

HOWARD UNIVERSITY

WASHINGTON, D.C. 20059

January 19, 1983

OFFICE OF THE VICE PRESIDENT  
FOR HEALTH AFFAIRS  
Radiation Safety Committee

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John E. Glenn, Ph.D., Chief  
Nuclear Materials Section B  
Division of Engineering and  
Technical Programs  
U.S. Nuclear Regulatory Commission  
Region I  
631 Park Avenue  
King of Prussia, Pennsylvania 19406

RE: License No. 08-03075-07  
Docket No. 030-01321  
Control No. 07493

Dear Dr. Glenn:

I have enclosed our response to questions contained in your December 29, 1982 letter concerning the review of our renewal application (License No. 08-03075-07). If additional information is needed to complete your review, I shall be pleased to supply it upon request.

I remain,

Sincerely yours,

*George A. Ferguson*

George A. Ferguson, Ph.D., Chairman  
Howard University Radiation Safety  
Committee

dmr

Enclosures

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LICENSE NO. 08-03075-07  
DOCKET NO. 030-01321  
CONTROL NO. 07493  
Letter dated December 29, 1982

ITEM NO. 1 - CALIBRATION ACCURACY OF RADIUM-226 SOURCE

An exposure rate field was determined for the 10mg Radium-226 source using an Eberline E-120 Survey Meter equipped with a HP-270 probe. The unit was calibrated in an exposure field created by a 25 Curie Cs-137, NBS traceable source assayed in January 1968.<sup>1/</sup> This ATOMCHEM Corp. CEA Type CS2-6 source is housed in an ATOMCHEM Model 1005 calibrator (NRC License No. 08-04289-09, issued to the D.C. Government, expiration date August 1987). A comparison of the actual survey meter reading in the Radium-226 exposure field to an exposure vs. distance chart calculated using the formula:

$$\text{mR/hr.} = \frac{\text{mg. of Ra-226 } ^{2/}}{\text{yd}^2}$$

resulted in an agreement exceeding 90%<sup>3/</sup>

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<sup>1/</sup> National Bureau of Standards, Report of Calibration, Section 504.02  
Project 5040629, RES 1392/69, Test No. G-39596, DB 697:059; 699:069;  
698:165; 168, October 4, 1968.

<sup>2/</sup> H.E.W., Radiological Health Handbook, Pg. 32, 1970.

<sup>3/</sup> Reg. Guide 10.8, Item 10(a), October 1980.

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LICENSE NO. 08-03075-07  
DOCKET NO. 030-01321  
CONTROL NO. 07493  
ITEM #10

PROGRAM FOR MAINTAINING OCCUPATIONAL RADIATION EXPOSURES AT MEDICAL INSTITUTIONS  
ALAKA

Howard University Hospital  
October 28, 1982

1. Management Commitment

- a. We, the management of this hospital are committed to the program described in this paper for keeping exposures (individual and collective) as low as is reasonably achievable (ALARA). In accord with this commitment, we hereby describe an administrative organization for radiation safety and will develop the necessary written policy, procedures, and instructions to foster the ALARA concept within our institution. The organization will include a Radiation Safety Committee and a Radiation Safety Officer.
- b. We will perform a formal annual review of the radiation safety program, including ALARA considerations. This shall include reviews of operating procedures and past exposure records, inspections, etc., and consultations with the radiation protection staff or outside consultants.
- c. Modification to operating and maintenance procedures and to equipment and facilities will be made where they will reduce exposures unless the cost, in our judgment, is considered to be unjustified. We will be able to demonstrate, if necessary, that improvements have been sought, that modifications have been considered, and that they have been implemented where reasonable. Where modifications have been recommended but not implemented, we will be prepared to describe the reasons for not implementing them.
- d. In addition to maintaining doses to individuals as far below the limits as is reasonably achievable, the sum of doses received by all exposed individuals will also be maintained at the lowest practicable level. It would not be desirable, for example, to hold the highest doses to individuals to some fraction of the applicable limit if this involved exposing additional people and significantly increasing the sum of radiation doses received by all involved individuals.

