OCT 07 1982

FCML:JHP
(12247)
030-12438

Department of the Army
Commander, U.S. Army Material Development
and Readiness Command (DARCOM)
ATTN: DRCSF-P
5001 Eisenhower Avenue
Alexandria, VA 22333

Gentlemen:

This refers to your application dated March 12, 1982, for renewal of License No. 19-17250-01, Harry Diamond Laboratories, Adelphi, Maryland. The following additional information is needed in order to further process your application.

To assist you in providing this information, we have enclosed a copy of Regulatory Guide 10.7, "GUIDE FOR THE PREPARATION OF APPLICATIONS FOR LICENSES FOR LABORATORY AND INDUSTRIAL USE OF SMALL QUANTITIES OF BYPRODUCT MATERIALS." You should refer to the appropriate sections of this guide and provide the following additional information:

1. Instrument Calibration Procedures.

   Your application states that instrument calibration will be performed by Rad Services, Inc., yet Supplement Nos. 1 and 2 indicate that you will perform in-house calibration.

   If you intend to perform in-house calibration of instruments used to make quantitative radiation measurements, you must provide complete calibration procedures as specified in Regulatory Guide 10.7, Items 10 and 11. Please include specific procedures for controlling access to unrestricted areas used for calibration.

2. Radiation Survey Program.

   The attachment for Item 15 of your application provides general information concerning radiation protection. However, we will need additional information including:

   a. A copy of HDLM 385-20 (if this has previously been submitted for another license, please provide the license number).

b. Please specify types, frequencies, and methods of radiation surveys.

c. Written instructions to personnel regarding use of radioactive material.

d. For leak tests procedures, please provide the information specified in Items 15(c)(4) and (5) of Regulatory Guide 10.7.

3. Personnel Exposures.

The ALARA concept is applicable to personnel exposures. Please provide imformation to show that you will maintain personnel exposures as low as is reasonably achievable. Refer to enclosed Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable" for more information. Please note that we will accept your program as meeting the ALARA concept if you submit information to us showing that immediate and appropriate corrective actions are taken whenever the radiation exposure to an individual exceeds 10 percent of the limits specified in 10 CFR Part 20.

We will continue our review upon receipt of the above information. Please reply in duplicate and refer to Control No. 12247.

Sincerely,

J. W. Patterson
Material Licensing Branch
Division of Fuel Cycle and
Material Safety

Enclosures:
1. Regulatory Guide 10.7
2. Regulatory Guide 8.10

CRESS:SS FCML
5520 JPatterson:clf
9/30/82 9/ /82

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

3010-107

UNITED STATES GOVERNMENT

Memorandum

TO : Files

DATE: July 19, 1968

FROM : Thomas W. Brockett, Inspection Specialist
(Health Physicist)
Division of Compliance

SUBJECT: DEPARTMENT OF THE ARMY
HARRY DIAMOND LABORATORIES
WASHINGTON, D. C.
LICENSE NOS. 8-2534-6; -8; SNM-348
INSPECTION CONDUCTED ON JULY 9, 1968

Inspector's Evaluation

With the exception of the work being conducted under the reactor program at Diamond Ordnance Radiation Facility, very little is being made of licensed radioactive materials authorized under other licenses issued to this command. Three licensed programs (8-2534-5; -10; and -11) have been closed out and the materials possessed under these licenses have been disposed of to the U. S. Army Edgewood Facility. Most of the material presently possessed under the other licenses is not being used and is stored. No items of noncompliance or health and safety items were noted and clear Forms AEC-591 were issued.

It is recommended that the imspection interval for these licenses be increased by 12 months and that the next inspection be due in three years.

J R Roeder August 14, 1968

For back up data
Re License # 8-2534

0390

AUG 19 1982

Reg I

FC4LB:JH

Department of the Army
Commander
U.S. Army Material Development and
Readiness Command (DARCOM)
ATTN: DRCSF-P
5001 Eisenhower Avenue
Alexandria, VA 22333

Docket No. 030-12438

License No. 19-17258001

Control No. 12247

SUBJECT: LICENSE RENEWAL APPLICATION

Gentlemen:

This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

John W. N. Hickey
Material Licensing Branch
Division of Fuel Cycle and
Material Safety

JHickey/sc
8/ /82

8305040408

FORM NRC-313 I (3-80)
10 CFR 30

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

See attached instructions for details.

Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.

1. APPLICATION FOR: *(Check and/or complete as appropriate)*

	a. NEW LICENSE
	b. AMENDMENT TO: LICENSE NUMBER
X	c. RENEWAL OF: LICENSE NUMBER NRC 19-17250-01

2. APPLICANT'S NAME *(Institution, firm, person, etc.)*

Harry Diamond Laboratories

TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
202-394-2218

3. NAME AND TITLE OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION

Michael J. Borisky (RPO)

TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
202-394-2218

4. APPLICANT'S MAILING ADDRESS *(Include Zip Code)*
(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)

Harry Diamond Laboratories
ATTN: DELHD-SA
2800 Powder Mill Road
Adelphi, MD 20783

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED *(Include Zip Code)*

Harry Diamond Laboratories
ATTN: DELHD-SA
2800 Powder Mill Road
Adelphi, MD 20783

(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL
(See Items 16 and 17 for required training and experience of each individual named below)

	FULL NAME	TITLE
a.	Klaus G. Kerris	Physicist
	Charles C. Casaer	Co-60 Irradiator Operator
b.	Perry Sarigianis	Co-60 Irradiator Operator
c.	Michael J. Borisky	Radiation Protection Officer

7. RADIATION PROTECTION OFFICER
Michael J. Borisky (RPO)
James M. McGarrity (Alternate RPO)

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.

8. LICENSED MATERIAL

LINE NO.	A ELEMENT AND MASS NUMBER	B CHEMICAL AND/OR PHYSICAL FORM	C NAME OF MANUFACTURER AND MODEL NUMBER *(If Sealed Source)*	D MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
(1)				
(2)		See Supplement #1		
(3)				
(4)				

	E DESCRIBE USE OF LICENSED MATERIAL
(1)	See Supplement #1
(2)	
(3)	
(4)	

FORM NRC 313 I (3-80)

9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	See Supplement #2		
(2)			
(3)			
(4)			

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	See Supplement #3					
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☒ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY – quarterly

Rad Services Inc., 3527 Whiskey Bottom Rd., P.O. Box 536, Laurel, MD 20707

☐ b. CALIBRATED BY APPLICANT

Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
☒ (1) FILM BADGE ☐ (2) THERMOLUMINESCENCE DOSIMETER (TLD) ☐ (3) OTHER (Specify): _____	US Army Ionizing Radiation Dosimetry Center, Lexington Blue Grass Depot Activity, Lexington, KY 40511	☒ MONTHLY ☐ QUARTERLY ☐ OTHER (Specify):

13. FACILITIES AND EQUIPMENT (Check were appropriate and attach annotated sketch(es) and description(s).

☐ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.

☒ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.

☒ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC. See Supplement #2

☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

See Supplement #4

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

. Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. RADIATION PROTECTION PROGRAM. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures *(if needed)*, day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.

See Supplement #5

16. FORMAL TRAINING IN RADIATION SAFETY. Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.

See Supplement #6

a. Principles and practices of radiation protection.

b. Radioactivity measurement standardization and monitoring techniques and instruments.

c. Mathematics and calculations basic to the use and measurement of radioactivity.

d. Biological effects of radiation.

17. EXPERIENCE. Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

See Supplement #7

18. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

WARNING.—18 U.S.C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

a. LICENSE FEE REQUIRED *(See Section 170.31, 10 CFR 170)*	b. CERTIFYING OFFICIAL *(Signature)* Allan R. Burke 28 MAR [illegible]
	c. NAME *(Type or print)* ALLAN R. BURKE, COL, OrdC
(1) LICENSE FEE CATEGORY:	d. TITLE Commanding
(2) LICENSE FEE ENCLOSED: $	e. DATE

SUPPLEMENT #1

Item 8, Form NRC 313i, Licensed Material

Element and Mass Number	Chemical and/or Physical Form	Manufacturer and Model #	Max Activity and Max Activity per Source At Any One Time
Cobalt-60	Sealed Sources		Max 245 mCi Total
	3 each	Tracerlab	12 mCi each
	1 each	Tracerlab	15 mCi each
	1 each	Tracerlab	1 mCi each
Cobalt-60	Sealed Source 1 each	Nuclear Chicago Style 850213	2.0 Ci each
Cesium-137	Sealed Source 1 each	Tracerlab	15 mCi each
Cesium-137	Sealed Source 1 each	Nuclear Chicago	1.0 Ci each

The sources will be used for constancy, calibration, and response checks of radiation detecting instruments. Sources will be stored as stated in Item 9 (Supplement #2) and Item 13 (Supplement #2).

As there are remote area monitors permanently located within the Harry Diamond Laboratories Co^{60} Irradiator Facility (NRC Lic 19-17250-05), 3 sources are stored and used within this facility to conduct calibration and constancy checks on these monitors (See Supplement #2, Figures 1-4).

SUPPLEMENT #2

Item 9, Form NRC 313i, Storage of Sealed Sources
Item 13, Form NRC 313i, Facilities and Equipment

HDL Control Number	Container or Device In Which Sealed Source Will be Stored or Used	Manufacturer	Model #
A, 12 mCi Co^{60}	Lead Pig, 6" high by 4" diameter	Not Indicated	Not Indicated
B, 1 mCi Co^{60}	Lead pig, as E, below	Tracerlab	Not Indicated
C, 12 mCi Co^{60}	Lead pig, 6½" high by 4" diameter	Not Indicated	Not Indicated
D, 12 mCi Co^{60}	Lead pig, 6½" high by 4" diameter	Not Indicated	Not Indicated
E, 15 mCi Co^{60}	Lead pig, 4½" high by 4" diameter inside box, 9½" x 7" x 7"	Tracerlab	Not Indicated
F, 2 Ci Co^{60}	Lead pig, See Figures 1 and 2	Harry Diamond Laboratories	N/A
G, 15 mCi Cs^{137}	Lead pig, 6" x 6" x 6"	Not Indicated	Not Indicated
H, 1 Ci Co^{60}	Lead pig, See Figures 1 and 2	Harry Diamond Laboratories	N/A

1. Sealed sources will be stored in Radioactive Materials Storage area or Cobalt-60 exposure room as illustrated in Figures 3 and 4. Both areas are specifically designed to ensure that radioactive material contained therein do not create "restricted areas" at points exterior to their walls, floor, or ceiling. The doors to both the areas are kept locked. Access to the Rad Storage Area will be limited to the Radiation Protection Officer. Access to the sources in the Co^{60} Facility will be limited to K. Kerris, P. Sarigianis, C. Casaer, and M. Borisky. Both storage areas are within Building 504, on HDL property which is surrounded by a guarded chainlink fence.

2. When necessary, a special area will be set up for the purpose of using the sources to calibrate radiation detection instrumentation. The area will have limited access and will be posted with the required radiation warning signs. Persons conducting calibration procedures will be equipped with survey instruments and will wear film badges. Forcepts, tongs, and special remote handling tools are available when needed, varying in length from 12 inches to 48 inches.

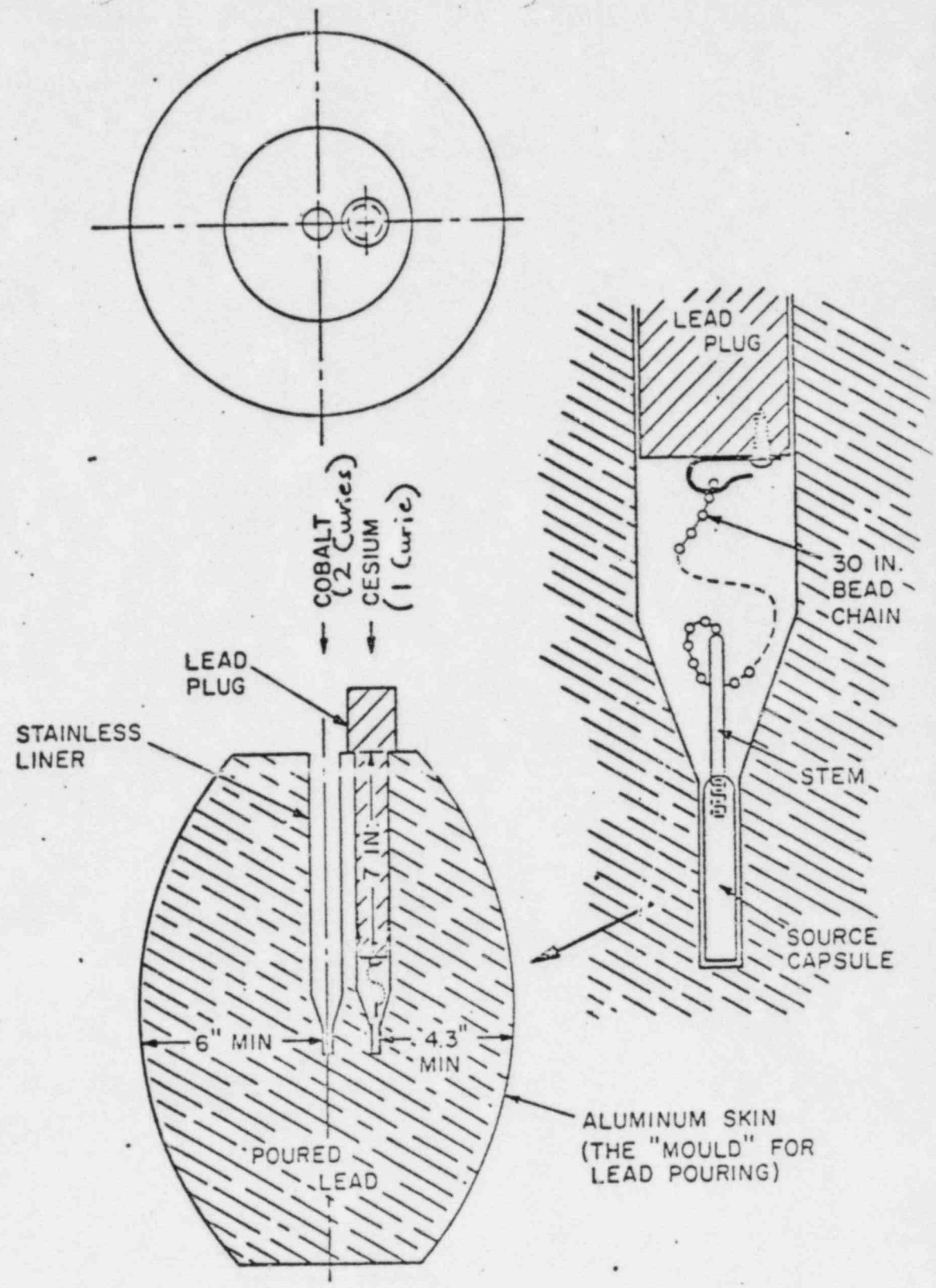


Figure 1. Storage container.

