070- 00378

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DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY LABORATORY COMMAND
2800 POWDER MILL RD., ADELPHI, MD 20783-1145

REPLY TO
ATTENTION OF
AMCSF-P(89-0095)
SLCIS-RK (385-11m)

25 AUG 1989

MEMORANDUM THRU Commander, U.S. Army Materiel Command, ATTN: AMCSF-P, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001 28 Aug 89

FOR U.S. Nuclear Regulatory Commission, Region I, Nuclear Materials Section B, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Request for Renewal and Amendment to License SNM-348

1. The following information is submitted for the renewal and amendment of SNM License 348, issued to the Department of the Army, Harry Diamond Laboratories. Information is submitted in accordance with the requirements of 10 CFR 70.22.

a. Licensee: Department of the Army
Harry Diamond Laboratories
2800 Powder Mill Road
Adelphi, MD 20783-1197

b. Use of Material: There has been no change in the use of the materials since the last renewal request. Harry Diamond Laboratories no longer has a need for the material. The material is being held in secure storage awaiting either transfer to an activity licensed to possess the material, or return to the Department of Energy as required.

c. Period of License: Request that the license be renewed for a period of five (5) years.

d. Material: There has been no change in the material inventory since the last renewal request. Therefore request that the license be renewed to include the following material, all of which is in storage awaiting transfer or return to DOE:

Material	Encapsulated Calibration Sources	Fission Foils	Total
Pu-239	12.96 mgms	-----	12.96 mgms
	----	67.95 gms	67.95 gms
Np-237	----	11.89 gms	11.89 gms

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Material	Encapsulated Calibration Sources	Fission Foils	Total
Dep Uranium	--	25.00 gms	25.00 gms
Uranium-235	--	22.07 gms	22.07 gms
Uranium-238	--	137.04 gms	137.04 gms

See enclosure 1 for fission foil configuration. The Pu-239 calibration sources are contained within 1 Reuter Stokes, model RSN-48-M1 Fast Neutron Counter, and 3 Reuter Stokes Model 036J Fast Neutron Counter.

e. Training and Experience: The personnel authorized to access the foils has not changed. See enclosure 2 for resumes of training and experience. Access will only be required to perform leak testing and inventory.

f. Facilities and Equipment:

(1) Instrumentation: The instrumentation listed in enclosure 3 is available when performing inventory, survey, or leak testing of the subject material. All portable instrumentation is calibrated quarterly by Radiation Service Organization of Laurel, Maryland, MD license 33-021-01. For PC-4 calibration procedures, see information submitted in support of BML 19-17250-05, docket number 030-12840. Calibration of the PC-4 is performed using a calibrated Am-241 source, thus allowing for alpha radiation measurement.

(2) Storage/Security Provisions: There has been no change in the storage and security provisions since the last renewal request. The foils are stored in the radioactive materials storage facility, building 504, at Harry Diamond Laboratories, Adelphi, Maryland. This room is designed for the storage of radioactive materials. The room has reinforced concrete walls a minimum of 18 inches thick. Additionally, the storage room has a HEPA filtered ventilation system, impermeable floors and walls, and is located within the guarded chain link fence that surrounds the Harry Diamonds Laboratories site. The door to the room is kept locked and personnel access to the room is under the jurisdiction of the Radiation Protection Officer (RPO). The status of the storage room door is constantly monitored electronically by the Guard Force. Periodic surveys of the storage room are performed by the RPO to ensure that the

storage activities do not present a radiological hazard. The foils are housed inside a specially fabricated plywood cabinet lined with 1/8 inch thick lead. This cabinet is kept locked, and only the RPO has the key to the cabinet. All foils are separated with plexiglass racks inside the plywood cabinet.

(3) Handling Devices: Forceps, tongs, and special remote handling tools are available if needed. Lengths vary from 12 inches to 48 inches. Handling of the subject material is only necessary during leak testing and upon any transfer in the future. A variety of lead shielding containers (pigs) are also available if needed.

g. Procedures:

(1) Leak testing will be performed every three months by Michael Borisky (RPO), or Harvey Eisen (ARPO). Leak testing will be performed by wiping surfaces in close proximity to the foils with a dry filter paper, or cotton swab. The tests will be analyzed on a model PC-4, Nuclear Measurements Corporation, internal proportional counter. Calibration of the PC-4 will be performed using a calibrated Am-241 source.

(2) Personnel performing leak testing, inventory, and survey will be equipped with U. S. Army film badges of TLD dosimeters provided monthly by the U. S. Army Ionizing Radiation Dosimetry Center, Lexington, Kentucky. Furthermore, a survey meter will be used during leak testing, inventory, and survey to monitor personnel exposure. Plastic gloves will be used during leak testing.

(3) In the event that transfer of the material is desired, appropriate coordination with NRC and DOE will be made. Transfer will be made only to and activity NRC licensed to possess the material, and transportation will be accomplished in accordance with DOT regulations.