2. Radiation Safety Committee

a. Review of Proposed Users and Uses

1. The Radiation Safety Committee will thoroughly review the qualifications of each applicant with respect to the types and quantities of materials and uses for which he has applied to ensure that the applicant will be able to take appropriate measures to maintain exposure ALARA.

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2. When considering a new use of byproduct material, the Radiation Safety Committee will review the efforts of the applicant to maintain exposure ALARA. The user should have systematized procedures to ensure ALARA and shall have incorporated the use of special equipment such as syringe shields, rubber gloves, etc., in his proposed use.
3. The Radiation Safety Committee will ensure that the user justifies his procedures and that doses will be ALARA (individual and collective).

b. Delegation of Authority

1. The Radiation Safety Committee will delegate authority to the Radiation Safety Officer for enforcement of the ALARA concept.
2. The Radiation Safety Committee will support the Radiation Safety Officer in those instance where it is necessary for the Radiation Safety Officer to assert his/her authority. Where the Radiation Safety Officer has been overruled, the Committee will record the basis for its action in the minutes of the Committee's quarterly meeting.

c. Review of ALARA Program

1. The Radiation Safety Committee will encourage all users to review current procedures and develop new procedures as appropriate to implement the ALARA concept.
2. The Radiation Safety Committee will perform a quarterly review of occupational radiation exposure with particular attention to instances where Investigational Levels in Table 0-1 below are exceeded. The principal purpose of this review is to assess trends in occupational exposure as an index of the ALARA program quality and to decide if action is warranted when Investigational Levels are exceeded .
3. The Radiation Safety Committee will evaluate our institution's overall efforts for maintaining exposures ALARA on an annual basis. This review will include the efforts of the Radiation Safety Officer, authorized users, and workers as well as those of management.

3. Radiation Safety Officer

a. Annual and Quarterly Review

1. Annual review of the radiation safety program. The Radiation Safety Officer will perform an annual review of the radiation safety program for adherence to ALARA concepts. Reviews of specific procedures may be conducted on a more frequent basis.
2. Quarterly review of occupational exposures. The Radiation Safety Officer will review at least quarterly the external radiation exposures of authorized users and workers to determine that their exposures are ALARA in accordance with the provisions in Section 6 of this program.
3. Quarterly review of records of radiation level surveys. The Radiation Safety Officer will review radiation levels in unrestricted and restricted areas to determine that they were at ALARA levels during the previous quarter.

b. Education Responsibilities for ALARA Program

1. The Radiation Safety Officer will schedule briefings and educational sessions to inform workers of ALARA program efforts.
2. The Radiation Safety Officer will ensure that authorized users, workers and ancillary personnel who may be exposed to radiation will be instructed in the ALARA philosophy and informed that management, the Radiation Safety Committee, and the Radiation Safety Officer are committed to implementing the ALARA concept.

c. Cooperative Efforts for Development of ALARA Procedures

Radiation workers will be given opportunities to participate in formulation of the procedures that they will be required to follow.

1. The Radiation Safety Officer will be in close contact with all users and workers in order to develop ALARA procedures for working with radioactive materials.
2. The Radiation Safety Officer will establish procedures for receiving and evaluating the suggestions of individual workers for improving health physics practices and will encourage the use of those procedures.



d. Reviewing Instances of Deviation from Good ALARA Practices

The Radiation Safety Officer will investigate all known instances of deviation from good ALARA practices and, if possible, will determine the causes. When the cause is known, the Radiation Safety Officer will require changes in the program to maintain exposures ALARA.

4. Authorized Users

a. New Procedures Involving Potential Radiation Exposures

1. The authorized user will consult with, and receive the approval of, the Radiation Safety Officer and/or Radiation Safety Committee during the planning stage before using radioactive materials for a new procedures.
2. The authorized user will evaluate all procedures before using radioactive materials to ensure that exposures will be kept ALARA. This may be enhanced through the application of trial runs.

b. Responsibility of Authorized User to Persons Under His/Her Supervision

1. The authorized user will explain the ALARA concept and his/her commitment to maintain exposures ALARA to all persons under his/her supervision.
2. The authorized user will ensure that persons under his/her supervision who are subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.