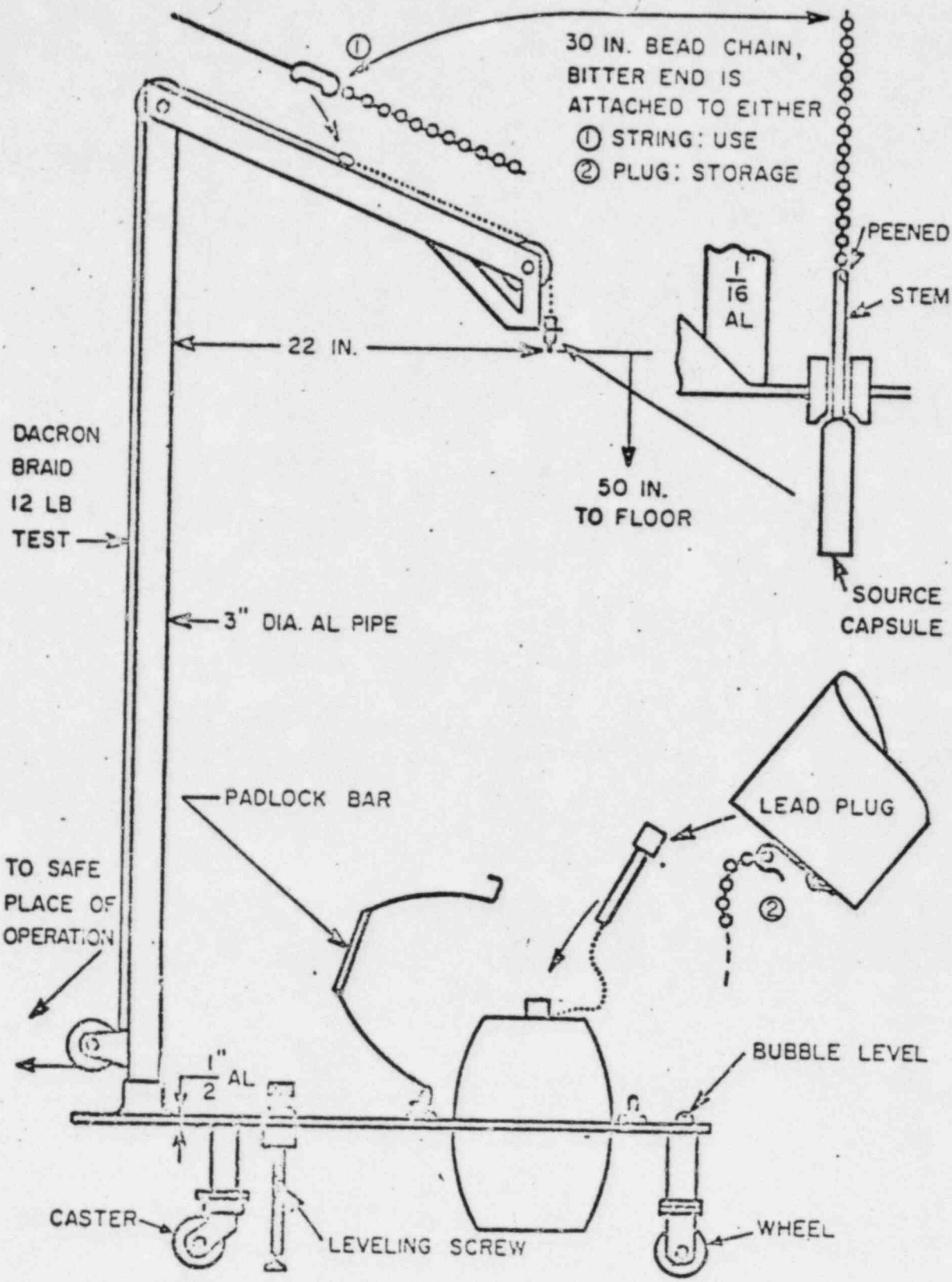
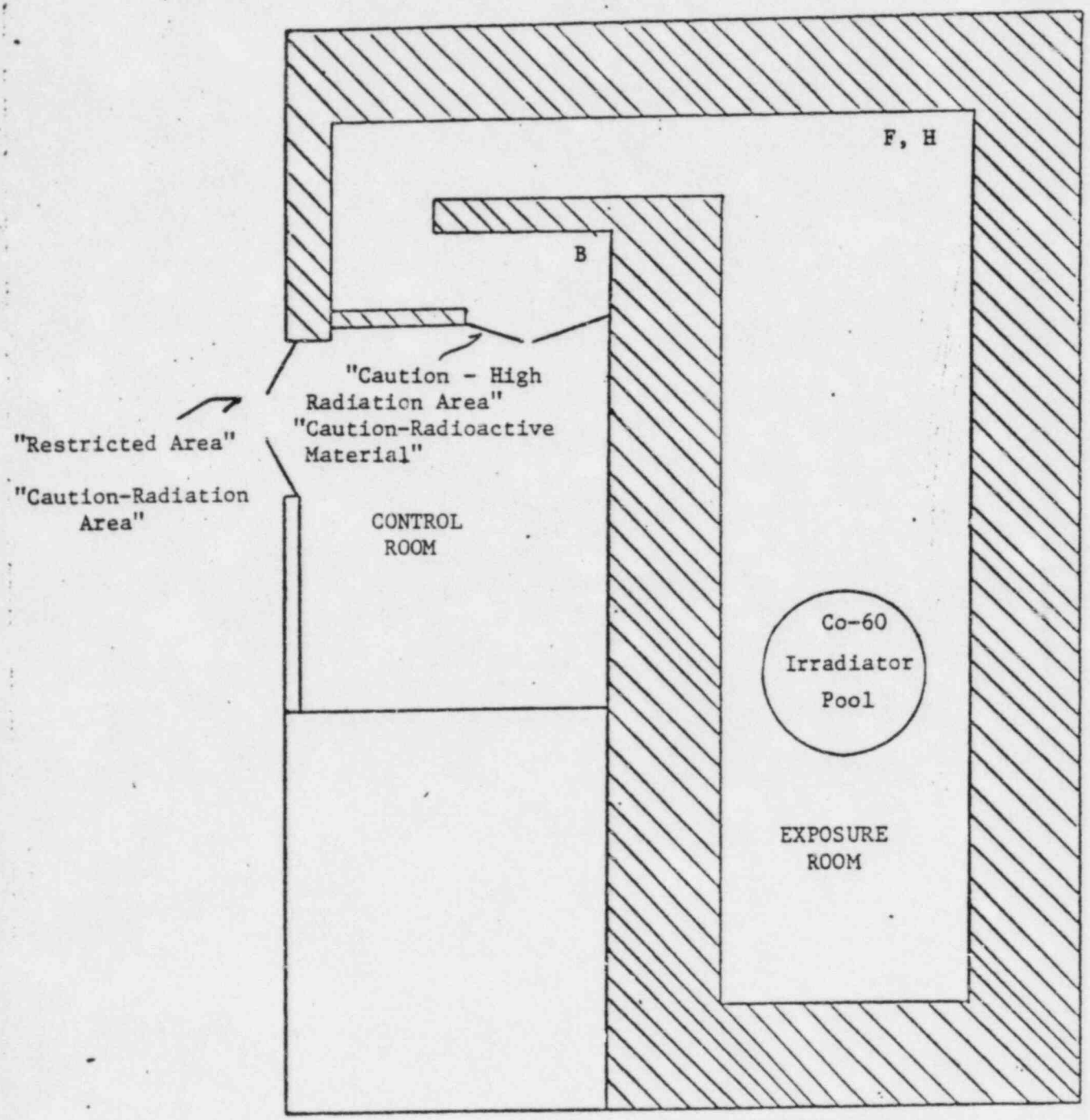


Figure 2. Diagram showing storage-exposure assembly.

HDL Cobalt-60 Irradiator Facility
(NRC Lic 19-17250-05)



HDL Control #	Sealed Source	Manufacturer
B	1 mCi, Co^{60}	Tracerlab
F	2 Ci, Co^{60}	Nuclear Chicago
H	1 Ci, Co^{60}	Nuclear Chicago

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Figure 3

Radioactive Material Storage Facility

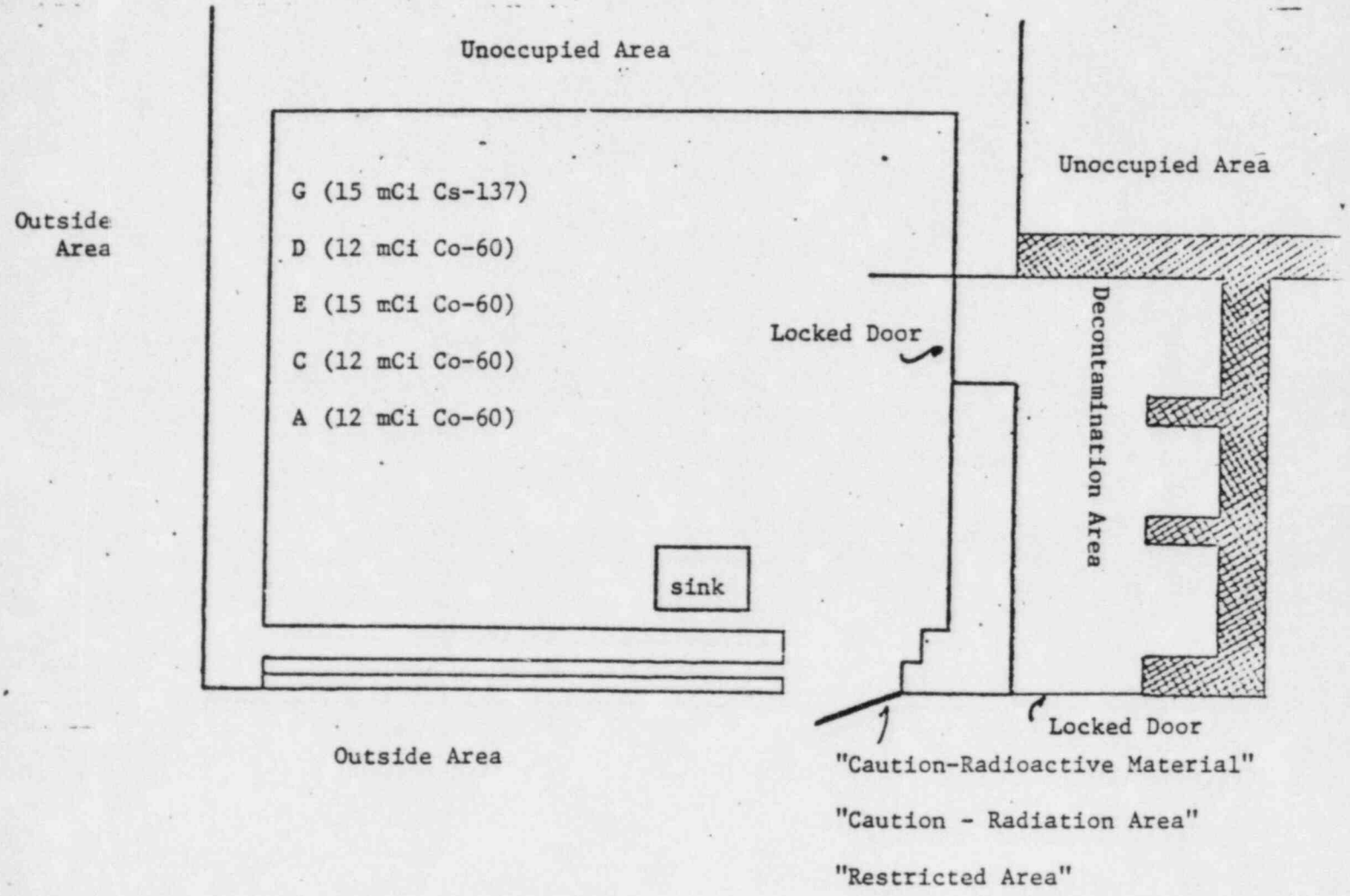

Figure 4

SUPPLEMENT #3

Item 10, Form NRC 313i, Radiation Detection Instruments.

Type	Manufacturer	Model #	No. Avail	Radiation Detected	Sensitivity Range
Proportional	Nuclear Measurements Corp.	PC-4	1	Alpha, beta, gamma	0-3.5x10^6 cpm
G-M	Ludlum Measurements Inc.	Model 2	2	Beta, gamma	0.1-50 mR/hr
G-M	Victoreen	Thyac II, Model 489	1	Alpha, beta, gamma	0.05-20 mR/hr 50-800 cpm
G-M	Victoreen	Thyac III, Model 490	1	Beta, Gamma	0.05-200 mR/hr
Ion Chamber	Victoreen	Model 440-RF	1	Gamma	1-300 mR/hr
Scintillation	Eberline Inst.	Gadora-1B	1	Gamma	1-1000 R/hr
Ion Chamber	Nuclear Chicago	Model 2592	1	Gamma, beta	0.5-1000 mR/hr 0-10 MR
G-M	Eberline Inst.	Teletector 6112B	2	Gamma, beta	0.01-10^6 mR/hr

SUPPLEMENT #4

Item 14a. Form NRC 313i, Waste Disposal

Waste disposal will be handled through the U. S. Army Armament Material Readiness Command, Rock Island, IL, in accordance with the procedures delineated in Army Regulation 755-15, "Disposal of Unwanted Radioactive Material".

SUPPLEMENT #5

Item 15, Form NRC 313i, Radiation Protection Program

The use of subject material will be conducted IAW the provisions of HDL Memorandum 385-20, Ionizing Radiation Protection Program, 24 March 1980. HDLM 385-20 provides for the safe procurement, use, storage, transport, and disposal of ionizing radiation sources at Harry Diamond Laboratories. HDLM 385-20 is equal to or more restrictive than applicable NRC and Army regulations.

IAW HDLM 385-20, there is in HDL a Radiation Control Committee composed of the Radiation Protection Officer, Chief of the Safety Office, a representative of the administrative office, and several technical members trained and experienced in the use of radioactive materials. The use of subject material will be under the cognizance of this Committee.

The sources will be leak tested at intervals not to exceed 6 months under the direction of the HDL Radiation Protection Officer. The leak test will be conducted in one of the following ways:

a. The source will be wiped with a filter paper (or the filter paper will be wiped with the source) and the filter paper will be counted in an internal gas-flow proportional counter.

b. The source will be swabbed with a piece of cotton, perhaps with a suitable solvent, and the cotton swab will be counted in an internal gas-flow proportional counter.

c. A piece of masking tape may be folded, sticky surface out, around a dowel or paddle. The surface will be swabbed, the tape cut away from the dowel and attached to the inside bottom of a planchet for counting in an internal gas-flow proportional counter.

If a source should need service, maintenance or repair, it will be returned to the manufacturer or transferred to a vendor authorized to repair these sources IAW applicable NRC and Army regulations. Disposal of sources will be conducted as stated in Item 14.

Responsibility of the Radiation Protection Officer includes administration of the HDL Radiation Protection Program, ensuring that operations and facilities incorporate NRC and Army standards, conducting periodic radiation protection surveys at HDL facilities and operation where ionizing radiation is produced, ensuring that radiation detection equipment is maintained in good condition and calibrated at periods not to exceed 90 days, monitoring the shipment and transfer of radiation sources and personally supervising preparation and shipment, coordinating with laboratory employees and their supervisors to ensure that radiation workers are sufficiently trained to perform safely, ensuring that monthly film badge service is provided, and reviewing and recording employee exposures on a monthly basis.

SUPPLEMENT #6

Item 16, Form NRC 313i, Formal Training in Radiation Safety

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FORMAL COURSE
Klaus G. Kerris (Physicist)				
a. Principles	UCLA	3 years	Yes	Yes
	Hughes Aircraft Co	11 years	Yes	No
	Harry Diamond Labs	11 years	Yes	No
b. Measurements	UCLA	3 years	Yes	Yes
	Hughes Aircraft Co	11 years	Yes	No
	Harry Diamond Labs	11 years	Yes	No
c. Mathematics	Ohio State University	2 years	No	Yes
	UCLA	4 years	Yes	Yes
	Hughes Aircraft Co	11 years	Yes	No
	Harry Diamond Labs	11 years	Yes	No
d. Biological	None			
Charles C. Casaer (Chief Operator, Cobalt-60 Irradiator)				
a. Principles	Harry Diamond Labs	14 years	Yes	No
b. Measurements	Harry Diamond Labs	14 years	Yes	No
c. Mathematics	Harry Diamond Labs	14 years	Yes	No
d. Biological	Harry Diamond Labs	11 years	Yes	No
Perry Sarigianis (Alternate Operator, Cobalt-60 Irradiator)				
a. Principles	Harry Diamond Labs	1½ years	Yes	No
	The Martin Co	3 months	Yes	No
	Allis Chalmers Co	2 months	Yes	No
b. Measurements	Harry Diamond Labs	1½ years	Yes	No
	The Martin Co	3 months	Yes	No
	Allis Chalmers Co	2 months	Yes	No
c. Mathematics	The Martin Co	3 months	Yes	No
	Allis Chalmers Co	2 months	Yes	No
d. Biological	The Martin Co	3 months	Yes	No
	Allis Chalmers Co	2 months	Yes	No

Supplement #6, Item 16, Form NRC 313i, Formal Training in Radiation Safety continued:

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FORMAL COURSE
Michael J. Borisky (Radiation Protection Officer)				
a. Principles	Univ of Maryland	1½ years	No	Yes
	USA Chemical School	1 month	No	Yes
	USA, Ft Meade, MD	1 year	Yes	No
	Harry Diamond Labs	10 months	Yes	No
b. Measurement	Univ of Maryland	1½ years	No	Yes
	USA Chemical School	1 month	No	Yes
	USA, Ft Meade, MD	1 year	Yes	No
	Harry Diamond Labs	10 months	Yes	No
c. Mathematics	Univ of maryland	2 years	No	Yes
	USA Chemical School	1 month	No	Yes
	USA, Ft Meade, MD	1 year	Yes	No
	Harry Diamond Labs	10 months	Yes	No
d. Biological	Univ of Maryland	4 years	No	Yes
	USA Chemical School	1 month	No	Yes
James M. McGarrity (Alternate Radiation Protection Officer)				
a. Principles	Univ of Maryland	4 years	No	Yes
	Univ of Maryland	1 year	Yes	No
b. Measurement	Univ of Maryland	3 years	No	Yes
	Univ of Maryland	1 year	Yes	No
c. Mathematics	Harry Diamond Labs	9 years	Yes	No
	Univ of Maryland	4 years	No	Yes
d. Biological	Harry Diamond Labs	8 years	Yes	No
	Univ of Maryland	1 year	Yes	No

SUPPLEMENT #7

Item 17, Form NRC 313i, Expetience

KLAUS G. KERRIS (Physicist)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Cobalt-60	39,448 Ci	Harry Diamond Labs	8 years	Facility Supervisor of a Co-60 Water-Wel Irradiator
Sodium-22	Microcuries	UCLA	3 years	Spectrometry
Cobalt-60	7,000 Ci	Hughes Aircraft Co	11 years	Radiation Effects Study
Zinc-63	Microcuries	UCLA	3 years	Spectrometry
Strontium-90	Microcuries	Hughes Aircraft Co	11 years	Instrument Calibration
Cesium-137	Microcuries	UCLA	3 years	Spectrometry

Mr. Kerris was employed by UCLA as a Research Assistant for 3 years. During that time, he assisted in the development and construction of a 50 MeV proton cyclotron. He was also involved in the operation of the 18 MeV proton cyclotron and used various small sources for beta and gamma spectrometry and instrument calibration.

At Hughes Aircraft Company, he participated in the design of several linear electron accelerators. He was extensively involved in experiments using a 10 MeV linear electron accelerator, a 1 MeV Electron Beam Generator, and a 7 kCi Cobalt-60 source.

At Harry Diamond Laboratories, he has been in charge of dosimetry measurements at Aurora, a 10 MeV pulsed bremsstrahlung generator. In addition, he has functioned as Facility Supervisor of the HDL Cobalt-60 Water-Well Irradiator for the past 8 years, and the Aurora pulse brehmsstrahlung facility for 6 months.

