 sealed sources. Our license specifically states.

...each source designed for the purpose of emitting alpha particles shall be tested (for leakage) at intervals not to exceed three months.

Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used.

The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. ...Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

(Just as a side note--these same conditions were specifically stated in the license previously held by Williams College #20-04028-03 for the Am-241 sources.)

In order to bring our program into compliance and to prevent citations in the future, I hereby request that you or another appropriately trained representative of the Physics Department perform the necessary tests. (See instructions on attached sheet.) I will be happy to provide instruction for the wipe tests and, in the event someone is occasionally not available, to perform these tests myself. The results of these tests should be entered in the log books, maintained in the safe in Room U30 BSC, and be available for my periodic inspection and inspection by the NRC.

encl.  
nb

July 29, 1982

Procedure for Wipe Test of Am-241  
(Must Be Done Every Three Months)

1. Carefully remove the sources from the safe in room 30 BSC. (Both sources must be tested every three months.)
2. Using an appropriate survey meter (capable of detecting alpha particles), determine the background on a piece of filter paper.
3. While holding the Americium source with a tweezer, very gently wipe across the surface of the source with the filter paper. (Remember to emit alpha particles, the window of the source must be very thin and fragile--so wipe gently.)
4. Determine the activity on the filter paper after the wipe.
5. Calculate the activity (if any) removed and express it in microcuries.

Calculation:

The method must be able to detect  $5 \times 10^{-3} \mu\text{Ci}$ . This is equivalent to 10,000 dpm since

$$5 \times 10^{-3} \mu\text{Ci} = 5 \times 10^{-9} \text{Ci} \times \frac{2.2 \times 10^{12} \text{dpm}}{\text{Ci}} = 11,000 \text{dpm}.$$

And  $10,000 \text{dpm} = 0.5 \text{mrem/hr}$ .

Assuming 10% overall geometry:  $10,000 \text{dpm} \rightarrow 1,000 \text{cpm}$ .

Therefore, if the net activity removed from the Americium source is

$$0.02 \text{mrem/hr} = 400 \text{dpm} = 40 \text{cpm}$$

This is equivalent to  $2 \times 10^{-4} \mu\text{Ci}$  which is less than the  $5 \times 10^{-3} \mu\text{Ci}$  the method must detect.

6. Enter the value determined above in the log book located in the safe. Be sure to date and sign the entry.
7. If the activity is twice background or greater, notify the Radiation Safety Officer, Professor Kaplan, in 263 BSC (ext. 2184) or Professor Pierce in 105 TPL (ext. 2401).