

April 2, 1997

Wayne D. Gass, Ph.D.
Dean of Administration
and Business Manager
Mount Holyoke College
South Hadley, MA 01075-1449

SUBJECT: INSPECTION NO. 030-00764/96-001 AND CAL NO. 1-96-009

Dear Dr. Gass:

This letter refers to your January 3, 1997 correspondence, in response to our December 5, 1996 letter. This also refers to your letters dated August 29 and October 26, 1996, in response to our Confirmatory Action Letter (CAL) 1-96-009, dated August 14, 1996. These letters have been reviewed and additional information is needed.

It does not appear that the faculty member's skin dose exceeds the limits specified in 10 CFR 20.1201(a)(2). However, his actual skin dose may be larger than those that you calculated. Please provide a reassessment of skin dose for the faculty member taking into account the considerations discussed in items 2 and 3 below. In addition, please provide the information addressed in items 1 through 5 as follows:

1. Although your October 2, 1996 letter, with your final report provided a good description of the event that occurred in Shattuck Hall on August 2, 1996, there is very little information regarding the times of various actions. Please provide your best estimate for the following:
 - a. The time the cobalt-58 source integrity was compromised;
 - b. The time the initial skin contamination occurred;
 - c. The time the faculty member washed his hands and tools;
 - d. The times of any other skin decontamination efforts;
 - e. The time the faculty member was transferred to Franklin Medical Center;
 - f. The time the faculty member was discharged from Franklin Medical Center.
2. In your October 2, 1996 letter, you provided dose estimates. With regard to skin dose you stated:

We approximated the right hand and forearm to be contaminated with a total of 17 microcuries of cobalt-58 for the first hour and with 20 nanocuries/cm² until they decontaminated this area at Franklin Medical Center. We used 17 microcuries for the initial contamination of the skin since this was the same level of contamination found on the tools.

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According to your "Description of the Incident",

The tools read "off scale on the low scale of the ion chamber." The faculty member went to the men's bathroom to wash his hands and tools.

Since the tools were washed or decontaminated by the faculty member, it does not appear reasonable to base initial skin contamination on the residual 17 microcuries of cobalt-58 found on the tools.

It is reasonable to assume that the initial activity on the tools would provide an indication of the initial activity that deposited on the skin. However, it would not be unreasonable to assume that up to 90 percent of the activity initially on the tools was removed when then faculty member washed them in the men's bathroom. If up to 90 percent of the activity was removed, then 17 microcuries would be an underestimate of the initial activity on the skin. Please reevaluate the initial activity deposited on the skin or provide clarification or more justification for the use of 17 microcuries.

Additionally, you did not provide justification or information on skin activity measurements to demonstrate 20 nanocuries/cm² of right hand and forearm skin contamination until this area was decontaminated at Franklin Medical Center. Please provide this information.

3. In your October 2, 1996 letter you provided information on "Cleanup and Recovery" including a physical description of the contamination as follows:

All indications during initial assessment and cleanup showed that the source did not disintegrate into a fine powder. It broke into discrete pieces that were very easy to identify with a pancake GM probe. Cleanup personnel did not find large areas of contamination as expected for fine dust or powder.

However, when you assessed the faculty member's skin dose you stated, in part, that a large area of the skin encompassing the entire right hand and forearm was contaminated. If the source did not disintegrate into a fine dust or powder, it is not clear how such a large area of skin could have been contaminated. The decision to calculate skin dosimetry based upon an area of approximately 360 cm² does not appear justified. Please provide justification for use of 360 cm² or define a smaller area of contamination.

4. Your January 3, 1997 letter provided 12 separate VARSKIN dose calculations. It appears that the last two calculations which describe a "Disc Source with Radius" are for the right hand and forearm for two differing periods of time and activity. In your October 2, 1996 letter you stated that, "We found seven other discrete areas of contamination on the researcher's skin and clothing." These seven areas account for seven additional VARSKIN dose calculations. However, it is not immediately apparent how to differentiate these calculations from one another. For each of the VARSKIN calculations, please specify where each contamination was located, the estimated activity deposited and

W. D. Gass, Ph.D.
Mount Holyoke College

-3-

your method of assessing estimated activity, and in the case of clothing contamination, the estimated distance from the activity to the skin. Please also describe which skin contaminations are associated with the 3 remaining VARSKIN calculations you included in your January 3, 1997 letter.

5. Please provide information on the method(s) used to assess the faculty member's internal dose from cobalt-58.

Please submit to this office within thirty (30) days of receipt of this letter a written statement containing the requested information.

Your cooperation with us is appreciated.

Sincerely,

ORIGINAL SIGNED BY:
JOHN D. KINNEMAN

John D. Kinneman, Chief
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

Docket No. 030-00764
License No. 20-01677-02

cc:
Edward L. Wilds, Jr.
Radiation Safety Officer

Commonwealth of Massachusetts

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-4-

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