CHARLES C. CASAER (Chief Operator, Cobalt-60 Irradiator)

Cobalt-60	1 Ci	Harry Diamond Labs	11 years	In-Air Instrument Calibration
Cobalt-60	25000 Ci	Harry Diamond Labs	2½ years	In-Air Radiation Effects Testing

In addition, Mr. Casaer has been Chief Operator of the Pulsed X-ray Generator (HIFX) at HDL for the past 14 years. His duties in this position involved the use of GM, Scintillation, and T.L.D. instrumentation for general radiation surveys, remote area monitors, and radiation effects dosimetry. He has also completed a 48-hour course of instruction and training in operation of the HDL Cobalt-60 Facility for in-air irradiations. Instruction and supervision was provided by Mr. Klaus Kerris, Supervisor of the Cobalt-60 Facility.

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Item 17, Form NRC 313i, Experience continued

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
PERRY SARIGIANIS (Alternate Operator, Cobalt-60 Irradiator)				
Cobalt-60	20,000 Ci	Harry Diamond Labs	1½ years	Irradiator
Cf 252	90 ug	USGS	10 months	Activation Analysis
PuBe		Allis Chalmers Co	3 years	Detector Calibration
Cs137		Allis Chalmers Co	3 years	" "
Cs137		USGA	1 year	" "
Cobalt-60	10 Ci	Allis Chalmers Co	4 years	" "

Furthermore, Mr. Sarigianis has been Senior Technician for the 10 MeV, pulsed bremsstrahlung generator (Aurora) at Harry Diamond Labs for 11 years. His duties included instrumentation control and electromechanics. He has also completed a two day course of instruction and training at the HDL Cobalt-60 Facility for in-air irradiation. Instruction and supervision was provided by Mr. Klaus Kerris, Supervisor of the Cobalt-60 Facility and approved by the Ionizing Radiation Committee at Harry Diamond Laboratories.

MICHAEL J. BORISKY (Radiation Protection Officer)				
Sr-Yt^{90}	400 mCi	Ft Meade, MD	1 year	Calibration
Pu-239	40 uCi	Ft Meade, MD	1 year	Calibration
Cs-137	10 mCi	Ft Meade, MD	1 year	Densometer
Am-241	60 mCi	Ft Meade, MD	1 year	Densometer
H-3	10 Ci	Ft Meade, MD	1 year	Self Luminous Devices
Ra-226	Microcuries	Ft Meade, MD	1 year	" "
Co-60	15,020 Ci	Harry Diamond Labs	10 months	Irradiator
JAMES M. McGARRITY (Alternate RPO)				
Cobalt-60	5,000 Ci	Univ of Maryland	2 years	Calibration and Research
Cobalt-60	40,000 Ci	Harry Diamond Labs	10 years	Radiation Effects Studies
Strontium-90	Several mCi	Harry Diamond Labs	8 years	Instrument Calibration
Cesium-137	Several mCi	Harry Diamond Labs	8 years	Instrument Calibration
PuBe Neutron Source	1 Ci	Univ of Maryland	4 years	Instrument Calibration and Sub-critical Assembly

In addition, as a graduate assistant and reactor staff member for 2 years at the University of Maryland, Dr. McGarrity assisted as an instructor in courses on Reactor Technology which included Health Physics as well as reactor operations. Also, he has had 10 years experience at the HDL Triga Reactor Facility (DORF) as Reactor Staff Physicist, advising the physicist in charge on matters of operation and safety. His work at the University of Maryland included 5 years experience with a PS-100, 500 KeV Van de Graff accelerator. Dr. McGarrity also has 6 years of experience conducting radiation effects studies using the HDL HIFX flash X-ray facility.

17207

Army

22 JAN 1981

DELHD-SA

SUBJECT: Request for Amendment No 04 to NRC Byproduct Material License No. 19-17250-01 - Harry Diamond Laboratories

THRU: Commander
US Army Electronics Research and Development Command
ATTN: DRDEL-SS
2800 Powder Mill Road
Adelphi, Maryland 20783

Commander
US Army Materiel Development and Readiness Command
ATTN: DRCSF-P
5001 Eisenhower Avenue
Alexandria, Virginia 22333

TO: US Nuclear Regulatory Commission
Washington, DC 20555

1. a. Request the removal of Paul A. Caldwell, Chief, Branch 290; Walter E. Biesieler, Physicist-in-Charge (DORF); and James E. Stafford, RPO, from subject NRC License, Item 4, Individual Users, Form AEC-313.

b. Amend subject NRC License to include Klaus G. Kerris, Facility Supervisor; Charles C. Casaer, Chief Operator of Cobalt-60 Irradiator; and Perry Sarigianis, Alternate Operator of Cobalt-60 Irradiator as Individual Users, Item 4, Form AEC-313.

c. Supplement #1, Inclosure 1, is the resume of Training and Experience of Each Individual Named at para 1b, Item 8, Form AEC-313.

d. Supplement #2, Inclosure 2, is the description of Experience With Radiation for Each Individual Named at para 1b, Item 9, Form AEC-313.

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8103130267

22 JAN 1981

DELHD-SA

SUBJECT: Request for Amendment No 04 to NRC Byproduct Material License No. 19-17250-01 - Harry Diamond Laboratories

2. a. Request the removal of the following Radiation Detection Instruments, Item 10, Form AEC-313:

TYPE OF INSTRUMENT

1. Baird Atomic Model 135 Scaler-Timer with Shield and End Window G-M Tube
2. Eberline E-120 Geiger Counter
3. Eberline E-400 Geiger Counter
4. Johnson, GSM-5 Survey Meter, GM Tube
5/ Nuclear Chicago, 2586 Ionizing Chamber
6. Nuclear Chicago, 2650 GM Tube
7. Tele Tester, 6112 GM Tube Survey Meter

b. Amend subject NRC License to include the Radiation Detection Instruments, Item 10, Form AEC-313 at Supplement #3, Inclosure 3.

ORIGINAL SIGNED BY

3 Incl
as

W. R. BENOIT
COL, TC
Commanding

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SUPPLEMENT #1

Item 4, Form AEC-313 (See Item 8 and Item 9)

Item 8, Form AEC-313, Training of Individual Users

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FORMAL COURSE
Klaus G. Kerris (Facility Supervisor)				
a. Principles	UCLA	5 years	Yes	Yes
	Hughes Aircraft Co	11 years	Yes	No
	Harry Diamond Labs	4 years	Yes	No
b. Measurements	UCLA	5 years	Yes	Yes
	Hughes Aircraft Co	11 years	Yes	No
	Harry Diamond Labs	4 years	Yes	No
c. Mathematics	Ohio State University	2 years	No	Yes
	UCLA	4 years	Yes	Yes
	Hughes Aircraft Co	11 years	Yes	No
	Harry Diamond Labs	4 years	Yes	No
d. Biological	Harry Diamond Labs	4 years	Yes	No
Charles C. Casaer (Chief Operator, Cobalt-60 Irradiator)				
a. Principles	Harry Diamond Labs	13 years	Yes	No
b. Measurements	Harry Diamond Labs	13 years	Yes	No
c. Mathematics	Harry Diamond Labs	13 years	Yes	No
d. Biological	Harry Diamond Labs	10 years	Yes	No
Perry Sarigianis (Alternate Operator, Cobalt-60 Irradiator)				
a. Principles	The Martin Co	3 months	Yes	No
	Allis Chalmers Co	2 months	Yes	No
b. Measurements	The Martin Co	3 months	Yes	No
	Allis Chalmers Co	2 months	Yes	No
c. Mathematics	The Martin Co	3 months	Yes	No
	Allis Chalmers Co	2 months	Yes	No
d. Biological	The Martin Co	3 months	Yes	No
	Allis Chalmers Co	2 months	Yes	No

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SUPPLEMENT #2

Item 4, Form AEC-313 (See Item 8 and Item 9)

Item 9, Form AEC-313, Experience with Radiation by Individual Users

Klaus G. Kerris (Facility Supervisor)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Cobalt-60	39,448 Ci	Harry Diamond Labs	1 year	Facility Supervisor of a Cobalt-60 Water-Well Irradiator
Sodium-22	Microcuries	UCLA	3 years	Spectometry
Cobalt-60	7000 Ci	Hughes Aircraft Co	11 years	Radiation Effects Study
Zinc-63	Microcuries	UCLA	3 years	Spectometry
Strontium-90	Microcuries	Hughes Aircraft Co	11 years	Instrument Calibration
Cesium-137	Microcuries	UCLA	3 years	Spectrometry

Mr. Kerris was employed by UCLA as a Research Assistant for 3 years. During that time, he assisted in the development and construction of a 50 MeV proton cyclotron. He was also involved in the operation of the 18 MeV proton cyclotron and used various small sources for beta and gamma spectrometry and instrument calibration.

At Hughes Aircraft Company, he participated in the design of several linear electron accelerators. He was extensively involved in experiments using a 10 MeV linear electron accelerator, a 1 MeV Electron Beam Generator, and a 7 kCi Cobalt-60 source.

At Harry Diamond Laboratories, he has been in charge of dosimetry measurements at Aurora, a 10 MeV pulsed bremsstrahlung generator. In addition, he has functioned as Facility Supervisor of the HDL Cobalt-60 water-well irradiator since 1975.

Supplement #2 continued

Charles C. Casaer (Chief Operator, Cobalt-60 Irradiator)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Cobalt-60	1 Ci	Harry Diamond Labs	10 years	In-Air Instrument Calibration
Cobalt-60	25,000 Ci	Harry Diamond Labs	1 1/2 yrs	In-Air Radiation Effects Testing

In addition, Mr. Casaer has been Chief Operator of the Pulsed X-ray Generator (HIFX) at HDL for the past 13 years. His duties in this position involved the use of GM, Scintillation, and T.L.D. instrumentation for general radiation surveys, remove area monitors, and radiation effects dosimetry. He has recently completed a 48-hour course of instruction and training in operation of the HDL Cobalt-60 Facility for in-air irradiations. Instruction and supervision was provided by Mr. Klaus Kerris, Supervisor of the Cobalt-60 Facility.

Perry Sarigianis (Alternate Operator, Cobalt-60 Irradiator)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Cobalt-60	20,000 Ci	Harry Diamond Labs	Since Oct 80	Irradiator
Cf 252	90 ug	USGS	10 mo	Activation Analysis
PuBe		Allis Chalmers Co	3 years	Detector Calibration
Cs137		Allis Chalmers Co	3 years	" "
Cs137		USGA	1 year	" "
Cobalt-60	10 Ci	Allis Chalmers	4 years	" "

Furthermore, Mr. Sarigianis has been Senior Technician at the 10 MeV, pulsed bremsstrahlung generator (Aurora) at Harry Diamond Labs for 10 years. His duties included instrumentation control and electromechanics. He has recently completed a two day course of instruction and training at the HDL Cobalt-60 Facility for in-air irradiation. Instruction and supervision was provided by Mr. Klaus Kerris, Supervisor of the Cobalt-60 Facility and approved by the Ionizing Radiation Committee at Harry Diamond Laboratories.

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SUPPLEMENT #3

Item 10. Form AEC-313, Radiation Detection Instruments

TYPE OF INSTRUMENTS	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mR/hr)	WINDOW THICKNESS (mg/cm^2)	USE
Gamma Dose Rate Meter Model Gadora-1B, Ser #237	1	Gamma	$1x10^3$ - $3x10^6$	------	Emergency Monitor
Ludlum Model 2, Ser #11519 Ser #9607	2	Beta, Gamma	0.1-50	30 & 1000	Survey and Monitor
Victoreen Survey Meter Model 440-RF, Ser #1370	1	Gamma	1.-300	1.0	Survey and Monitor
Victoreen Thyac II Model 489, Ser #904	1	Alpha, Beta, Gamma	0.05-20.	1.4	Survey and Monitor
Victoreen Thyac III Model 489, Ser #2307	1	Beta, Gamma	0.05-200	30	Survey and Monitor

05602

DELHD-SA

SUBJECT: Request For Renewal of NRC License 19-17250-01

THRU: Commander
U. S. Army Electronics Research and
Development Command
ATTN: DRDEL-SS
2800 Powder Mill Road
Adelphi, MD 20783

TO: Commander
U. S. Army Materiel Development and
Readiness Command
ATTN: DRCSF-P
5001 Eisenhower Avenue
Alexandria, Virginia 22333

Forwarded is Form NRC 313i, Application For Byproduct Material License, requesting the renewal of NRC License 19-17250-01. This request includes the following changes to the current license:

a. Use of Form NRC 313i instead of Form AEC 313.

b. Deletion of Michael Funkhouser and addition of Michael J. Borisky as Radiation Protection Officer.

c. Update of radiation detection instruments.

d. Calibration procedures for radiation detection instruments.

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as

ALLAN R. BURKE
COL, OrdC
Commanding

12287

T. Grucci/seb/49340

DRCSF-P/80-0055

22 May 1980

Director
Nuclear Material Safety and Safeguards
ATTN: Radioisotopes Licensing Branch
US Nuclear Regulatory Commission
Washington, DC 20555

Gentlemen:

Forwarded is resume of Mr. Michael D. Funkhouser who is designated new radiation protection officer at Harry Diamond Laboratories replacing Claude Rowe. Request following licenses be amended to reflect change in radiation protection officer:

EML 19-17250-01
19-17250-04
19-17250-05
SNM-348

Please acknowledge receipt of correspondence on inclosed DA form 209 Reply Card.

Sincerely,

2 Incl
as stated

DARWIN N. TARAS
Chief, Health Physics
Safety Office

CF:

HQDA (DASG-PSP-E) Washington, DC 20310
DIR, DARCOM FSA, Charlestown, IN 47111

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2 DEC 1979

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MICHAEL D. FUNKHOUSER, Health Physicist, Harry Diamond Laboratories (HDL), Adelphi, Maryland.

a. Education:

(1) B.S. - University of Florida, Gainesville, Florida - 1969. Major: Physics

(2) M.S.A.N.S. - Georgia Institute of Technology, Atlanta, Georgia - 1978. Major: Health Physics

b. Professional Experience:

(1) January 1970 - April 1970
State of Georgia Department of Public Health, 47 Trinity Place, S.W., Atlanta, Georgia.
Sanitarian Trainee - Introduction and Orientation in the Georgia State Public Health Services - Participated in daily classes in preparation of state wide assignment as Sanitarian. Awarded Certification of Achievement, Georgia Department of Public Health Enviromental Health Training.

(2) April 1970 - September 1977
State of Georgia, East Atlanta Regional, County of DeKalb Department of Public Health, 440 Winn Way, Decatur, Georgia.
Senior Sanitarian - Responsible for the application and enforcement of state and county health codes. Conduct routine inspection of food service facilities, school cafeterias, swimming pools, state institutions, and investigate a wide variety of environmental complaints for compliance with state and county rules and regulations. Conduct epidemiological tests, microwave oven examinations, chemical analyses, submit construction and building authorizations, evaluate reports and studies. Consult with food service management on planning and construction; instruct food service personnel on good health practices in food service preparation. Consult with landlords on county housing codes; instruct tenants on housing hygiene and vermin control. Participate in state and county housing, institutional, and community surveys. Prepare and submit reports to state and county commissions. Testify in legal hearings. Present litigation in county courts. Certified Registered Professional Sanitarian 1972.

(3) September 1977 - September 1978
Georgia Institute of Technology, School of Nuclear Engineering, Atlanta, Georgia.
Student - Master of Science in Applied Nuclear Science

(4) October 1978 - October 1979
US Army Communications and Electronics Materiel Readiness Command (CERCOM), Fort Monmouth, New Jersey.
Health Physicist - Responsible for the implementation and participation in health physics srevices for the CERCOM Safety Program. Perform studies of potentally hazardous radiological conditions; submit evaluations and recommendations that minimize health risks to personnel. Identify CERCOM commodities containing radioactive sources; maintain procurement and logistic control measures over ionizing sources. Communicate daily with US Army Depot Radiation Protection Officers on commodity identification, US Nuclear Regulatory Commission Rules and Regulations, and Department of Army Authorizations. Conduct comprehensive radiological surveys of US Army Depots. Prepare and evaluate reports and make recommendations.

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MICHAEL D. FUNKHOUSER, Health Physicist

(5) October 1979 - Present

Harry Diamond Laboratories (HDL), 2800 Powder Mill Rd, Adelphi, Maryland, 20783.

Health Physicist - Responsible for radiation and laser protection program at HDL. Enforce Federal and State radiation protection standards. Perform studies and evaluations of potentially hazardous radiological conditions associated with accelerators, flash X-ray, laser, irradiated electronics, kilocurie Cobalt-60, and microcurie/millicurie Atomic Numbers 3-94.