5. Persons Who Receive Occupational Radiation Exposure

- a. The worker will be instructed in the ALARA concept and its relationship to working procedures and work conditions.
- b. The worker will know what recourses are available if he/she feels that ALARA is not being promoted on the job.

6. Establishment of Investigational Levels In Order to Monitor Individual Occupational External Radiation Exposures

This institution hereby establishes Investigational Levels for occupational external radiation exposure which, when exceeded, will initiate review or investigation by the Radiation Safety Committee and/or the Radiation Safety Officer. The Investigational Levels that we have adopted are listed in Table C-1 below. These levels apply to the exposure of individual workers.

TABLE 0-1

	<u>Investigational Levels</u> (mrems per calendar quarter)	
	<u>Level I</u>	<u>Level II</u>
1. Whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads	125	375
2. Hands and forearms; feet and ankles	1875	5625
3. Skin of whole body*	750	2250

\*Not normally applicable to nuclear medicine operations except those using significant quantities of beta-emitting isotopes.

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The Radiation Safety Officer will review and record on Form NRC-5, "Current Occupational External Radiation Exposures", or an equivalent form (e.g., dosimeter processor's report), results of personnel monitoring not less than once in any calendar quarter as required by §20.401 of 10CFR Part 20. The following actions will be taken at the Investigational Levels as stated in Table 0-1:

- a. Quarterly exposure of individuals to less than Investigational Level I.

Except when deemed appropriate by the Radiation Safety Officer, no further action will be taken in those cases where an individual's exposure is less than Table 0-1 values for the Investigational Level I.

- b. Personnel exposures equal to or greater than Investigational Level I, but less than Investigational Level II.

The Radiation Safety Officer will review the exposure of each individual whose quarterly exposures equal or exceed Investigational Level I and will report the results of the reviews at the first Radiation Safety Committee meeting following the quarter when the exposure was recorded. If the exposure does not equal or exceed Investigational Level II, no action related specifically to the exposure is required unless deemed appropriate by the Committee. The Committee will, however, consider each such exposure in comparison with those of others performing similar tasks as an index of ALARA program quality and will record the review in the Committee minutes

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- c. Exposure equal to or greater than Investigational Level II.

The Radiation Safety Officer will investigate in a timely manner the causes of all personnel exposures equaling or exceeding Investigational Level II and, if warranted, will take action. A report of the investigation, actions taken, if any, and a copy of the individual's Form NRC-5 or its equivalent will be presented to the Radiation Safety Committee at its first Radiation Safety Committee meeting following completion of the investigation. The details of these reports will be recorded in the Radiation Safety Committee minutes. Committee minutes will be sent to the management of this institution for review. The minutes, containing details of the investigation, will be made available to NRC inspectors for review at the time of the next inspection.

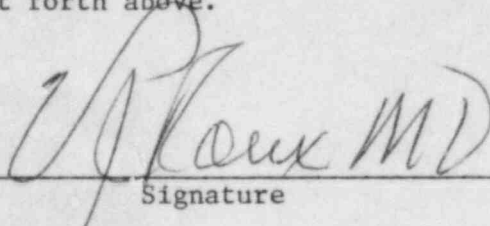
- d. Reestablishment of an individual occupational worker's Investigational Level II to a level above that listed in Table 0-1.

In cases where a worker's or a group of workers' exposures need to exceed Investigational Level II, a new, higher Investigational Level II may be established on the basis that it is consistent with good ALARA practices for that individual or group. Justification for a new Investigational Level II will be documented.

The Radiation Safety Committee will review the justification for and will approve, all revisions of Investigational Level II. In such cases, when the exposure equals or exceeds the newly established Investigational Level II, those actions listed in paragraph 6.c above will be followed.

7. Signature of Certifying Official

I hereby certify that this institution has implemented the ALARA Program set forth above.



Signature

Vincent J. Roux, M.D.

Name

Medical Director

Title

Howard University Hospital  
2041 Georgia Avenue, N.W.  
Washington, D.C. 20060

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