

THE UNIVERSITY OF CHICAGO
RADIATION PROTECTION SERVICE
5841 SOUTH MARYLAND AVENUE
CHICAGO · ILLINOIS 60637
(312) 962-6299

U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

August 16, 1985

Gentlemen:

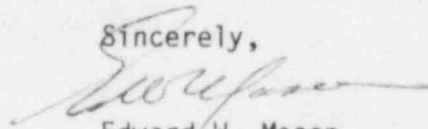
We respectfully request that byproduct material license 12-509-3 be amended to provide for a gamma irradiator containing up to 720 curies of cesium-137.

The irradiator is manufactured by Atomic Energy of Canada, Ltd, as Gammacell 1000 Blood Irradiator model A. The unit will be used by the University of Chicago Blood Bank for irradiation of blood products prior to transfusion. This use has been approved by the University Committee on Radiation Hazards. A copy of the NRC safety evaluation of this irradiator is enclosed. All conditions specified in the evaluation will be complied with.

Also enclosed is a University of Chicago check for \$120.00 to cover the license amendment fee specified in 10CFR170.

We will be glad to provide any additional information you may need to grant our request. We hope that our request can be processed expeditiously since the blood bank now has to purchase irradiated blood at considerable cost.

Sincerely,


Edward W. Mason
Director

encl

pc: M. P. Podiako
Dr. S. T. Shaw
N. Sugarman
W. Massey

Applicant Sy. 3 III
Check No. 833392
Amount/Fee Category 120. (34)
Type of Fee Application fee
Date Check Rec'd 8/29/85

RECEIVED
AUG 21 1985
REGION III

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CONTROL NO. 7 9 6 0 3

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-169-D-160-S

DATE: JUL 22 1983

PAGE 1 OF 4

DEVICE TYPE: Gamma Irradiator

MODEL: Gamma Cell 1000, A, B, C, or D

MANUFACTURER/DISTRIBUTOR:

Atomic Energy of Canada, Ltd.
Commercial Products Division
P.O. Box 6300
Ottawa, Canada k2A3W3

MANUFACTURER/DISTRIBUTOR:

SEALED SOURCE MODEL DESIGNATION:

ORNL-RAMCO-50 or ISO-1000

ISOTOPE: Cesium-137

MAXIMUM ACTIVITY: Up to 3264 curies (see
description)

LEAK TEST FREQUENCY: 6 Months

PRINCIPAL USE: (1) Gamma Irradiator, Category I

CUSTOM DEVICE: ☐ YES ☒ NO

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DEVICE TYPE: Gamma Irradiator

DESCRIPTION:

The Gamma Cell 1000 is a fully self-contained irradiator. The irradiator chamber has a built-in turntable to provide dose uniformity when rotating. The doubly encapsulated sources are permanently fixed and sealed off within the lead shield. The sample chamber is introduced to and removed from the radiation field by turning the rotor 180°. To obtain the dose rates needed by the user, Atomic Energy of Canada, Ltd. loads the Gamma Cell 1000 with the sources and quantities listed below:

Gamma Cell 1000 Model	No. of Sources		No. of sources	
	RAMCO-50	Not to Exceed	ISO-1000	Not to Exceed
A	2 -----	828.0 curies	1 -----	720 curies
B	4 -----	1632.0 curies	2 -----	1440 curies
C	6 -----	2448.0 curies	3 -----	2160 curies
D	8 -----	3264.0 curies	4 -----	2880 curies

LABELING:

The Gamma Cell 1000 is labeled in accordance with the requirements of Section 20.203, 10 CFR Part 20 and with ANSI N433.1, 1977 requirements.

DIAGRAM:

See attachment.

CONDITIONS OF NORMAL USE:

The Gamma Cell 1000 is a low dose rate irradiator designed to irradiate biological or other samples requiring low dose rate, (e.g., blood and blood components to eliminate small lymphocytes, sprout stimulation of seeds and tubers, non-sporulating bacteria and molds -- pasteurization and sterilization, viruses, polymerization, etc.). The irradiator would be located in laboratory environments and be used by trained personnel.

PROTOTYPE TESTING:

The sealed sources used in the Gamma Cell 1000 have passed Special Forms Tests conducted by the manufacturer and supplier Oak Ridge National Laboratory. Furthermore, the device has been in for more than 10 years without any significant problems being reported.

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EXTERNAL RADIATION LEVELS:

Atomic Energy of Canada, Ltd. reports at 5 centimeters from the surface of the radiation shield, the average dose rate will not exceed 0.5 milliroentgens per hour.

QUALITY ASSURANCE AND CONTROL:

Atomic Energy of Canada, Ltd has submitted an acceptable quality assurance and control program. A copy of this is on file with the Material Certification and Procedures Branch.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- o The device shall be distributed only to specific licensees of NRC or an Agreement State.
- o Handling, storage, use, transfer, and disposal, to be determined by the licensing authority.
- o The device shall be leak tested at six month intervals using techniques capable of detecting 0.005 microcuries of removable contamination.
- o This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the NRC.