MICHAEL D. FUNKHOUSER, Health Physicist

c. Formal Training:

Type of Training	Where Trained	Duration of Training	On the Job	Formal Courses
(1) Principles	Georgia Tech	1 year	No	Yes
	University of Florida	2 years	No	Yes
	HDL*	5 months	Yes	No
(2) Measurements	Georgia Tech	1 year	No	Yes
	Neely Research Reactor	3 months	Yes	No
	Tobyhanna Army Depot	2 weeks	Yes	No
	HDL*	5 months	Yes	No
(3) Mathematics	Georgia Tech	1 year	No	Yes
	U of Florida	2 years	No	Yes
	HDL*	5 months	Yes	No
(4) Biology	Georgia Tech	1 year	No	Yes
	U of Florida	2 years	No	Yes
	HDL*	5 months	Yes	No

d. Experience with Radiation:

Isotope	Maximum Amount	Duration of Experience (years)	Type of Use
Atomic Nos 1-82	uCi-mCi	0.3	Leak Tests/Surveys/ Calibration Studies
Hydrogen-3	100 uCi	1	Wipe tests
Carbon-14	10 uCi	2	Spectroscopy
Cobalt-60	1 uCi	1	Spectoscopy
Cobalt-60	500 Ci	1	Calibration studies
Cobalt-60	12,000 Ci	1	Chemical dosimetry
Cobalt-60	20,000 Ci	0.3	Leak tests/surveys
Strontium-90	50 uCi	1	Spectroscopy
Yttrium-90	50 uCi	1	Spectroscopy
Indium-116	10 uCi	1	Activation studies
Gold-198	5 uCi	1	Spectroscopy
Bismuth-212	20 uCi	1	Spectroscopy
Lead-212	20 uCi	1	Spectroscopy
Radium-226	50 uCi	1	Calibration studies
Antinides	1 uCi	1	Chemical separation studies
Lanthanides	1 uCi	1	Chemical separation studies
Thorium Series	1 uCi	1	Radionuclide identification studies
Transuranics	4 Ci	0.3	Leak tests/surveys
Uranium Series	1 uCi	1	Radionuclide ident studies

*Harry Diamond Laboratories

d. Experience with Radiation Producing Machines

Radiation Machine	Duration of Experience (yrs)	Type of Use
Aurora (Harry Diamond Labs)	0.3	Surveys/dosimetry
Betatron (Emory U, Atlanta,GA)	1	Dosimetry and phantom studies
Febetron (Harry Diamond Labs)	0.3	Surveys/dosimetry
Medical Linear Accelerator (Emory U)	1	Dosimetry and phantom studies
Microwave ovens	7	Surveys
X-ray radiography (Harry Diamond Labs)	0.3	Surveys/dosimetry

HARRY DIAMOND LABORATORIES
OFFICE OF THE DIRECTOR
2800 POWDER MILL ROAD, ADELPHI, MD. 20783

DRDHF-P/77-0048 30 June 1977

Director
Nuclear Material Safety and Safeguards
US Nuclear Regulatory Commission
ATTN: Radioisotopes Licensing Branch
Washington, DC 20555

Gentlemen:

Forwarded is Harry Diamond Laboratories, Adelphi, Maryland application for renewal of Byproduct Material License Number 19-17250-01.

Please acknowledge receipt of correspondence on enclosed NRC-46 Reply Card.

Sincerely,

DARWIN N. TARAS
Chief, Health Physics
Safety Office

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as

Cy Furn:
HQDA (DASG-HCH-E) WASH DC 20310
Dir, DARCOMFSA, Charlestown, IN 47111

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Form AEC-313 (2-73) 10 CFR 30	UNITED STATES ATOMIC ENERGY COMMISSION **APPLICATION FOR BYPRODUCT MATERIAL LICENSE**	Form approved Budget Bureau No. 38-R0027

INSTRUCTIONS.—Complete items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to items 8 through 15 may be incorporated by reference provided *references are clear and specific.* Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Materials Branch, Directorate of Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).

1. (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital person, etc. Include ZIP Code and telephone number.)*

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. *(If different from 1(a). Include ZIP Code.)*

Diamond Ordnance Radiation Facility (DORF)
Forest Glen, Maryland 20901

Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Laboratory 200

3. PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

Renew and
Amend NRC License No. 19-17250-01

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

Paul A. Caldwell, Chief, Branch 290
Walter E. Gieseler, Physicist-in-Charge, DORF
Joseph D. Silverstein, Supervisory Physicist
James E. Stafford, RPO

5. RADIATION PROTECTION OFFICER. *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

James E. Stafford (RPO)
James M. McGarrity - Alternate RPO
Claude A. Rowe - Alternate RPO
(SEE SUPPLEMENTS NO. 1 and 2)

6. (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*	(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*
Cobalt-60	245 mC of Cobalt-60: Three (3) each 12 mC; one (1) 15 mC; and one (1) 1.0 mC.
Cobalt-60	One (1) sealed source 2.0 curies - Style 850213 Nuclear Chicago.
Cesium-137	One (1) 15 mC sealed source.
Cesium-137	One (1) sealed source 1.0 curie - Style 850233 Nuclear Chicago.

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

The sources will be used for calibration of radiation detection instruments.

The sources of millicurie activity will be stored in lead pigs in the radioactive materials storage building. The 2.0 curie Co-60 and the 1.0 curie Cs-137 sources will be stored in the radioactive materials storage building in the device shown.

See Figures 1 and 2.

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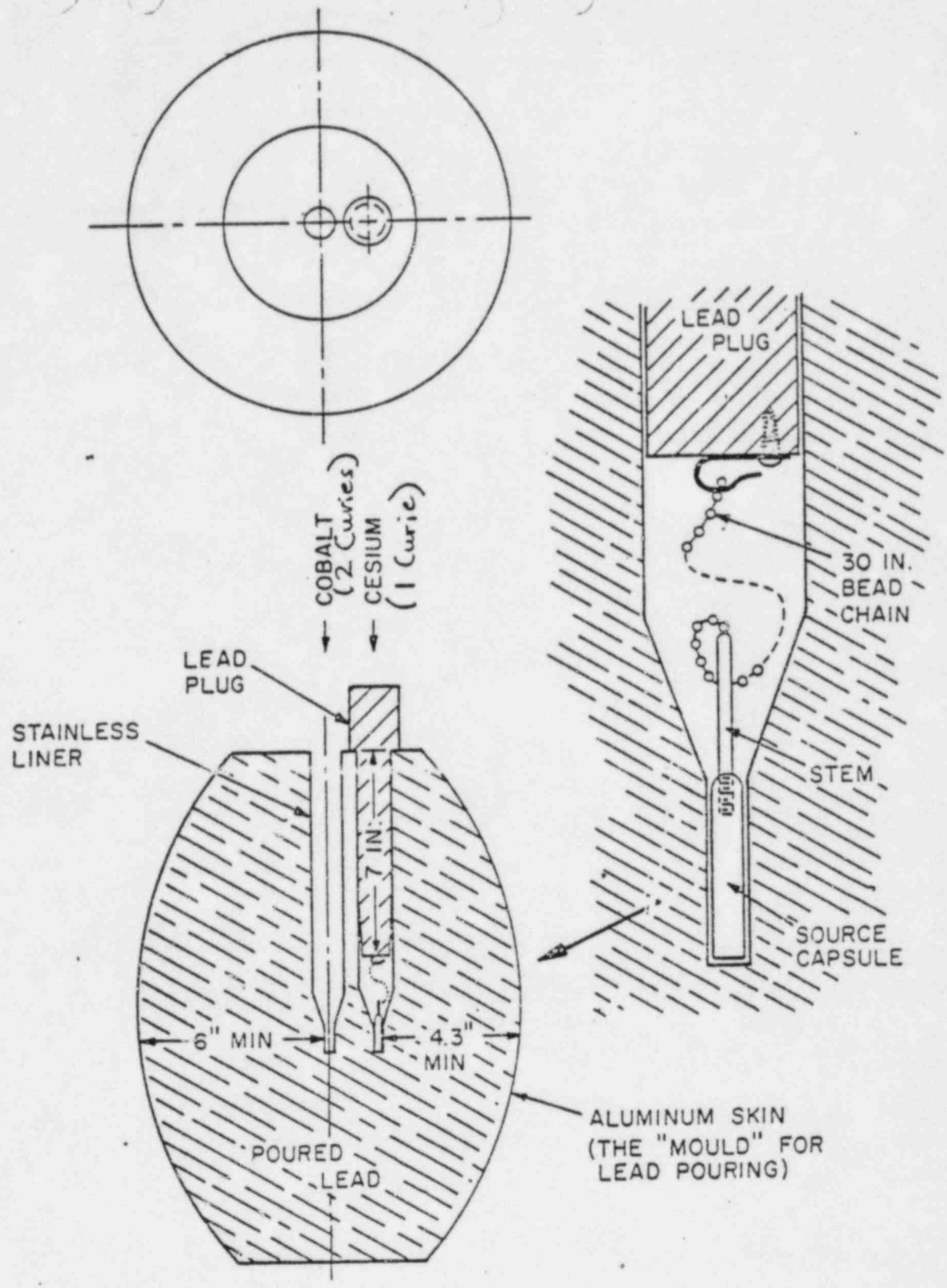

Figure 1. Storage container.

SUPPLEMENT #1

Item 5, Form AEC-313 (See Item 8 and Item 9)

Item 8, Form AEC-313, Training of Radiation Protection Officer and Users.

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FORMAL COURSE
James E. Stafford (Radiation Protection Officer)				
a. Principles	Montgomery College	2 years	Yes	Yes
	DHEW-PHS Training Inst.	1 month	No	Yes
	Nat'l Bur. of Standards	1 year	Yes	No
	AFRRI*	2 years	Yes	No
	HDL**	3 years	Yes	No
b. Measurement	Montgomery College	2 years	Yes	Yes
	DHEW-PHS Training Inst.	1 month	No	Yes
	Nat'l Bur. of Standards	1 year	Yes	No
	AFRRI*	1 year	Yes	No
	HDL**	3 years	Yes	No
c. Mathematics	Montgomery College	2 years	No	Yes
	DHEW-PHS Training Inst.	1 month	Yes	Yes
	NIH Graduate School	1 year	No	Yes
	Nat'l Bur. of Standards	1 year	Yes	No
	AFRRI*	2 years	Yes	No
	HDL**	3 years	Yes	No
d. Biological	Montgomery College	2 years	No	Yes
	Univ. of Maryland	1 year	No	Yes
	Univ. of Iowa	1 year	No	Yes
	AFRRI*	2 years	Yes	No
	HDL**	3 years	Yes	No
James M. McGarrity (Alternate RPO)				
a. Principles	Univ. of Maryland	4 years	No	Yes
	Univ. of Maryland	1 year	Yes	No
b. Measurement	Univ. of Maryland	3 years	No	Yes
	Univ. of Maryland	1 year	Yes	No
c. Mathematics	HDL**	4 years	Yes	No
	Univ. of Maryland	4 years	No	Yes
d. Biological	Univ. of Maryland	1 year	Yes	No
	HDL**	3 years	Yes	No

Supplement No. 1 continued.

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB	FORMAL COURSE
Joseph D. Silverstein				
a. Principles	Naval Research Labs	2 years	Yes	No
	HDL**	5 years	Yes	No
	Columbia University	5 years	Yes	Yes
b. Measurement	Naval Research Labs.	2 years	Yes	No
	HDL**	5 years	Yes	No
	Columbia University	5 years	Yes	Yes
c. Mathematics	Naval Research Labs.	2 years	Yes	No
	HDL**	5 years	Yes	No
	Columbia University	5 years	Yes	Yes
d. Biological	Naval Research Labs.	2 years	Yes	No
	HDL**	2 years	Yes	No

*Armed Forces Radiobiology Research Institute
**Harry Diamond Laboratories
***National Bureau of Standards

Supplement No. 2 continued.

survey procedures for the 4.5 MeV LINAC and a 30,000 Ci Cobalt facility, and performed the tasks necessary to operate, maintain, and calibrate the stack gas monitoring system used to analyze LINAC and Reactor effluents.

Prior to employment as a Health Physicist by the AFRRI, Mr. Stafford was employed as a Health Physics Technician by the AFRRI for a period of 6 months, by the National Bureau of Standards (NBS) for a period of 1 year, and by Montgomery College for 6 months. While employed as a Health Physics Technician, Mr. Stafford conducted inplant radiological surveys, performed radiological monitoring of exposure facilities and areas associated with a pulsing-steady state reactor, X-ray machines and radioisotope laboratories in order to determine radiological safety procedures for personnel in the area of interest, performed weekly radiation monitoring and contamination surveys of in-plant air, water, and surfaces and recommended decontamination, waste disposal and exposure reduction techniques to investigators when necessary. He was responsible for performing calibration of radiation survey instruments as well as for performing other duties necessary for the implementation of the health physics program at the various places of employment.

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
James M. McGarrity (Alternate RPO)				
Cobalt-60	5000 Ci	Univ. of Maryland	2 years	Calibration & Research
Strontium-90	Several mCi	HDL**	3 years	Instrument Calibration
Cesium-137	Several mCi	HDL**	3 years	Instrument Calibration
Pu-Be Neutron Source	1 Ci	Univ. of Maryland	4 years	Instrument Calibration & Sub-Critical Assembly

In addition, as a graduate assistant and reactor staff member for 2 years at the University of Maryland Reactor, Dr. McGarrity assisted as an instructor in courses on Reactor Technology which included Health Physics as well as reactor operations. Also, he has 10 years experience at the HDL Triga Reactor Facility (DORF) as Reactor Staff Physicist, advising the Physicist-in-Charge on matters of operation and safety. His work at the University of Maryland included 5 years experience with a PS-100 500 KeV Van de Graaf accelerator.

Claude A. Rowe (Alternate RPO)				
Co-60	39,448 Ci	HDL**	1 year	Chief Operator of Co-60 Water-Well Irradiator
Cs-137	100 mCi	NBS***	3 years	Instrument Calibration
Co-60	10 Ci	NBS***	3 years	Instrument Calibration

Supplement No. 2 continued.

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Joseph D. Silverstein				
Misc. Isotopes	1-100 mCi	Columbia Univ.	5 years	Detector Calibration
		Naval Research Lab	2 years	" "
Co-60	2 Ci	HDL**	5 years	Calibration & Measurement Studies
Cs-137	1 Ci	HDL**	5 years	" "

Between October 1964 and January 1967, Dr. Silverstein performed nuclear physics research at the NRL 2 MeV Triton Van de Graaf. This work involved safe handling of tritium gas bottles (about 100 millicuries at full pressure) during its installation in and removal from the Van de Graaf ion source. It also required familiarity with neutron air monitors. From September 1970 to the present, Dr. Silverstein has been the Supervisory Physicist at the Harry Diamond Laboratories Flash X-Ray Facility. This machine is capable of producing short bursts of gamma rays with a dose of up to 5,000 roentgens at its target plate. It has a regular staff of three, and one to three additional persons are normally present during a radiation test. As supervisor, he was responsible for implementing an SOP which satisfies all appropriate radiation safety standards for such a facility. In addition, his work at this facility involves the calibration of thermoluminescent dosimeters with 1 curie Co-60 and Cs-137 sources. This involved full cognizance of the radiation hazards involved in the handling of these sources and in the formulation of an SOP to safeguard against these hazards.

*Armed Forces Radiobiology Research Institute
**Harry Diamond Laboratories
***National Bureau of Standards

Supplement No. 3 continued.

Item 11, Form AEC-313, Method, Frequency, and Standards Used in Calibrating Instruments Listed Above.

The instruments to be calibrated will be placed at a known distance from a known source. The reading on the meter will be observed in the case of a count rate meter. The calculated values at various distances from the known source will be compared with the observed meter response.

On occasion, at the discretion of the HDL Radiation Protection Officer, certain instruments may be calibrated by others such as the Instrument Manufacturer, the National Bureau of Standards, or a qualified contractor.

The surveying and monitoring instruments that are in use at HDL will be calibrated at intervals of no longer than three months, however, constancy checks will be made frequently.

The surveying and monitoring instruments that are in use at DORF will be calibrated at intervals of no longer than three months and will probably be calibrated monthly which is the schedule followed by Walter Reed Army Medical Center.

The following sources are available for calibration and constancy checks.

a. 1 Co-60 source, 12.3 mR/h at one meter, 26 Jan 1961 (NBS calibrated)
b. 1 Co-60 source, 1.07 mR/h at one meter, 26 Jan 1961 (NBS calibrated)
c. 1 Co-60 source, 2.58 mR/h at one meter, 30 Nov 1972 (US Army calibrated)
d. 1 Cs-137 source, 32.6 R/h at one meter, 2 Mar 1970 (AFRRI calibrated, traceable to NBS)
e. Radium (D+E) check source obtained from the National Bureau of Standards, approximately 28,000 counts/min alpha plus beta, 23 March 1962.

SUPPLEMENT #5

Item 14. Radiation Protection Program.

There is in HDL a Radiation Control Committee composed of the Radiation Protection Officer, the Safety Officer, a representative of the administrative office, and several technical members trained or experienced in the use of radioactive materials. The Committee is responsible for the formulation of rules and procedures necessary to (1) minimize hazards due to ionizing radiation, and (2) insure compliance with all applicable regulations. The use of the requested material will be under the cognizance of this Committee.

Per agreement between the Commander, Walter Reed Army Medical Center, and the Commander, Harry Diamond Laboratories, on site Health Physics service at DORF is provided by personnel from the Walter Reed Army Medical Center under direction of the WRAMC Health Physics Officer. The WRAMC Health Physicist on duty at DORF is known as the DORF Health Physicist. At least one Health Physicist will be on duty at DORF during all operating hours. A complete Health Physics Office is maintained at DORF. Various Beta-Gamma, Neutron, and Alpha radiation detection instruments are available.

The sources will be leak tested at intervals not to exceed 6 months under the direction of the HDL Radiation Protection Officer. The leak tests will be made in one of the following ways:

a. The source will be wiped with a filter paper (or the filter paper will be wiped with the source) and the filter paper will be counted in an internal gas-flow proportional counter.

b. The source will be swabbed with a piece of cotton, perhaps with a suitable solvent, and the cotton swab will be counted in an internal gas-flow proportional counter.

c. A piece of masking tape may be folded, sticky surface out, around a dowel or paddle. The surface will be swabbed, the tape cut away from the dowel and attached to the inside bottom of a planchet for counting in an internal gas-flow proportional counter.

If a source needs service, maintenance or repair, it will be returned to the manufacturer or transferred to a vendor authorized to repair these sources, or it will be disposed of as radioactive waste material by transferring it to a properly licensed agency or firm. No repairs of leaking sources will be made by HDL.

Item 15. Waste Disposal.

