

THE UNIVERSITY OF CHICAGO

RADIATION PROTECTION SERVICE

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CHICAGO · ILLINOIS 60637

(312) 962-6299

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December 23, 1985

Materials Licensing Section
Region III, Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Re: License 12-509-3

Gentlemen:

We respectfully request that by-product material license 12-509-3 be amended to provide for a gamma irradiator containing up to 24,000 (Twenty four thousand)curies of cobalt-60.

The irradiator is manufactured by Atomic Energy of Canada, Ltd, as gammacell, model 220. The irradiator is designed so exposure to the source is impossible under normal conditions of use. The irradiator has been evaluated by NRC and found to be acceptable for general use. A copy of the NRC evaluation of this irradiator is enclosed. The unit will be operated in accord with all conditions specified in the NRC evaluation.

The unit will be used to initiate strand breaks in DNA to study DNA repair mechanisms, to irradiate mammalian cells for survival studies, and to irradiate rodents. This use has been approved by the University Committee on Radiation Hazards.

One of the proposed users of the source has had prior experience with a Cs-137 irradiator and a Co-60 teletherapy at University of Texas Health Science Center and with a Co-60 irradiator at Harvard School of Public Health. The other user has had experience with a Cs-137 irradiator at Cambridge Research Laboratory.

The individuals responsible for use of the irradiator have provided the following training, operating, and emergency procedures that are satisfactory to the committee.

- a. Training. Each person using the unit will be required to read the operation manual supplied by the manufacturer. Other users will be instructed in the proper operation of the unit including a detailed description of the unit and the function of the safety devices. This training will include actions to be taken in case of possible emergencies and their responsibility to report promptly any condition that may lead to exposure to radiation or radioactivity from the source. We believe these subjects are commensurate with potential radiological health protection problems associated with the irradiator. Radiation Protection Service will assign applicants in their responsibility of training other employees using the irradiator.

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b. Emergencies.

Suspected leakage: Evacuate the immediate area and inform Radiation Protection and the supervisor immediately.

Fire: Pull fire alarm and notify Radiation Protection and supervisor immediately. If appropriate, use fire extinguisher located in room to douse the flame.

Tampering by unauthorized personnel: Notify Radiation Protection, supervisor, and Security Dept immediately.

Electrical power failure: The hand crank used to move the sample chamber in case of a power failure will be kept in a readily available place in the irradiator room.

c. Maintenance.

No maintenance will be attempted without written instructions from the manufacturer and approval of Radiation Protection. The door to the room in which the irradiator is located must be locked when unattended.

d. Survey instruments.

The room will be equipped with an ionization type survey instrument and, a geiger counter, and a fire extinguisher.

e. Maintenance and interlock tests.

Maintenance will not be attempted without approval of Radiation Protection. Interlock testing and leak testing will be done by Radiation Protection according to the manufacturer's recommended procedures. Results of maintenance, interlock tests, leak tests, and unusual occurrences will be recorded in a log book kept next to the irradiator.

f. Leak tests.

Radiation Protection will make the necessary leak tests initially and at six month intervals thereafter.

g. Security.

The door to the irradiator room will be locked at all times when an approved user is not present. Only individuals who have been trained to operate the unit will be issued keys to the room and keys to turn on the power to the unit.

h. Minors.

No person under 18 years of age will be permitted in the irradiator room.

i. Structural Considerations.

The irradiator room is in the basement. The floor of the room will be provided with additional bracing to support the 8800 pound weight of the unit. The wall against which the irradiator will be placed will be constructed of eight inches solid concrete blocks to ceiling height. Other surrounding areas include a dark room and mechanical equipment rooms. The subbasement below contains mechanical equipment. The office above is shielded by eight inches of concrete.

j. Occupancy.

No person will be assigned to work full time in the irradiator room. Occupancy is limited to sample preparation, insertion, and removal from the irradiator.

k. Installation.

Upon delivery from AECL, the irradiator will be installed by professional riggers in the presence of individuals responsible for the unit and Radiation Protection personnel.

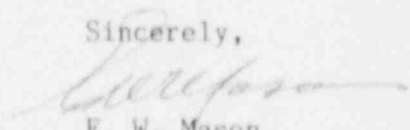
Please note that the Committee on Radiation Hazards has approved the application with the following conditions.

1. Radiation Protection Service will be present during installation.
2. Radiation Protection will make a survey of the area in which the device is located, record the results, and post any signs required.
3. The applicant is prohibited from conducting any maintenance on the device which might expose the source.
4. Radiation Protection Service will regularly monitor the area in which the irradiator is located. We believe quarterly monitoring is adequate for this type of device.

Personnel monitoring devices (film badges) will be issued monthly for the first three months of use. If the cumulative exposures are less than 25% of the radiation protection guides shown in 10CFR20.101, personnel monitoring may be discontinued since such monitoring is not required by 10CFR20.202(a)(1).

Enclosed is a University of Chicago check #41156 for \$120 to cover the license amendment fee for category 3E as specified in 10CFR170. We trust these procedures are satisfactory and will be glad to provide any further information you may need to grant our request.

Sincerely,


E. W. Mason
Director

encl

pc w/o encl: Nathan Sugarman
Dr. Frank Fitch
Walter Massey