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VIA REGISTERED MAIL

1984 March 8

Mr. Steven L. Baggett
Material Certification and
Procedures Branch
U.S. Nuclear Regulatory Commission
Washington D.C. 20555
U.S.A.

Dear Mr. Baggett:

AECL Gammacell 220 Research Irradiator
Device Registration #NRL69D119U

Our Marketing Division identified a documentation problem which occurred when one of our customers experienced difficulty determining the correct source model numbers when he applied for his license for his new Gammacell 220.

The difficulty arose when it was noticed that the source model numbers specified on the Device Registration listing (NRL69D119U) were Model C-166 (Cobalt pellets) and Model C-167 (Cobalt slugs). This information is correct as of the device registration date (Feb 1969). However, these source models were later superseded by the model C-198 (Cobalt pellets) and model C-185 (Cobalt slugs) in October 1977.

The use of these two new source models was approved by the Commission in October 1977 (reference NRL69S150U and NRL69S151U), following review of detailed submissions by AECL.

We respectfully request that the AECL sealed source models C-185 and C-198 be added to the Device Registration Number NRL69D119U under the heading "Sealed Source Model Designation".

Yours sincerely,

A.W. Tatham
Regulatory Affairs Branch
Quality Assurance Department
Commercial Development Division

/cc

cc. E.F. Ridout
P. Moses

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REG3 LIC30
12-00509-03 PDR

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(Corrected Copy)

NO.: NR169D119U

DATE: February 05, 1969

PAGE 1 OF 3

DEVICE TYPE: Irradiator

MODEL: Gammacell 220

MANUFACTURER/DISTRIBUTOR: Atomic Energy of Canada, Ltd.
Commercial Products
P. O. Box 93
Ottawa, Canada

MANUFACTURER/DISTRIBUTOR:

SEALED SOURCE MODEL DESIGNATION: AECL Model C-166 C-167, C-185, or C-198 source pencils

ISOTOPE: Cobalt-60

MAXIMUM ACTIVITY: 26,400 curies

LEAK TEST FREQUENCY:

PRINCIPAL USE: Gamma Irradiator, Category I

CUSTOM DEVICE: ☐ YES ☒ NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
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DEVICE TYPE: Irradiator

DESCRIPTION:

The Gammacell 220 irradiator is a standard, self-contained floor model unit. Basically, the unit consists of an annular shaped source, a spherically-skewed lead shield around the source, and a long cylindrical drawer free to move vertically through the center of the source annulus. The unit's dimensions are 64" high ("irradiate" position) by 40" wide by 60" long and it weighs 8,250 lbs. The spherically-skewed lead shield provides a minimum of 7" (at the bottom) up to a maximum of 10" (at the top) of shielding toward the outside surfaces. The sample chamber, 6" in diameter by 8 1/2" high, is protected by a lift out closure door and can accommodate liquids, gases, electrical and mechanical connections through spiral (two 7/16" ID & one 5/16" ID) stainless steel access tubes (older models) or a 1-1/4" ID straight access tube (newer models) in the drawer top. The drawer, 59-3/16" in length and 6-1/2" in diameter, consists of an external (access tube) lead shielding plug 4" in diameter by 5-1/4" high, a 13" upper lead shield, the 8-1/2" sample chamber, a 32" lower lead shield, and 7/16" of steel encasement. The sample chamber moves with the drawer through a stroke of 19-5/8" to a position even with the two half collar shield doors. A single 7/16" spiral stainless steel tube passes through the lower lead shield of the sliding drawer for drainage purposes.

The sample chamber moves vertically from the "load" position to the "irradiate" position and back by means of an electrical motor and worm gear reducer through a chain and sprocket drive. The movement to either position does not exceed 7 sec. The position of the sample drawer is controlled by an "up-down" switch, which, if necessary, can override the programming timer.

The irradiator can use up to 48 AECL Model C-166, C-167, C-185, or C-198 source pencils. Pencils are spaced uniformly on a 8-1/4" diameter on a stainless steel source cage 8-13/16" in OD by 8-5/16" high. The unit has been licensed for up to 26,400 curies of cobalt-60.

The irradiator is provided with limit switches and mechanical stops which control and limit movement of the drawer. Three microswitches mounted on the shielding collar ensure that (a) the door to the sample chamber is properly in place, (b) the locking ring to this door is snapped into position and (c) both half doors of the collar are closed prior to starting of the motor. The lead shielding plug covering the straight access tube is mechanically interlocked so that it cannot be opened with the drawer in the "irradiate" position and electrically interlocked so that the drawer cannot be lowered if this plug is not in its proper position. A

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE
(Corrected Copy)

NO.: NR1690119U

DATE: February 05, 1969

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DEVICE TYPE: Irradiator

DESCRIPTION (CONT'D):

spring-loaded plunger operated by a solenoid located at the base of the main shield moves under the drawer in the "load" position to prevent the drawer from moving down unexpectedly. In the event of power failure the drawer can be returned to the "load" position by means of an emergency hand crank.

EXTERNAL RADIATION LEVELS:

The irradiator loaded with 11,520 curies was surveyed by the manufacturer and found to have at 1 meter from the source an average radiation level of 1.2 mr/hr and a maximum of 2.2 mr/hr (above top of drawer) with the source drawer in the "irradiate" position. The highest reading at 5 cm from the surface of the unit for this position was 10 mr/hr just above the collar and drawer on the left side. With the drawer in the "load" position the manufacturer found the unit to have at 1 meter from the source an average radiation level of 1.1 mr/hr and a maximum of 7 mr/hr (above top of drawer). The highest reading at 5 cm from the surface of the unit for this position was 10 mr/hr just above the collar and drawer on the left side. For a unit loaded with 26,400 curies of cobalt-60, a survey was made at 2" from the surface of the unit with the drawer in the "irradiate" position and radiation levels of 19 mr/hr at the front of the irradiator and 30 mr/hr at the top of the unit near the drawer were measured.

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

An instruction manual entitled, "Instruction Manual, Gammacell 220", is available and can be obtained from the manufacturer. It contains, in general, a description of the unit, a discussion of the safety features, proposed operating procedures, general maintenance procedures, fault location procedures, leak test procedures, and installation procedures.

The instruction manual described above may be referenced by the applicant with respect to the operating procedures he plans to follow during use of the unit, in lieu of providing his own. A license condition requesting a radiation survey of this unit and a report of the results is considered optional.

ISSUING AGENCY:

U.S. Atomic Energy Commission

CONTROL NO. 80400