Waste disposal will be handled by the US Army Armament Materiel Readiness Command, Rock Island, IL, in accordance with the procedures delineated in Army Regulation 755-15, "Disposal of Unwanted Radioactive Material."

DRCSF-P/78-0002 16 January 1978

Director
Nuclear Material Safety and Safeguards
ATTN: Radioisotopes Licensing Branch
US Nuclear Regulatory Commission
Washington DC 20555

Gentlemen:

Forwarded is Harry Diamond Laboratories' application for renewal and amendment of Byproduct Material License Number 19-17250-04,

The following changes are requested in the renewal application:

a. Remove the Diamond Ordnance Radiation Facility, Forest Glen, MD and the Harry Diamond Laboratories, Washington DC site from list of street addresses at which byproduct materials may be used.

b. Add US Army Test and Evaluation Command, Aberdeen Proving Ground MD and the Armed Forces Radiobiology Research Institute, Bethesda MD to the list of street addresses at which byproduct material may be used.

c. Remove Emmert D. McGarry, Frederick W. Balicki, and Mark S. Rothstein from list of users.

d. Add Craig R. Heimbach, Terry L. Pruitt, and Stewart Share to list of users.

e. Revise list of radiation detection instruments to coincide with Supplement 5 of application.

f. Delete Radioactive Materials Storage Building at Harry Diamond Laboratories, Washington DC site from approved byproduct material storage areas.

g. List Army radioactive waste disposal function at US Army Armament Material Readiness Command, Rock Island IL rather than Aberdeen Proving Ground MD.

Dupe of ~~8307210075~~

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DRCSF-P/78-0002 16 January 1978

Please acknowledge receipt of correspondence on inclosed NRC-46 Reply Card (Incl 2).

Sincerely,

2 Incl
as

DARWIN N. TARAS
Chief, Health Physics
Safety Office

CF:
HQDA (DASG-HCH-E) WASH DC 20310 w/incl 1 (dupe)
Dir, DARCOM FSA, Charlestown IN 47111 w/incl

Mr. Grucci
49340/kr

Form AEC-313 (2-73) 10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved Budget Bureau No. 38-20027

INSTRUCTIONS.—Complete items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to items 3 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Materials Branch, Directorate of Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital person, etc. Include ZIP Code and telephone number.)

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1(a). Include ZIP Code.)

Harry Diamond Laboratories, Adelphi, MD
National Bureau of Standards,
Gaithersburg, MD 20760
US Army Test & Evaluation Command,
Aberdeen Proving Ground, MD 21005
Armed Forces Radiobiology Research
Institute, Bethesda, MD 20014

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Nuclear Radiation Effects Laboratory, 200
Applied Physics Branch, 320

3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)

Renew and amend NRC License No. 19-17250-04

4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in items 8 and 9.)

Craig R. Heimbach (Physicist)
Harvey A. Eisen (Physicist)
Paul A. Trimmer (Physicist)
Terry L. Pruitt (Electronic Engineer)
Stewart Share (Physicist)
Donald E. Wortman (Physicist)

5. RADIATION PROTECTION OFFICER. (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in items 8 and 9.)

James E. Stafford (RPO)
James M. McCarrity (Alternate RPO)
Claude A. Rowe (Alternate RPO)
Norman J. Berg (Electrical Engineer)
Clyde A. Morrison (Physicist)

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)

Any byproduct material with Atomic Nos. 3-83 inclusive.

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)

1. Activated electronic equipment resulting from radiation effects tests.

2. Isotopes resulting from the activation of threshold detectors.

3. Isotopes resulting from the activation of crystals (laser materials).

Maximum No. of Millicuries

Items 1 & 2 -- 250
Item 3 ------- 100,000

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

Activated electronic equipment will be subject to post irradiation examination. Threshold detectors will be used in dosimetry and/or neutron spectrum measurements.

Activated crystals (laser materials) will be used in the experimental development of laser devices.

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TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	See Supplement #1 for resume of individuals named in Item 4.		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments	See Supplement #1 for resume of individuals named in Item 5.		Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		See Supplement #2 for resume of individuals named in Item 4. See Supplement #2 for resume of individuals named in Item 5.		

10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm²)	USE (Monitoring, surveying, measuring)
		See Supplement #3			

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

See Supplement #3

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

Film badge service is provided by Lexington-Blue Grass Army Depot, Lexington, Kentucky 40507. Film badges are replaced monthly.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No

See Supplement #4

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

See Supplement #5

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

See Supplement #5

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

License Fee Category $ _____

Fee Enclosed $ _____

HARRY DIAMOND LABORATORIES
Applicant named in Item 1

By: [signature]
JOHN J. RAMSDEN
COL, OD, Commanding
Title of certifying official

Date 16 Jan 1978

APPROVED: JAMES E. STAFFORD (RPO)

WARNING.—18 U. S. C., Section 1001, Act of June 25, 1948; 62 Stat. 749, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

* U.S. GPO: 1973—543-125.5

Supplement No. 1 continued.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
Claude A. Rowe (Alternate RPO)				
a. Principles	Navy Nuclear Power School (Health Physics)	1 year	No	Yes
	US Navy	6 months	Yes	No
	Argonne Nat'l Labs.	1 year	No	Yes
	HDL**	1 year	Yes	No
b. Measurement	Navy Nuclear Power School (Health Physics)	1 year	No	Yes
	US Navy	6 months	Yes	No
	Argonne Nat'l Labs.	1 year	No	Yes
	HDL**	3 years	Yes	No
c. Mathematics	Navy Nuclear Power School (Health Physics)	1 year	No	Yes
	US Navy	6 months	Yes	No
	Argonne Nat'l Labs.	1 year	No	Yes
	Lewis College	2 years	No	Yes
	HDL**	3 years	Yes	No
d. Biological	Navy Nuclear Power School (Health Physics)	1 year	No	Yes
	US Navy	6 months	Yes	No
	Argonne Nat'l Labs.	1 year	No	Yes
Craig R. Heimbach				
a. Principles	HDL**	5 years	Yes	Yes
b. Measurement	HDL**	5 years	Yes	No
	NBS***	3 years	Yes	No
c. Mathematics	HDL**	5 years	Yes	No
	NBS***	3 years	Yes	No
d. Biological	HDL**	1 year	Yes	Yes
Harvey A. Eisen				
a. Principles	HDL**	2 years	Yes	No
	NBS***	5 months	No	Yes
	Univ. of Maryland	1 year	No	Yes
b. Measurement	Univ. of Maryland	2 years	No	Yes
	HDL**	10 years	Yes	No

Supplement No. 1 continued.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
Harvey A. Eisen, continued				
c. Mathematics	Univ. of Maryland	2 years	No	Yes
	HDL**	10 years	Yes	No
d. Biological	HDL**	1 week	Yes	No
	NBS***	5 months	No	Yes
Paul A. Trimmer				
a. Principles	Penn. State Univ.	4 years	No	Yes
	American Univ.	3 years	No	Yes
	HDL**	14 years	Yes	No
b. Measurement	Defense Atomic Support Agency	2 weeks	No	Yes
	NBS Graduate School***	3 months	No	Yes
	HDL**	14 years	Yes	No
c. Mathematics	Penn. State Univ.	4 years	No	Yes
	American Univ.	3 years	No	Yes
	HDL**	14 years	Yes	No
d. Biological	NBS Graduate School***	3 months	No	Yes
Terry L. Pruitt				
a. Principles	HDL**	5 months	Yes	Yes
b. Measurement	HDL**	5 months	Yes	Yes
c. Mathematics	HDL**	5 months	Yes	Yes
d. Biological	HDL**	5 months	Yes	Yes
Stewart Share				
a. Principles	HDL**	5 years	Yes	Yes
b. Measurement	HDL**	5 years	Yes	Yes
c. Mathematics	HDL**	5 years	Yes	Yes
d. Biological	HDL**	1 year	Yes	Yes

Supplement No. 1 continued.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
D. E. Wortman				
a. Principles	Indiana Univ.	4 years	Yes	Yes
	HDL**	2 years	Yes	No
b. Measurement	Indiana Univ.	4 years	Yes	Yes
	HDL**	2 years	Yes	No
c. Mathematics	Indiana Univ.	4 years	Yes	Yes
	HDL**	2 years	Yes	No
d. Biological	Indiana Univ.	1 year	Yes	No
	HDL**	2 years	Yes	No
Norman J. Berg				
a. Principles	HDL**	7 years	Yes	No
b. Measurement	Univ. of Maryland	4 years	No	Yes
	Illinois Inst. of Technology	5 years	No	Yes
	HDL**	7 years	Yes	No
c. Mathematics	Univ. of Maryland	4 years	No	Yes
	Illinois Inst. of Technology	5 years	No	Yes
	HDL**	7 years	Yes	No
d. Biological	HDL**	6 months	Yes	No
C. A. Morrison				
a. Principles	Univ. of Michigan	2 years	No	Yes
	HDL**	1 year	Yes	No
b. Measurement	HDL**	1 year	Yes	No
c. Mathematics	Univ. of Michigan	2 years	No	Yes
	HDL**	1 year	Yes	No
d. Biological	HDL**	1 year	Yes	No

*Armed Forces Radiobiology Research Institute
**Harry Diamond Laboratories
***National Bureau of Standards

SUPPLEMENT #2

Item 9, Form AEC-313, Experience with Radiation for RPO and Users.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
James E. Stafford (Radiation Protection Officer)				
Cobalt-60	39,448 Ci	HDL**	1 year	Routine Health Physics
Cobalt-60	15 Ci	AFRRI*	2 years	Calibration & Dosimetry Studies
Cesium-137	10 Ci	AFRRI*	2 years	Calibration & Dosimetry Studies
Plutonium-239	3 Ci	Montgomery College	2 years	Calibration &
	5 Ci	NBS***	1 year	Dosimetry Studies
Misc. Fission Products	1 uCi to 1 Ci	AFRRI*	2 years	Routine Health
	250 mCi	HDL**	3 years	Physics
Misc. Isotopes	1 uCi to 100 mCi	Montgomery College	2 years	Calibration & Dosimetry Studies
		DHEW-PHS Training Institute	1 month	Calibration & Dosimetry Studies
		NBS***	1 year	Routine Health Physics
		AFRRI*	2 years	Routine Health Physics
		HDL**	3 years	Routine Health Physics

Experience with Radiation for RPO

Mr. Stafford has been employed as a Health Physicist by the Department of the Army, Harry Diamond Laboratories (HDL) for 5 years. During that time, he has been responsible for planning and implementing the HDL radiation safety program. His duties have included the safety analysis of radiation facility design and associated construction techniques in order to ensure the inclusion of adequate shielding and safety support systems for a 50,000 curie Cobalt-60 water-well/in-air irradiator, a 5 MeV Flash X-ray Facility and various industrial X-ray units. In addition, he has been responsible for reviewing, recommending, and monitoring the operating procedures associated with the safe use of ionizing radiation sources at HDL to ensure compliance with applicable regulations and recognized safe practices.

Before transferring to HDL, Mr. Stafford was employed as a Health Physicist by the Armed Forces Radiobiology Research Institute (AFRRI) for a period of 1½ years. In that capacity, he participated in the development and improvement of various radiation protection systems, assisted in development of operational survey procedures for the 4.5 MeV LINAC and a 30,000 Ci Cobalt facility, and performed the tasks necessary to operate, maintain, and calibrate the stack gas monitoring system used to analyze LINAC and Reactor effluents.

Supplement No. 2 continued.

Prior to employment as a Health Physicist by the AFRRI, Mr. Stafford was employed as a Health Physics Technician by the AFRRI for a period of 6 months, by the National Bureau of Standards (NBS) for a period of 1 year, and by Montgomery College for 6 months. While employed as a Health Physics Technician, Mr. Stafford conducted inplant radiological surveys, performed radiological monitoring of exposure facilities and areas associated with a pulsing-steady state reactor, X-ray machines and radioisotope laboratories in order to determine radiological safety procedures for personnel in the area of interest, performed weekly radiation monitoring and contamination surveys of in-plant air, water, and surfaces and recommended decontamination, waste disposal and exposure reduction techniques to investigators when necessary. He was responsible for performing calibration of radiation survey instruments as well as for performing other duties necessary for the implementation of the health physics program at the various places of employment.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
James M. McGarrity (Alternate RPO)				
Cobalt-60	5000 Ci	Univ. of Maryland	2 years	Calibration & Research
Strontium-90	Several mCi	HDL**	3 years	Instrument Calibration
Cesium-137	Several mCi	HDL**	3 years	Instrument Calibration
Pu-Be Neutron Source	1 Ci	Univ. of Maryland	4 years	Instrument Calibration & Sub-Critical Assembly

In addition, as a graduate assistant and reactor staff member for 2 years at the University of Maryland reactor, Dr. McGarrity assisted as an instructor in courses on Reactor Technology which included Health Physics as well as reactor operations. Also, he has 10 years experience at the HDL Triga Reactor Facility (DORF) as Reactor Staff Physicist, advising the Physicist-in-Charge on matters of operation and safety. His work at the University of Maryland included 5 years experience with a PS-100 500 KeV Van de Graaf accelerator.

Claude A. Rowe (Alternate RPO)				
Co-60	39,448 Ci	HDL**	1 year	Chief Operator of Co-60 Water-Well Irradiator
Cs-137	100 mCi	NBS***	3 years	Instrument Calibration
Co-60	10 Ci	NBS***	3 years	Instrument Calibration
Pu-Be	10 Ci	NBS***	3 years	Instrument Calibration
I-131	100 mCi	Univ. of Kentucky Medical Center	5 months	Radiation Therapy

Supplement No. 2 continued.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
Claude A. Rowe, continued.				
Au-198	100 mCi	Univ. of Kentucky Medical Center	5 months	Radiation Therapy
Misc. (3-83)	Various Amounts (few uCi to several hundred mCi)	" "	10 years	Routine Health Physics

Mr. Rowe has acted as the Chief Operator of the HDL Cobalt-60 water-well irradiator for one year. In addition, he was employed as a Health Physicist at the Argonne National Labs for approximately 4 years, the National Bureau of Standards for 3 years, the University of Kentucky Medical Center for 5 months, and the Charleston Navy Shipyard for 2 years.

Craig R. Heimbach				
Californium	2 mCi	NBS***	3 years	Research
Misc. Sealed Byproduct Material Sources	10 mCi	HDL**	5 years	Calibration Studies
Plutonium-239	1 gm Fission Foils	HDL**	5 years	Calibration Studies
Neptunium-237	1 gm Fission Foils	HDL**	5 years	Calibration Studies
Uranium-235 and -238	1 gm Fission Foils	HDL**	5 years	Calibration Studies
Harvey A. Eisen				
Cobalt-60	20,000 Ci	HDL**	10 years	Electronic Component Testing
Misc. (3-83)	1 mCi	HDL**	14 years	Electronic Component Testing
Paul A. Trimmer				
Cobalt-60	20,000 Ci	HDL**	13 years	Electronic Component Testing
Misc. (3-83)	250 mCi	HDL**	13 years	Electronic Component Testing
Terry L. Pruitt				
Misc. (3-83)	250 mCi	HDL**	5 months	Electronic Component Testing
Cobalt-60	250,000 Ci	AFRRI*	1 week	Electronic Component Testing
Stewart Share				
Misc. (3-83)	250 mCi	HDL**	5 years	Electronic Component Testing
Cobalt-60	35,000 Ci	HDL**	1 year	Electronic Component Testing

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Supplement No. 2 continued.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
Donald E. Wortman				
Cs-137	1 Ci	Indiana Univ.	4 years	Calibration
Co-60	1 Ci	Indiana Univ.	4 years	Calibration
Y89, Y90, & Y91	300 mCi	Indiana Univ.	4 years	Research
Mn-56	100 mCi	Indiana Univ.	4 years	Research
Fe-59	100 mCi	Indiana Univ.	4 years	Research
Nd-95	100 mCi	Indiana Univ.	4 years	Research
Ca-47	100 mCi	Indiana Univ.	4 years	Research
Rb-84	100 mCi	Indiana Univ.	4 years	Research
Norman J. Berg				
Cobalt-60	20,000 Ci	HDL**	4 years	Electronic Component Testing
Misc. (3-83)	250 mCi	HDL**	7 years	Electronic Component Testing
Clyde A. Morrison				
Misc. (3-83)	100 Ci	HDL**	1 year	Laser Research

The maximum amounts of radioactivity and the identification of all isotopes handled are extremely difficult to determine. The amounts can only be given as maximum estimates.

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*Armed Forces Radiobiology Research Institute
**Harry Diamond Laboratories
***National Bureau of Standards

SUPPLEMENT #3

Item 10, Form AEC-313, Radiation Detection Instruments.