SAFETY ANALYSIS SUMMARY:

The Gamma Cell 1000 was deemed acceptable for licensing purposes in 1979 by the NRC. At that time, the device was manufactured by Isomedix, Inc. and distributed by Atomic Energy of Canada, Ltd (AECL). AECL will now manufacture and distribute the device. They have not made any significant changes to the source housing. Since the device was previously deemed acceptable for licensing and that the changes made do not alter the safety of the device, we continue to find the Gamma Cell 1000 as acceptable for licensing purposes.

REFERENCES:

The following supporting documents for the Gamma Cell 1000 are hereby incorporated by reference and are made a part of this registry document:

- o Isomedix, Inc. letter dated May 9, 1980 and June 11, 1980, with enclosures thereto.
- o ORNL letter dated June 18, 1980.
- o Atomic Energy of Canada, Ltd. letter dated June 2, 1983 with enclosures thereto.

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SAFETY EVALUATION OF DEVICE

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DEVICE TYPE: Gamma Irradiator

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: JUL 22 1983
JUL 22 1983

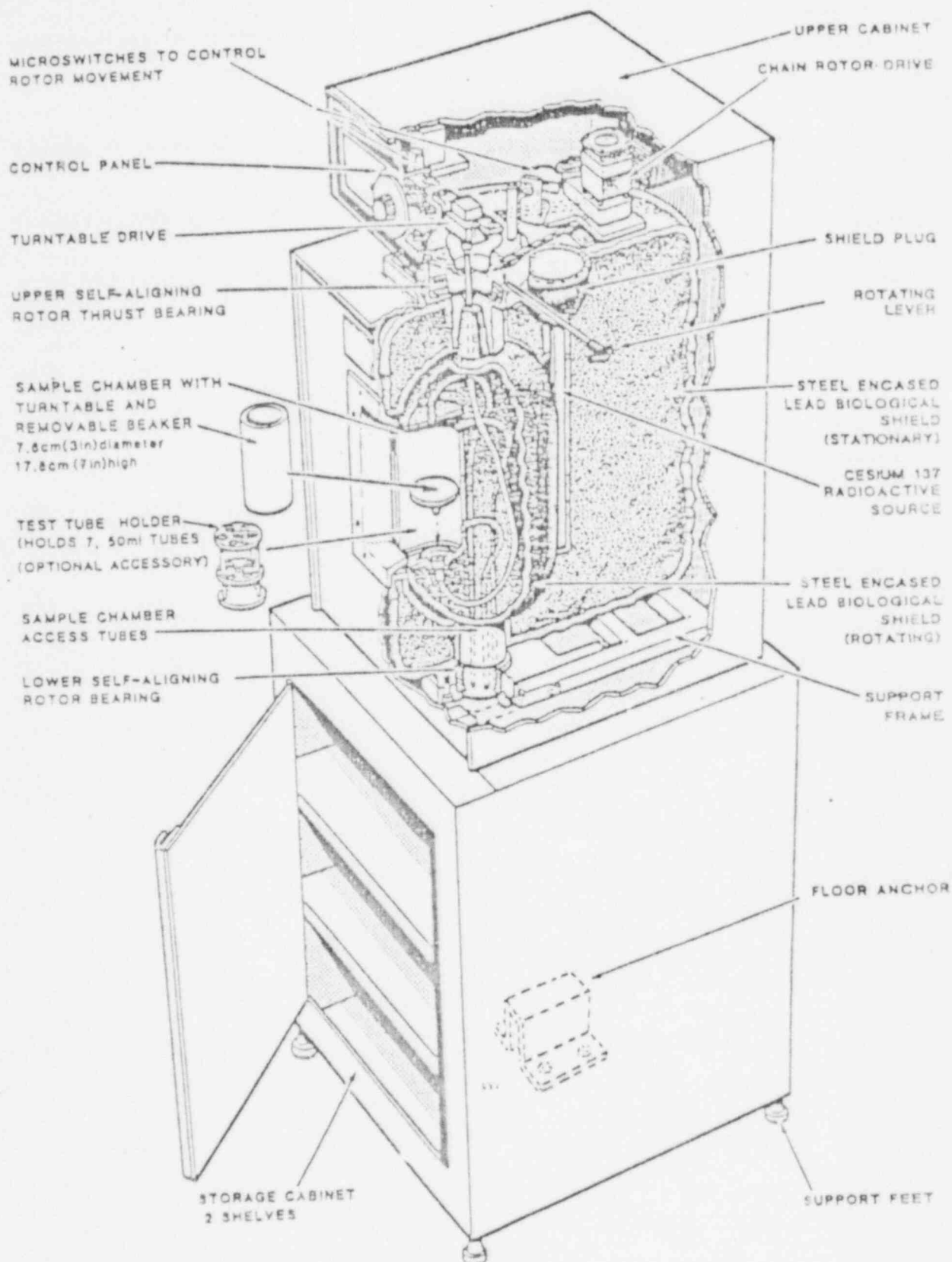
Reviewer:

John B. [Signature]

Date:

Concurrence:

Joseph M. [Signature]



GC-1000 Irradiator