Type of Instruments	Number Available	Radiation Detected	Sensitivity Range (mR/hr)	Window Thickness (mg/cm^2)	Use
Nuclear Measurements Corp. PC-4 Gas Flow Internal Proportional Counter	1 HDL	Alpha, Beta	Beta Bkgnd ≈46.0 CPM Beta Eff. ≈55%	Alpha Bkgnd ≈0-1 CPM Alpha Eff. ≈44%	Measuring
Baird Atomic Model 135 Scaler-Timer with Shield & End Window G-M Tube	1 (DORF)	Beta, Gamma	---------	1.4	Measuring
Eberline Model 135 Scaler-Timer with Shield & End Window G-M Tube	1 (DORF)	Beta, Gamma	---------	1.4	Measuring
Teletector, Model 6112B GM Tube Survey Meter	2 HDL 5 (DORF)	Beta, Gamma	$0.01-10^6$	----------	Surveying & Monitoring
Eberline E-120 Geiger Counter	1 (DORF)	Beta, Gamma	0.01-50	----------	Surveying & Monitoring
Eberline E-400 Geiger Counter	1 (DORF)	Beta, Gamma	0.01-200	----------	Emergency Instrument
Johnson, GSM-5 Survey Meter, GM Tube	1 (DORF)	Beta, Gamma	0.01-20	----------	Surveying & Monitoring
Nuclear Chicago, 2650 GM Tube	2 (DORF)	Beta, Gamma	0-100	----------	Surveying & Monitoring
Victoreen 490 Thyac III GM Tube	2 HDL	Beta, Gamma	0.01-20	30	Surveying & Monitoring
Victoreen 440 RF/A Ionization Chamber	1 HDL	Gamma	0.1-300	1.0	Surveying & Monitoring
Nuclear Chicago "Cutie Pie" Portable Survey Meter Model 2595	1 HDL	Beta, Gamma	$0.01-10^3$	1.0	Surveying & Monitoring
Nuclear Chicago "Cutie Pie" Portable Survey Meter Model 2595	1 HDL	Beta, Gamma	10^3-10^6	1.0	Surveying & Monitoring

Supplement No. 3 continued.

Item 11, Form AEC-313, Method, Frequency, and Standards Used in Calibrating Instruments Listed Above.

The instruments to be calibrated will be placed at a known distance from a known source. The reading on the meter will be observed in the case of a count rate meter. The calculated values at various distances from the known source will be compared with the observed meter response.

On occasion, at the discretion of the HDL Radiation Protection Officer, certain instruments may be calibrated by others such as the instrument manufacturer, the National Bureau of Standards, or a qualified contractor.

The surveying and monitoring instruments that are in use at HDL will be calibrated at intervals of no longer than 3 months; however, constancy checks will be made frequently.

The surveying and monitoring instruments that are in use at DORF will be calibrated at intervals of no longer than 3 months and will probably be calibrated monthly, which is the schedule followed by Walter Reed Army Medical Center.

The following sources are available for calibration and constancy checks.

a. One Co-60 source, 12.3 mR/h at 1 meter, 26 Jan 1961 (NBS calibrated).
b. One Co-60 source, 1.07 mR/h at 1 meter, 26 Jan 1961 (NBS calibrated).
c. One Co-60 source, 2.58 mR/h at 1 meter, 30 Nov 1972 (US Army calibrated).
d. One Cs-137 source, 32.6 R/h at 1 meter, 2 Mar 1970 (AFRRI calibrated, traceable to NBS).
e. Radium (D+E) check source obtained from the National Bureau of Standards, approximately 28,000 counts/min. alpha plus beta, 23 March 1962.

SUPPLEMENT #4

Item 13, Form AEC-313, Facilities and Equipment.

1. General Information: HDL's main purpose in irradiating electronic equipment is to observe the dynamic response of the equipment during the irradiation; however, some equipment and components will be examined in the laboratory after irradiation. It is pointed out that at any one time, the total activity of materials foreseen as undergoing laboratory examination will be far less than the total license quantity (250 millicuries) being requested in this application. Experience has shown that gamma activity in laboratory examination is much less than 1 mR/hr at one meter; generally, beta, gamma activity at the surface of material will be of the order of 1 to 10 mR/hr or less.

A variety of threshold detectors will be used. Most commonly, sulfur pellets, $S^{32}(n,p)P^{32}$ and $S^{32}(n,a)Si^{28}$; metallic $Al^{27}(n,p)Mg^{27}$ and $Al^{27}(n,a)Na^{24}$; $Mg^{24}(n,p)Na^{24}$; $Zn^{64}(n,p)Cu^{64}$; Radium foils; $In^{115}(n,a)In^{116}$, and iron foils $Fe^{54}(n,p)Mn^{54}$ and $Fe^{56}(n,p)Mn^{59}$. The work involving use of irradiated electronic equipment and threshold detectors will be undertaken at the Harry Diamond Labs, Adelphi, MD; US Army Test & Evaluation Command, Aberdeen Proving Ground; the Armed Forces Radiobiology Research Institute, Bethesda, MD; and the National Bureau of Standards, Gaithersburg, MD.

At present, one specific crystal (laser material) will be activated in a series of steps to a maximum of 100 curies of Tm 170. This work will be undertaken at the National Bureau of Standards Reactor at Gaithersburg, Maryland.

Any usage of materials requested under this license outside of Harry Diamond Laboratories shall be subject to prior approval of all phases of the operation by the Harry Diamond Laboratories' Radiation Protection Officer and the Safety Committee of the installation involved.

2. Specific Information: When necessary, a special area will be set up for the examination of the irradiated electronic equipment. The area will have limited access and will be posted with the proper radiation warning signs as required. Persons conducting examinations in this area will be equipped with survey instruments and will wear film badges (ring and/or torso) as is appropriate.

Forceps, tongs, special handling tools and disposable gloves will be available and will be used when they are needed. It is not intended that personnel perform microscopic examination of components; rather, the components will be mounted in test rigs and the electrical properties of the components will be measured.

No special shielding is required for items 1 and 2. Operating experience has shown that distance and time have been very satisfactory methods of reducing radiation exposure to a very low level. If required, lead bricks are available for shielding and if the situation arose, special shielding apparatus would be designed and built.

Supplement No. 4 continued.

Item 3 (activated crystals) will require special handling and shielding at the maximum curiage requested. The exposure from a 100 curie crystal will be approximately 5.4 roentgen/hour at a distance of 1 foot from a point source. Adequate shields and containers will be furnished and the work constantly monitored.

During the testing program involving use of the materials requested under this license, the materials will be temporarily stored in locked/labeled cabinets located at the test area. The materials placed in locked cabinets will be stored in a manner that will exclude the possibility of creating a "restricted area."

When not in use, the materials requested under this license will be stored in the HDL, Adelphi, MD, Building 504 radioactive materials storage facility. This room is designed for the storage of activated or contaminated equipment and radioactive materials. The room has reinforced concrete walls a minimum of 18 inches thick, is equipped with five storage wells 10½ feet deep, and five storage wells 5½ feet deep. Additionally, the storage room has an HEPA filtered ventilation system, impermeable floors and walls, and is located within the guarded chain link fence which surrounds the HDL/MD site. The door to the room is kept locked and personnel access to the room is under the jurisdiction of the HDL Radiation Protection Officer (RPO). Periodic checks of the storage room are made by the HDL RPO in order to assure that storage activities do not present a radiological hazard.

SUPPLEMENT #5

Item 14, Form AEC-313, Radiation Protection Program.

There is in HDL a Radiation Control Committee composed of the Radiation Protection Officer, the Safety Officer, a representative of the administrative office, and several technical members trained or experienced in the use of radioactive materials.

The Committee is responsible for the formulation of rules and procedures necessary to minimize hazards due to ionizing radiation, and insure compliance with all applicable regulations. The use of the requested material will be under the cognizance of this Committee.

Item 15, Waste Disposal.

Waste disposal will be handled by the US Army Armament Material Readiness Command, Rock Island, Illinois, in accordance with the procedures delineated in applicable Federal and Army Regulations.

DRCSF-P/78-0002 16 January 1978

Director
Nuclear Material Safety and Safeguards
ATTN: Radioisotopes Licensing Branch
US Nuclear Regulatory Commission
Washington DC 20555

Gentlemen:

Forwarded is Harry Diamond Laboratories' application for renewal and amendment of Byproduct Material License Number 19-17250-04.

The following changes are requested in the renewal application:

a. Remove the Diamond Ordnance Radiation Facility, Forest Glen, MD and the Harry Diamond Laboratories, Washington DC site from list of street addresses at which byproduct materials may be used.

b. Add US Army Test and Evaluation Command, Aberdeen Proving Ground MD and the Armed Forces Radiobiology Research Institute, Bethesda MD to the list of street addresses at which byproduct material may be used.

c. Remove Emmert D. McCarry, Frederick W. Balicki, and Mark S. Rothstein from list of users.

d. Add Craig R. Heinbach, Terry L. Pruitt, and Stewart Shara to list of users.

e. Revise list of radiation detection instruments to coincide with Supplement 3 of application.

f. Delete Radioactive Materials Storage Building at Harry Diamond Laboratories, Washington DC site from approved byproduct material storage areas.

g. List Army radioactive waste disposal function at US Army Armament Material Readiness Command, Rock Island IL rather than Aberdeen Proving Ground MD.

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DRCSF-P/78-0002 16 January 1978

Please acknowledge receipt of correspondence on inclosed REC-46 Reply Card (Incl 2).

Sincerely,

2 Incl
as

DARWIN E. TARAS
Chief, Health Physics
Safety Office

CF:
HQDA (DASG-HCH-E) WASH DC 20310 w/incl 1 (dupe)
Dir, DARCOM FSA, Charlestown IN 47111 w/incl

92389

Form AEC-313
(2-73)
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 28-R0027

INSTRUCTIONS.—Complete items 1 through 18 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Materials Branch, Directorate of Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital person, etc. Include ZIP Code and telephone number.)

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1(a). Include ZIP Code.)

Harry Diamond Laboratories, Adelphi, MD
National Bureau of Standards,
Gaithersburg, MD 20760
US Army Test & Evaluation Command,
Aberdeen Proving Ground, MD 21005
Armed Forces Radiobiology Research
Institute, Bethesda, MD 20014

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Nuclear Radiation Effects Laboratory, 200
Applied Physics Branch, 320

3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)

Renew and amend NRC License No. 19-17250-04

4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in items 8 and 9.)

Craig R. Heimbach (Physicist)
Harvey A. Eisen (Physicist)
Paul A. Trimmer (Physicist)
Terry L. Pruitt (Electronic Engineer)
Stewart Share (Physicist)
Donald E. Wortman (Physicist)

5. RADIATION PROTECTION OFFICER. (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in items 8 and 9.)

James E. Stafford (RPO)
James M. McGarrity (Alternate RPO)
Claude A. Rowe (Alternate RPO)
Norman J. Berg (Electrical Engineer)
Clyde A. Morrison (Physicist)

6. (a) BYPRODUCT MATERIAL. (Element and mass number of each.)

Any byproduct material with Atomic Nos. 3-83 inclusive.

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)

1. Activated electronic equipment resulting from radiation effects tests.

2. Isotopes resulting from the activation of threshold detectors.

3. Isotopes resulting from the activation of crystals (laser materials).

Maximum No. of Millicuries

Items 1 & 2 -- 250
Item 3 ------- 100,000

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

Activated electronic equipment will be subject to post irradiation examination. Threshold detectors will be used in dosimetry and/or neutron spectrum measurements.

Activated crystals (laser materials) will be used in the experimental development of laser devices.

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(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 *(Use supplemental sheets if necessary)*

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	See Supplement #1 for resume of individuals named in Item 4. See Supplement #1 for resume of individuals named in Item 5.		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9. EXPERIENCE WITH RADIATION. *(Actual use of radioisotopes or equivalent experience.)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		See Supplement #2 for resume of individuals named in Item 4. See Supplement #2 for resume of individuals named in Item 5.		

10. RADIATION DETECTION INSTRUMENTS. *(Use supplemental sheets if necessary.)*

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm²)	USE (Monitoring, surveying, measuring)
		See Supplement #3			

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS USTED ABOVE.

See Supplement #3

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. *(For film badges, specify method of calibrating and processing, or name of supplier.)*

Film badge service is provided by Lexington-Blue Grass Army Depot, Lexington, Kentucky 40507. Film badges are replaced monthly.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No

See Supplement #4

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

See Supplement #5

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

See Supplement #5

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

License Fee Category $ _____

Fee Enclosed $ _____

HARRY DIAMOND LABORATORIES
Applicant named in Item 1

By: John J. Ramsden
JOHN J. RAMSDEN
COL, OD, Commanding
Title of certifying official

Date _____

APPROVED: JAMES E. STAFFORD (RPO)

WARNING.—18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

* U.S. GPO: 1973—543-126/518

SUPPLEMENT #1

Item 5, Form AEC-313 (See Items 8 and 9)

Item 8, Form AEC-313, Training of Radiation Protection Officer and Users.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
James E. Stafford (Radiation Protection Officer)				
a. Principles	Montgomery College	2 years	Yes	Yes
	DHEW-PHS Training Inst.	1 month	No	Yes
	AFRRI*	2 years	Yes	No
	HDL**	5 years	Yes	No
	NBS***	1 year	Yes	No
b. Measurement	Montgomery College	2 years	Yes	Yes
	DHEW-PHS Training Inst.	1 month	No	Yes
	AFRRI*	1 year	Yes	No
	HDL**	5 years	Yes	No
	NBS***	1 year	Yes	No
c. Mathematics	Montgomery College	2 years	No	Yes
	DHEW-PHS Training Inst.	1 month	Yes	Yes
	NIH Graduate School	1 year	No	Yes
	AFRRI*	2 years	Yes	No
	HDL**	5 years	Yes	No
	NBS***	1 year	Yes	No
d. Biological	Montgomery College	2 years	No	Yes
	Univ. of Maryland	1 year	No	Yes
	Univ. of Iowa	1 year	No	Yes
	AFRRI*	2 years	Yes	No
	HDL**	5 years	Yes	No
James M. McGarrity (Alternate RPO)				
a. Principles	Univ. of Maryland	4 years	No	Yes
	Univ. of Maryland	1 year	Yes	No
b. Measurement	Univ. of Maryland	3 years	No	Yes
	Univ. of Maryland	1 year	Yes	No
c. Mathematics	HDL**	4 years	Yes	No
	Univ. of Maryland	4 years	No	Yes
d. Biological	Univ. of Maryland	1 year	Yes	No
	HDL**	3 years	Yes	No

Supplement No. 1 continued.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
Claude A. Rowe (Alternate RPO)				
a. Principles	Navy Nuclear Power School (Health Physics)	1 year	No	Yes
	US Navy	6 months	Yes	No
	Argonne Nat'l Labs.	1 year	No	Yes
	HDL**	1 year	Yes	No
b. Measurement	Navy Nuclear Power School (Health Physics)	1 year	No	Yes
	US Navy	6 months	Yes	No
	Argonne Nat'l Labs.	1 year	No	Yes
	HDL**	3 years	Yes	No
c. Mathematics	Navy Nuclear Power School (Health Physics)	1 year	No	Yes
	US Navy	6 months	Yes	No
	Argonne Nat'l Labs.	1 year	No	Yes
	Lewis College	2 years	No	Yes
	HDL**	3 years	Yes	No
d. Biological	Navy Nuclear Power School (Health Physics)	1 year	No	Yes
	US Navy	6 months	Yes	No
	Argonne Nat'l Labs.	1 year	No	Yes
Craig R. Heimbach				
a. Principles	HDL**	5 years	Yes	Yes
b. Measurement	HDL**	5 years	Yes	No
	NBS***	3 years	Yes	No
c. Mathematics	HDL**	5 years	Yes	No
	NBS***	3 years	Yes	No
d. Biological	HDL**	1 year	Yes	Yes
Harvey A. Eisen				
a. Principles	HDL**	2 years	Yes	No
	NBS***	5 months	No	Yes
	Univ. of Maryland	1 year	No	Yes
b. Measurement	Univ. of Maryland	2 years	No	Yes
	HDL**	10 years	Yes	No

Supplement No. 1 continued.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
Harvey A. Eisen, continued				
c. Mathematics	Univ. of Maryland	2 years	No	Yes
	HDL**	10 years	Yes	No
d. Biological	HDL**	1 week	Yes	No
	NBS***	5 months	No	Yes
Paul A. Trimmer				
a. Principles	Penn. State Univ.	4 years	No	Yes
	American Univ.	3 years	No	Yes
	HDL**	14 years	Yes	No
b. Measurement	Defense Atomic Support Agency	2 weeks	No	Yes
	NBS Graduate School***	3 months	No	Yes
	HDL**	14 years	Yes	No
c. Mathematics	Penn. State Univ.	4 years	No	Yes
	American Univ.	3 years	No	Yes
	HDL**	14 years	Yes	No
d. Biological	NBS Graduate School***	3 months	No	Yes
Terry L. Pruitt				
a. Principles	HDL**	5 months	Yes	Yes
b. Measurement	HDL**	5 months	Yes	Yes
c. Mathematics	HDL**	5 months	Yes	Yes
d. Biological	HDL**	5 months	Yes	Yes
Stewart Share				
a. Principles	HDL**	5 years	Yes	Yes
b. Measurement	HDL**	5 years	Yes	Yes
c. Mathematics	HDL**	5 years	Yes	Yes
d. Biological	HDL**	1 year	Yes	Yes

Supplement No. 1 continued.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
D. E. Wortman				
a. Principles	Indiana Univ.	4 years	Yes	Yes
	HDL**	2 years	Yes	No
b. Measurement	Indiana Univ.	4 years	Yes	Yes
	HDL**	2 years	Yes	No
c. Mathematics	Indiana Univ.	4 years	Yes	Yes
	HDL**	2 years	Yes	No
d. Biological	Indiana Univ.	1 year	Yes	No
	HDL**	2 years	Yes	No
Norman J. Berg				
a. Principles	HDL**	7 years	Yes	No
b. Measurement	Univ. of Maryland	4 years	No	Yes
	Illinois Inst. of Technology	5 years	No	Yes
	HDL**	7 years	Yes	No
c. Mathematics	Univ. of Maryland	4 years	No	Yes
	Illinois Inst. of Technology	5 years	No	Yes
	HDL**	7 years	Yes	No
d. Biological	HDL**	6 months	Yes	No
C. A. Morrison				
a. Principles	Univ. of Michigan	2 years	No	Yes
	HDL**	1 year	Yes	No
b. Measurement	HDL**	1 year	Yes	No
c. Mathematics	Univ. of Michigan	2 years	No	Yes
	HDL**	1 year	Yes	No
d. Biological	HDL**	1 year	Yes	No

*Armed Forces Radiobiology Research Institute
**Harry Diamond Laboratories
***National Bureau of Standards

SUPPLEMENT #2

Item 9, Form AEC-313, Experience with Radiation for RPO and Users.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
James E. Stafford (Radiation Protection Officer)				
Cobalt-60	39,448 Ci	HDL**	1 year	Routine Health Physics
Cobalt-60	15 Ci	AFRRI*	2 years	Calibration & Dosimetry Studies
Cesium-137	10 Ci	AFRRI*	2 years	Calibration & Dosimetry Studies
Plutonium-239	3 Ci	Montgomery College	2 years	Calibration &
	5 Ci	NBS***	1 year	Dosimetry Studies
Misc. Fission Products	1 uCi to 1 Ci	AFRRI*	2 years	Routine Health
	250 mCi	HDL**	3 years	Physics
Misc. Isotopes	1 uCi to 100 mCi	Montgomery College	2 years	Calibration & Dosimetry Studies
		DHEW-PHS Training Institute	1 month	Calibration & Dosimetry Studies
		NBS***	1 year	Routine Health Physics
		AFRRI*	2 years	Routine Health Physics
		HDL**	3 years	Routine Health Physics

Experience with Radiation for RPO

Mr. Stafford has been employed as a Health Physicist by the Department of the Army, Harry Diamond Laboratories (HDL) for 5 years. During that time, he has been responsible for planning and implementing the HDL radiation safety program. His duties have included the safety analysis of radiation facility design and associated construction techniques in order to ensure the inclusion of adequate shielding and safety support systems for a 50,000 curie Cobalt-60 water-well/in-air irradiator, a 5 MeV Flash X-ray Facility and various industrial X-ray units. In addition, he has been responsible for reviewing, recommending, and monitoring the operating procedures associated with the safe use of ionizing radiation sources at HDL to ensure compliance with applicable regulations and recognized safe practices.

Before transferring to HDL, Mr. Stafford was employed as a Health Physicist by the Armed Forces Radiobiology Research Institute (AFRRI) for a period of 1½ years. In that capacity, he participated in the development and improvement of various radiation protection systems, assisted in development of operational survey procedures for the 4.5 MeV LINAC and a 30,000 Ci Cobalt facility, and performed the tasks necessary to operate, maintain, and calibrate the stack gas monitoring system used to analyze LINAC and Reactor effluents.

Supplement No. 2 continued.

Prior to employment as a Health Physicist by the AFRRI, Mr. Stafford was employed as a Health Physics Technician by the AFRRI for a period of 6 months, by the National Bureau of Standards (NBS) for a period of 1 year, and by Montgomery College for 6 months. While employed as a Health Physics Technician, Mr. Stafford conducted inplant radiological surveys, performed radiological monitoring of exposure facilities and areas associated with a pulsing-steady state reactor, X-ray machines and radioisotope laboratories in order to determine radiological safety procedures for personnel in the area of interest, performed weekly radiation monitoring and contamination surveys of in-plant air, water, and surfaces and recommended decontamination, waste disposal and exposure reduction techniques to investigators when necessary. He was responsible for performing calibration of radiation survey instruments as well as for performing other duties necessary for the implementation of the health physics program at the various places of employment.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
James M. McGarrity (Alternate RPO)				
Cobalt-60	5000 Ci	Univ. of Maryland	2 years	Calibration & Research
Strontium-90	Several mCi	HDL**	3 years	Instrument Calibration
Cesium-137	Several mCi	HDL**	3 years	Instrument Calibration
Pu-Be Neutron Source	1 Ci	Univ. of Maryland	4 years	Instrument Calibration & Sub-Critical Assembly

In addition, as a graduate assistant and reactor staff member for 2 years at the University of Maryland reactor, Dr. McGarrity assisted as an instructor in courses on Reactor Technology which included Health Physics as well as reactor operations. Also, he has 10 years experience at the HDL Triga Reactor Facility (DORF) as Reactor Staff Physicist, advising the Physicist-in-Charge on matters of operation and safety. His work at the University of Maryland included 5 years experience with a PS-100 500 KeV Van de Graaf accelerator.

Claude A. Rowe (Alternate RPO)				
Co-60	39,448 Ci	HDL**	1 year	Chief Operator of Co-60 Water-Well Irradiator
Cs-137	100 mCi	NBS***	3 years	Instrument Calibration
Co-60	10 Ci	NBS***	3 years	Instrument Calibration
Pu-Be	10 Ci	NBS***	3 years	Instrument Calibration
I-131	100 mCi	Univ. of Kentucky Medical Center	5 months	Radiation Therapy

Supplement No. 2 continued.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
Claude A. Rowe, continued.				
Au-198	100 mCi	Univ. of Kentucky Medical Center	5 months	Radiation Therapy
Misc. (3-83)	Various Amounts (few uCi to several hundred mCi)	" "	10 years	Routine Health Physics

Mr. Rowe has acted as the Chief Operator of the HDL Cobalt-60 water-well irradiator for one year. In addition, he was employed as a Health Physicist at the Argonne National Labs for approximately 4 years, the National Bureau of Standards for 3 years, the University of Kentucky Medical Center for 5 months, and the Charleston Navy Shipyard for 2 years.

Craig R. Heimbach				
Californium	2 mCi	NBS***	3 years	Research
Misc. Sealed Byproduct Material Sources	10 mCi	HDL**	5 years	Calibration Studies
Plutonium-239	1 gm Fission Foils	HDL**	5 years	Calibration Studies
Neptunium-237	1 gm Fission Foils	HDL**	5 years	Calibration Studies
Uranium-235 and -238	1 gm Fission Foils	HDL**	5 years	Calibration Studies
Harvey A. Eisen				
Cobalt-60	20,000 Ci	HDL**	10 years	Electronic Component Testing
Misc. (3-83)	1 mCi	HDL**	14 years	Electronic Component Testing
Paul A. Trimmer				
Cobalt-60	20,000 Ci	HDL**	13 years	Electronic Component Testing
Misc. (3-83)	250 mCi	HDL**	13 years	Electronic Component Testing
Terry L. Pruitt				
Misc. (3-83)	250 mCi	HDL**	5 months	Electronic Component Testing
Cobalt-60	250,000 Ci	AFRRI*	1 week	Electronic Component Testing
Stewart Share				
Misc. (3-83)	250 mCi	HDL**	5 years	Electronic Component Testing
Cobalt-60	35,000 Ci	HDL**	1 year	Electronic Component Testing

Supplement No. 2 continued.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
Donald E. Wortman				
Cs-137	1 Ci	Indiana Univ.	4 years	Calibration
Co-60	1 Ci	Indiana Univ.	4 years	Calibration
Y89, Y90, & Y91	300 mCi	Indiana Univ.	4 years	Research
Mn-56	100 mCi	Indiana Univ.	4 years	Research
Fe-59	100 mCi	Indiana Univ.	4 years	Research
Nd-95	100 mCi	Indiana Univ.	4 years	Research
Ca-47	100 mCi	Indiana Univ.	4 years	Research
Rb-84	100 mCi	Indiana Univ.	4 years	Research
Norman J. Berg				
Cobalt-60	20,000 Ci	HDL**	4 years	Electronic Component Testing
Misc. (3-83)	250 mCi	HDL**	7 years	Electronic Component Testing
Clyde A. Morrison				
Misc. (3-83)	100 Ci	HDL**	1 year	Laser Research

The maximum amounts of radioactivity and the identification of all isotopes handled are extremely difficult to determine. The amounts can only be given as maximum estimates.

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*Armed Forces Radiobiology Research Institute
**Harry Diamond Laboratories
***National Bureau of Standards

SUPPLEMENT #3

Item 10, Form AEC-313, Radiation Detection Instruments.

Type of Instruments	Number Available	Radiation Detected	Sensitivity Range (mR/hr)	Window Thickness (mg/cm^2)	Use
Nuclear Measurements Corp. PC-4 Gas Flow Internal Proportional Counter	1 HDL	Alpha, Beta	Beta Bkgnd ≈46.0 CPM Beta Eff. ≈55%	Alpha Bkgnd ≈0-1 CPM Alpha Eff. ≈44%	Measuring
Baird Atomic Model 135 Scaler-Timer with Shield & End Window G-M Tube	1 (DORF)	Beta, Gamma	---------	1.4	Measuring
Eberline Model 135 Scaler-Timer with Shield & End Window G-M Tube	1 (DORF)	Beta, Gamma	---------	1.4	Measuring
Teletector, Model 6112B GM Tube Survey Meter	2 HDL 5 (DORF)	Beta, Gamma	$0.01-10^6$	----------	Surveying & Monitoring
Eberline E-120 Geiger Counter	1 (DORF)	Beta, Gamma	0.01-50	----------	Surveying & Monitoring
Eberline E-400 Geiger Counter	1 (DORF)	Beta, Gamma	0.01-200	----------	Emergency Instrument
Johnson, GSM-5 Survey Meter, GM Tube	1 (DORF)	Beta, Gamma	0.01-20	----------	Surveying & Monitoring
Nuclear Chicago, 2650 GM Tube	2 (DORF)	Beta, Gamma	0-100	----------	Surveying & Monitoring
Victoreen 490 Thyac III GM Tube	2 HDL	Beta, Gamma	0.01-20	30	Surveying & Monitoring
Victoreen 440 RF/A Ionization Chamber	1 HDL	Gamma	0.1-300	1.0	Surveying & Monitoring
Nuclear Chicago "Cutie Pie" Portable Survey Meter Model 2595	1 HDL	Beta, Gamma	$0.01-10^3$	1.0	Surveying & Monitoring
Nuclear Chicago "Cutie Pie" Portable Survey Meter Model 2595	1 HDL	Beta, Gamma	10^3-10^6	1.0	Surveying & Monitoring

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Supplement No. 3 continued.

Item 11, Form AEC-313, Method, Frequency, and Standards Used in Calibrating Instruments Listed Above.

The instruments to be calibrated will be placed at a known distance from a known source. The reading on the meter will be observed in the case of a count rate meter. The calculated values at various distances from the known source will be compared with the observed meter response.

On occasion, at the discretion of the HDL Radiation Protection Officer, certain instruments may be calibrated by others such as the instrument manufacturer, the National Bureau of Standards, or a qualified contractor.

The surveying and monitoring instruments that are in use at HDL will be calibrated at intervals of no longer than 3 months; however, constancy checks will be made frequently.

The surveying and monitoring instruments that are in use at DORF will be calibrated at intervals of no longer than 3 months and will probably be calibrated monthly, which is the schedule followed by Walter Reed Army Medical Center.

The following sources are available for calibration and constancy checks.

a. One Co-60 source, 12.3 mR/h at 1 meter, 26 Jan 1961 (NBS calibrated).
b. One Co-60 source, 1.07 mR/h at 1 meter, 26 Jan 1961 (NBS calibrated).
c. One Co-60 source, 2.58 mR/h at 1 meter, 30 Nov 1972 (US Army calibrated).
d. One Cs-137 source, 32.6 R/h at 1 meter, 2 Mar 1970 (AFRRI calibrated, traceable to NBS).
e. Radium (D+E) check source obtained from the National Bureau of Standards, approximately 28,000 counts/min. alpha plus beta, 23 March 1962.

SUPPLEMENT #4

Item 13, Form AEC-313, Facilities and Equipment.

1. General Information: HDL's main purpose in irradiating electronic equipment is to observe the dynamic response of the equipment during the irradiation; however, some equipment and components will be examined in the laboratory after irradiation. It is pointed out that at any one time, the total activity of materials foreseen as undergoing laboratory examination will be far less than the total license quantity (250 millicuries) being requested in this application. Experience has shown that gamma activity in laboratory examination is much less than 1 mR/hr at one meter; generally, beta, gamma activity at the surface of material will be of the order of 1 to 10 mR/hr or less.

A variety of threshold detectors will be used. Most commonly, sulfur pellets, $S^{32}(n,p)P^{32}$ and $S^{32}(n,a)Si^{28}$; metallic $Al^{27}(n,p)Mg^{27}$ and $Al^{27}(n,a)Na^{24}$; $Mg^{24}(n,p)Na^{24}$; $Zn^{64}(n,p)Cu^{64}$; Radium foils; $In^{115}(n,a)In^{116}$, and iron foils $Fe^{54}(n,p)Mn^{54}$ and $Fe^{56}(n,p)Mn^{59}$. The work involving use of irradiated electronic equipment and threshold detectors will be undertaken at the Harry Diamond Labs, Adelphi, MD; US Army Test & Evaluation Command, Aberdeen Proving Ground; the Armed Forces Radiobiology Research Institute, Bethesda, MD; and the National Bureau of Standards, Gaithersburg, MD.

At present, one specific crystal (laser material) will be activated in a series of steps to a maximum of 100 curies of Tm 170. This work will be undertaken at the National Bureau of Standards Reactor at Gaithersburg, Maryland.

Any usage of materials requested under this license outside of Harry Diamond Laboratories shall be subject to prior approval of all phases of the operation by the Harry Diamond Laboratories' Radiation Protection Officer and the Safety Committee of the installation involved.

2. Specific Information: When necessary, a special area will be set up for the examination of the irradiated electronic equipment. The area will have limited access and will be posted with the proper radiation warning signs as required. Persons conducting examinations in this area will be equipped with survey instruments and will wear film badges (ring and/or torso) as is appropriate.

Forceps, tongs, special handling tools and disposable gloves will be available and will be used when they are needed. It is not intended that personnel perform microscopic examination of components; rather, the components will be mounted in test rigs and the electrical properties of the components will be measured.

No special shielding is required for items 1 and 2. Operating experience has shown that distance and time have been very satisfactory methods of reducing radiation exposure to a very low level. If required, lead bricks are available for shielding and if the situation arose, special shielding apparatus would be designed and built.

Supplement No. 4 continued.

Item 3 (activated crystals) will require special handling and shielding at the maximum curiage requested. The exposure from a 100 curie crystal will be approximately 5.4 roentgen/hour at a distance of 1 foot from a point source. Adequate shields and containers will be furnished and the work constantly monitored.

During the testing program involving use of the materials requested under this license, the materials will be temporarily stored in locked/labeled cabinets located at the test area. The materials placed in locked cabinets will be stored in a manner that will exclude the possibility of creating a "restricted area."

When not in use, the materials requested under this license will be stored in the HDL, Adelphi, MD, Building 304 radioactive materials storage facility. This room is designed for the storage of activated or contaminated equipment and radioactive materials. The room has reinforced concrete walls a minimum of 18 inches thick, is equipped with five storage wells 10½ feet deep, and five storage wells 5½ feet deep. Additionally, the storage room has an HEPA filtered ventilation system, impermeable floors and walls, and is located within the guarded chain link fence which surrounds the HDL/MD site. The door to the room is kept locked and personnel access to the room is under the jurisdiction of the HDL Radiation Protection Officer (RPO). Periodic checks of the storage room are made by the HDL RPO in order to assure that storage activities do not present a radiological hazard.

SUPPLEMENT #5

Item 14, Form AEC-313, Radiation Protection Program.

There is in HDL a Radiation Control Committee composed of the Radiation Protection Officer, the Safety Officer, a representative of the administrative office, and several technical members trained or experienced in the use of radioactive materials.

The Committee is responsible for the formulation of rules and procedures necessary to minimize hazards due to ionizing radiation, and insure compliance with all applicable regulations. The use of the requested material will be under the cognizance of this Committee.

Item 15, Waste Disposal.

Waste disposal will be handled by the US Army Armament Material Readiness Command, Rock Island, Illinois, in accordance with the procedures delineated in applicable Federal and Army Regulations.

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FORM NRC 374A
(5-76)

U. S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSE
Supplementary Sheet

License Number 19-17250-04

Docket or ~~Reference No.~~ 30-12436

Amendment No. 03

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

In accordance with letter dated May 5, 1980, License Number 19-17250-04 is amended as follows:

Condition 14. is amended to read:

14. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application received January 18, 1978; application dated August 11, 1978; and letter dated May 5, 1980. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

JUL 9 1980

Date

For the U. S. Nuclear Regulatory Commission

PAUL R. GUINN
Material Licensing Branch
by

Division of Fuel Cycle and
Material Safety
Washington, D.C. 20555

FORM NRC 374A
(5-76)

U. S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Supplementary Sheet

License Number 19-17256-01

Docket or
Reference No. 30-12436

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

Amendment No. 02

In accordance with application dated August 11, 1978, License Number 19-17256-01 is amended as follows:

Condition 14. is amended to read:

14. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material as described in Items 5, 7, and 9 of this license in accordance with statements, representations, and procedures contained in application received January [illegible], 1977 and application dated August 11, 1978.

Date SEP 2 9 1978

For the U. S. Nuclear Regulatory Commission

by Radioisotopes Licensing Branch

Division of Fuel Cycle and
Material Safety
Washington, D.C. 20555

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Form NRC-374

U. S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSE

Amendment No. 01

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Department of the Army Harry Diamond Laboratories 2. 2800 Powder Mill Road Adelphi, Maryland 20783	In accordance with application received January 18, 1978, 3. License number 19-17250-04 is amended in its entirety to read as follows: 4. Expiration date June 30, 1983 5. Docket or Reference No. 30-12436

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Any byproduct material between Atomic Nos. 3 and 83, inclusive	A. Irradiated electronic equipment and threshold detectors	A. Not to exceed 250 millicuries total
B. Any byproduct material between Atomic Nos. 3 and 83, inclusive	B. Activated laser materials	B. Not to exceed 100 curies total

9. Authorized use

A. Post-irradiation examination of electronic equipment. Dosimetry and neutron spectrum measurements with threshold detectors.
B. To be used in the experimental development of laser devices.

CONDITIONS

10. Licensed material shall be used only at the Harry Diamond Laboratories, Adelphi, Maryland; National Bureau of Standards, Gaithersburg, Maryland; U.S. Army Test and Evaluation Command, Aberdeen Proving Ground, Maryland; and the Armed Forces Radiobiology Research Institute, Bethesda, Maryland.

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

8307210072

License Number 19-17250-04

Docket or
Reference No.

CONDITIONS

Amendment No. 04

(continued)

12. Licensed material shall be used by, or under the supervision of, Craig R. Heimbach, Harvey A. Eisen, Paul A. Trimmer, Terry L. Pruitt, Stewart Share, Donald E. Wortman, Norman J. Berg, Clyde A. Morrison, James E. Stafford, James M. McGarrity, or Claude A Rowe.

13. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Section 71.5, Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material For

14. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with the statements, representations, and procedures contained in application received January 18, 1978.

JUN 7 1978

Date

For the U. S. Nuclear Regulatory Commission

PAUL R. [illegible]

by Radioisotopes Licensing Branch

Division of Materials and Fuel Cycle
Facility Licensing
Washington, D. C. 20555

DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA. 22333

T. Grucci/seb/49340

DRCSF-P/80-0055

22 May 1980

Director
Nuclear Material Safety and Safeguards
ATTN: Radioisotopes Licensing Branch
US Nuclear Regulatory Commission
Washington, DC 20555

Gentlemen:

Forwarded is resume of Mr. Michael D. Funkhouser who is designated new radiation protection officer at Harry Diamond Laboratories replacing Claude Rowe. Request following licenses be amended to reflect change in radiation protection officer:

BML 19-17250-01
19-17250-04
19-17250-05
SNM-348

Please acknowledge receipt of correspondence on inclosed DA form 209 Reply Card.

Sincerely,

DARWIN N. TARAS
Chief, Health Physics
Safety Office

2 Incl
as stated

CF:

HQDA (DASG-PSP-E) Washington, DC 20310
DIR, DARCOM FSA, Charlestown, IN 47111

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MICHAEL D. FUNKHOUSER, Health Physicist, Harry Diamond Laboratories (HDL), Adelphi, Maryland.

a. Education:

(1) B.S. - University of Florida, Gainesville, Florida - 1969. Major: Physics

(2) M.S.A.N.S. - Georgia Institute of Technology, Atlanta, Georgia - 1978. Major: Health Physics

b. Professional Experience:

(1) January 1970 - April 1970
State of Georgia Department of Public Health, 47 Trinity Place, S.W., Atlanta, Georgia.
Sanitarian Trainee - Introduction and Orientation in the Georgia State Public Health Services - Participated in daily classes in preparation of state wide assignment as Sanitarian. Awarded Certification of Achievement, Georgia Department of Public Health Enviromental Health Training.

(2) April 1970 - September 1977
State of Georgia, East Atlanta Regional, County of DeKalb Department of Public Health, 440 Winn Way, Decatur, Georgia.
Senior Sanitarian - Responsible for the application and enforcement of state and county health codes. Conduct routine inspection of food service facilities, school cafeterias, swimming pools, state institutions, and investigate a wide variety of environmental complaints for compliance with state and county rules and regulations. Conduct epidemiological tests, microwave oven examinations, chemical analyses, submit construction and building authorizations, evaluate reports and studies. Consult with food service management on planning and construction; instruct food service personnel on good health practices in food service preparation. Consult with landlords on county housing codes; instruct tenants on housing hygiene and vermin control. Participate in state and county housing, institutional, and community surveys. Prepare and submit reports to state and county commissions. Testify in legal hearings. Present litigation in county courts. Certified Registered Professional Sanitarian 1972.

(3) September 1977 - September 1978
Georgia Institute of Technology, School of Nuclear Engineering, Atlanta, Georgia.
Student - Master of Science in Applied Nuclear Science

(4) October 1978 - October 1979
US Army Communications and Electronics Materiel Readiness Command (CERCOM), Fort Monmouth, New Jersey.
Health Physicist - Responsible for the implementation and participation in health physics srevices for the CERCOM Safety Program. Perform studies of potentially hazardous radiological conditions; submit evaluations and recommendations that minimize health risks to personnel. Identify CERCOM commodities containing radioactive sources; maintain procurement and logistic control measures over ionizing sources. Communicate daily with US Army Depot Radiation Protection Officers on commodity identification, US Nuclear Regulatory Commission Rules and Regulations, and Department of Army Authorizations. Conduct comprehensive radiological surveys of US Army Depots. Prepare and evaluate reports and make recommendations.

MICHAEL D. FUNKHOUSER, Health Physicist

(5) October 1979 - Present
Harry Diamond Laboratories (HDL), 2800 Powder Mill Rd, Adelphi, Maryland, 20783.
Health Physicist - Responsible for radiation and laser protection program at HDL. Enforce Federal and State radiation protection standards. Perform studies and evaluations of potentially hazardous radiological conditions associated with accelerators, flash X-ray, laser, irradiated electronics, kilocurie Cobalt-60, and microcurie/millicurie Atomic Numbers 3-94.

MICHAEL D. FUNKHOUSER, Health Physicist

c. Formal Training:

Type of Training	Where Trained	Duration of Training	On the Job	Formal Courses
(1) Principles	Georgia Tech	1 year	No	Yes
	University of Florida	2 years	No	Yes
	HDL*	5 months	Yes	No
(2) Measurements	Georgia Tech	1 year	No	Yes
	Neely Research Reactor	3 months	Yes	No
	Tobyhanna Army Depot	2 weeks	Yes	No
	HDL*	5 months	Yes	No
(3) Mathematics	Georgia Tech	1 year	No	Yes
	U of Florida	2 years	No	Yes
	HDL*	5 months	Yes	No
(4) Biology	Georgia Tech	1 year	No	Yes
	U of Florida	2 years	No	Yes
	HDL*	5 months	Yes	No

d. Experience with Radiation:

Isotope	Maximum Amount	Duration of Experience (years)	Type of Use
Atomic Nos 1-82	uCi-mCi	0.3	Leak Tests/Surveys/ Calibration Studies
Hydrogen-3	100 uCi	1	Wipe tests
Carbon-14	10 uCi	2	Spectroscopy
Cobalt-60	1 uCi	1	Spectoscopy
Cobalt-60	500 Ci	1	Calibration studies
Cobalt-60	12,000 Ci	1	Chemical dosimetry
Cobalt-60	20,000 Ci	0.3	Leak tests/surveys
Strontium-90	50 uCi	1	Spectroscopy
Yttrium-90	50 uCi	1	Spectroscopy
Indium-116	10 uCi	1	Activation studies
Gold-198	5 uCi	1	Spectroscopy
Bismuth-212	20 uCi	1	Spectroscopy
Lead-212	20 uCi	1	Spectroscopy
Radium-226	50 uCi	1	Calibration studies
Antinides	1 uCi	1	Chemical separation studies
Lanthanides	1 uCi	1	Chemical separation studies
Thorium Series	1 uCi	1	Radionuclide identification studies
Transuranics	4 Ci	0.3	Leak tests/surveys
Uranium Series	1 uCi	1	Radionuclide ident studies

*Harry Diamond Laboratories

~~23-050~~

d. Experience with Radiation Producing Machines

Radiation Machine	Duration of Experience (yrs)	Type of Use
Aurora (Harry Diamond Labs)	0.3	Surveys/dosimetry
Betatron (Emory U, Atlanta,GA)	1	Dosimetry and phantom studies
Febetron (Harry Diamond Labs)	0.3	Surveys/dosimetry
Medical Linear Accelerator (Emory U)	1	Dosimetry and phantom studies
Microwave ovens	7	Surveys
X-ray radiography (Harry Diamond Labs)	0.3	Surveys/dosimetry

DRCSP-P/78-0002 12 May 1978

Director
Nuclear Material Safety and Safeguards
ATTN: Radioisotopes Licensing Branch
US Nuclear Regulatory Commission
Washington DC 20555

Gentlemen:

This office has been informed that Harry Diamond Laboratories' application for renewal of Byproduct Material License Number 19-17250-04, dated 16 Jan 78, was not received by Radioisotopes Licensing Branch of the Commission.

Accordingly, this office has reproduced copies of Harry Diamond Laboratories' application along with our forwarding letter and is submitting application for your review and approval. It was not the intent of this office to submit an untimely filed application for renewal of license.

Please acknowledge receipt of correspondence on inclosed NRC-46 Reply Card (Incl 2).

Sincerely,

2 Incl
as

DARWIN H. TARAS
Chief, Health Physics
Safety Office

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FORM NRC-374A
(5-76)

Page 1 of 1 Pages

U. S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Supplementary Sheet

License Number 19-17250-05

Docket or ~~Reference No.~~ 30-13840

Amendment No. 05

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

In accordance with letter dated January 3, 1981, License Number 19-17250-05 is amended as follows:

Condition 17. is amended to read:

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application received April 11, 1977; applications dated September 22, 1977, January 12, 1978, March 22, 1979; letters dated May 5, 1980, and January 3, 1981. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

8103090
410002

MAR 18 1981

Date

For the U. S. Nuclear Regulatory Commission

Material Licensing Branch

by

Division of Fuel Cycle and Material Safety
Washington, D.C. 20555

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FORM NRC 374A
(5-76)

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Supplementary Sheet

License Number 19-17250-05

Docket or
Reference No. 30-12840

Amendment No. 04

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

In accordance with letter dated May 5, 1980, License Number 19-17250-05 is amended as follows:

Condition 17. is amended to read:

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application received April 11, 1977; applications dated September 22, 1977, January 12, 1978, and March 22, 1979; and letter dated May 5, 1980. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

8008250310

JUL 15 1980

Date

For the U.S. Nuclear Regulatory Commission
PAUL [illegible]
Material Licensing Branch

by

Division of Fuel Cycle and
Material Safety
Washington, D.C. 20555

Form NRC 374
(9-78)

U. S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSE

Amendment No. 07

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Department of the Army Harry Diamond Laboratories 2. 2800 Powder Mill Road Adelphi, Maryland 20783	In accordance with application dated March 22, 1978 3. License number 19-17757-05 is amended in its entirety to read as follows: 4. Expiration date November 30, 1982 5. Docket or ~~Reference No.~~ 30-12840

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Cobalt 60	A. Neutron Products, Inc. Model 1000 sealed sources which are doubly encapsulated in accordance with Neutron Products, Inc. procedure No. 2	A. Not to exceed 1,000 curies per source and 17,000 curies total

9. Authorized use

A. For use in a customer's water pool irradiator for the irradiation of materials excluding explosives and flamable materials.

CONDITIONS

10. Licensed material shall be used only at the licensee's address stated in Item 2 above.

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

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(continued)

17. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's radiation control committee. Each individual user designated by the radiation control committee shall complete the training described in the licensee's application dated September 27, 1977.

18. Sealed sources containing licensed material shall not be opened.

19. A. Each sealed source containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

B. The test shall be capable of detecting the presence of 0.05 microcurie of contamination on the test sample. The test sample shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

C. If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region I, Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.

D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

20. After installation of the irradiator and Cesium 137 or Cobalt 60 source and prior to initiation of the irradiation program, a radiation survey shall be conducted to determine radiation levels around, above, and below the irradiator with the source in the irradiate position and with the source in the shielded position. A detailed report of the results of the survey shall be sent to the Licensing Management Branch, Division of Fuel Cycle and Material Safety, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, not later than thirty (30) days following installation of the source. A copy of such report shall also be sent to the U. S. Nuclear Regulatory Commission, Region I, Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, Pennsylvania 19406.

FORM NRC-374A
(5-76)

U. S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Supplementary Sheet

License Number 19-17250-05

CONDITIONS

Docket or
Reference No.

(continued)

Amendment No. 03

16. Written instructions contained in the licensee's undated application received April 11, 1977, shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of licensed material. Any changes in these instructions shall have the prior approval of the License Management Branch, Division of Fuel Cycle and Material Safety, U.S. Nuclear Regulatory Commission, Washington, D. C. 20555.

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 9 of this license in accordance with statements, representations, and procedures contained in application received April [illegible] and applications dated September 22, 1977, January 12, 1978, and March 22, 1979. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U.S. Nuclear Regulatory Commission

(Original Signed By)
PAUL R. GUINN
License Management Branch

by

MAY 18 1979

Date

Division of Fuel Cycle and
Material Safety
Washington, D.C. 20555

Form NRC-374

U. S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSE

CORRECTED COPY

030-12840

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

4E

Licensee	
1. Department of the Army Harry Diamond Laboratories 2. 2800 Powder Mill Road Adelphi, Maryland 20783 VOID	3. License number 19-17250-05 4. Expiration date November 30, 1982 5. Docket or Reference No.

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Cobalt 60	A. Neutron Products, Inc. Model [illegible]C5 Sealed Sources which have doubly encapsulated in accordance with Neutron Products, Inc. procedure No. 2 VOID	A. 37,296 curies, No single source to exceed 1,554 curies

9. Authorized use

A. For use in a water pool irradiator for the irradiation of materials excluding explosives and flammable materials.

CONDITIONS

10. Licensed material shall be used only at the licensee's address stated in Item 2 above.

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MATERIALS LICENSE

Supplementary Sheet

License Number 12-17250-05

CORRECTED COPY
CONDITIONS

Docket or
Reference No.

(continued)

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

12. Licensed material shall be used by, or under the supervision of, Klaus G. Ferris, Claude A. Rowe, Joseph D. Silverstein, Harvey A. Risen, Paul A. Trimmer, James M McCarrity, or Dale Schallhorn. Underwater irradiations may be conducted in accordance with procedures contained in the licensee's undated application received April 11, 1977, by individuals who have been approved by the licensee's Radiation Control Committee in accordance with procedures contained in the licensee's letter dated September 22, 1977.

13. Sealed sources containing licensed material shall not be opened.

14. Written instructions contained in the licensee's undated application received April 11, 1977 shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of licensed material. Any changes in these instructions shall have the prior approval of Radioisotopes Licensing Branch, Division of Fuel Cycle and Material Safety, U. S. Nuclear Regulatory Commission.

15. A. Each sealed source containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

B. The test shall be capable of detecting the presence of 0.05 microcurie of contamination on the test sample. The test samples shall be taken from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

MATERIALS LICENSE

Supplementary Sheet

License Number 19-17250-05

CORRECTED COPY

Docket or
Reference No.

15. continued

C. If the test reveals the presence of 0.05 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U.S. Nuclear Regulatory Commission, Region I, Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.

D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

16. After installation of the irradiator and Cobalt 60 or Cesium 137 source and prior to initiation of the irradiation program, a radiation survey shall be conducted to determine the maximum radiation levels in each area adjoining the irradiation room. A detailed report of the results of the surveys shall be sent to the Radioisotopes Licensing Branch, U. S. Nuclear Regulatory Commission, D. C. 20555, not later than thirty (30) days following installation of the source. A copy of such report shall also be sent to Region I, Office of Inspection and Enforcement, U. S. Nuclear Regulatory Commission, 631 Park Avenue, King of Prussia, Pennsylvania 19406.

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application received April 11, 1977, as amended by letter dated September 22, 1977.

For the U. S. Nuclear Regulatory Commission

Date

by Radioisotopes Licensing Branch
Division of Materials and Fuel Cycle
Facility Licensing
Washington, D. C. 20555

FORM NRC-374A
(5-76)

U. S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Supplementary Sheet

License Number 19-17[illegible]-[illegible]

Docket or
Reference No. 30-12480

Amendment No. 12

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

In accordance with application dated August 11, 1978, License Number 19-17[illegible]-[illegible] is amended as follows:

Condition 17. is amended to read:

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed materials as described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application received April 11, 1974, as amended by letter dated September 22, 1977; and applications dated January 12, 1978 and August 11, 1978.

Dupe of

SEP 29 1978

Date

8008280679

For the U. S. Nuclear Regulatory Commission

[illegible]

by Radioisotopes Licensing Branch

Division of Fuel Cycle and
Material Safety
Washington, D.C. 20555

FORM NRC-374C
6-75

U. NUCLEAR REGULATORY COMMISSION

Page 1 of 1 Pages

MATERIALS LICENSE

Supplementary Sheet

License Number 19-17250-05

Docket or Reference No. 30-12814

Amendment No. 01

Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, Maryland 20783

In accordance with application dated January 12, 1978, License Number 19-17250-05 is amended as follows:

Items 6, 7, and 8 are amended to read:

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Cobalt 60	A. Neutron Products, Inc. Model 12CC5 Sealed Sources which have doubly encapsulated in accordance with Neutron Products, Inc. procedure No. 2	A. 37,296 curies, No single source to exceed 1,554 curies

Conditions 14. and 17. are amended to read:

14. Written instructions contained in the licensee's undated application received April 11, 1977, as amended January 12, 1978 shall be followed and a copy of these instructions shall be made available to each individual using or having responsibility for use of licensed material. Any changes in these instructions shall have the prior approval of the Radioisotopes Licensing Branch, Division of Fuel Cycle and Material Safety, U.S. Nuclear Regulatory Commission.

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application received April 11, 1977 as amended by letter dated September 22, 1977, and application dated January 12, 1978.

For the U. S. Nuclear Regulatory Commission

[illegible] C. Combs

by Radioisotopes Licensing Branch

Division of Materials and Fuel Cycle Facility Licensing
Washington, D. C. 20555

Date MAY 1 5 1978

Dupe of 8305080306

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