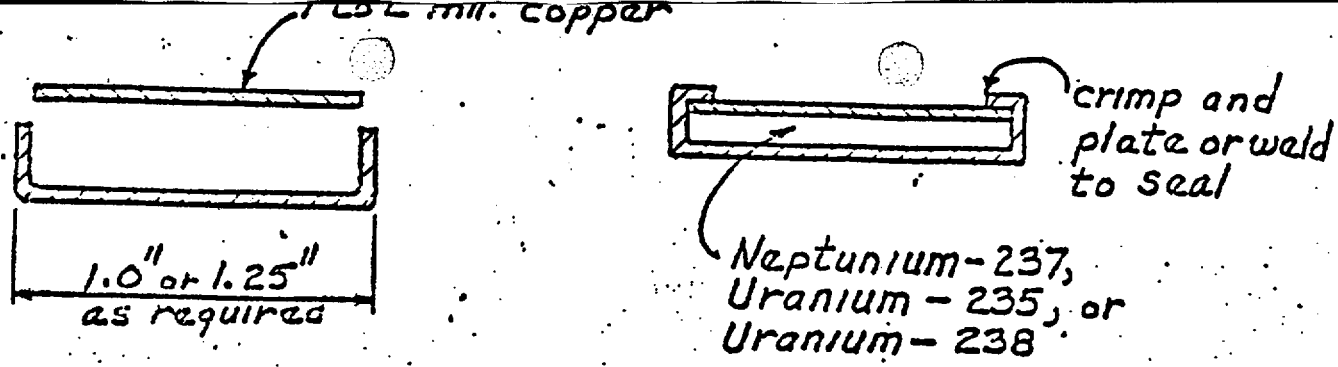
SLCIS-RK
SUBJECT: Request for Renewal and Amendment to License SNM-348

2. If any additional information is needed, please contact Michael Borisky, Radiation Protection Officer, at (202) 394-3446.

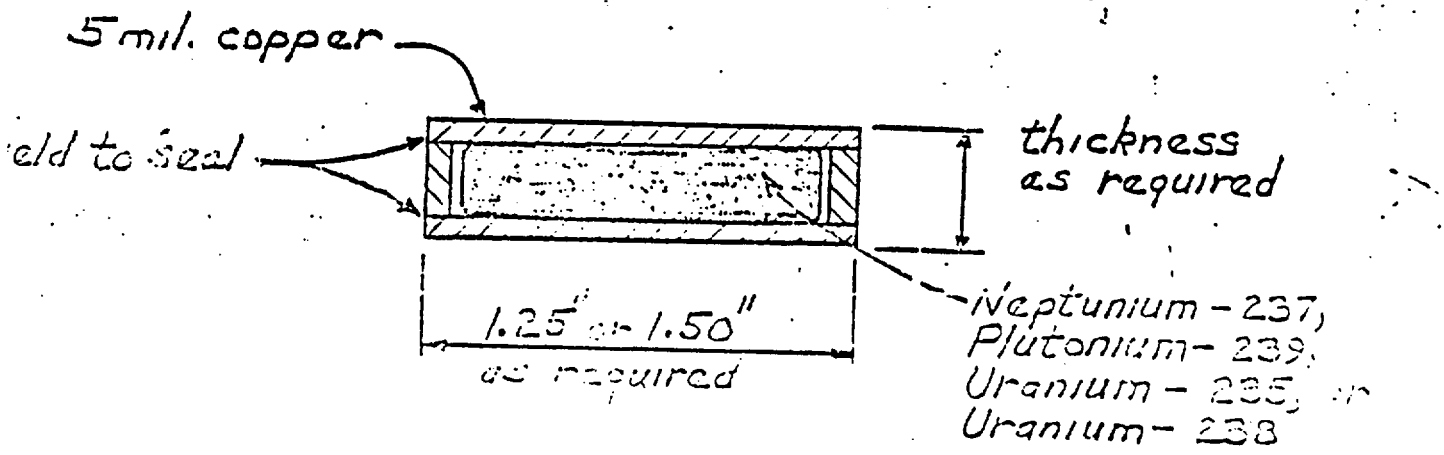
3 Encls

STUART M. MARCUS
Director, Installation
Support Activity

CF:
SLCIS-IC, COL Young



ITEM-A



ITEM-B

FISSION FOIL CONTAINERS

SKETCH SHOWING METHOD OF FABRICATION OF CONTAINERS FOR FISSION FOILS

FIGURE 1.

TRAINING AND EXPERIENCE

MICHAEL BORISKY M.H.S. Radiation Health Science, Johns Hopkins School of Hygiene and Public Health, 1985
B.A. Biological Sciences, University of Maryland, 1977

TYPE OF TRAINING	WHERE TRAINED	DURATION	ON THE JOB	FORMAL
a. Principles	Johns Hopkins	2 years	no	yes
	Univ of Md	1½ years	no	yes
	USA Chemical School	1 month	yes	yes
b. Measurement	Johns Hopkins	2 years	no	yes
	Univ of Md	1½ years	no	yes
	USA Chemical School	1 month	yes	yes
c. Mathematics	Johns Hopkins	2 years	no	yes
	Univ of Md	2 years	no	yes
	USA Chemical School	1 month	yes	yes
d. Biological	Johns Hopkins	2 years	no	yes
	Univ of Md	4 years	no	yes
	USA Chemical School	1 month	yes	yes

DR. HARVEY EISEN (Alternate Radiation Protection Officer)

TYPE OF TRAINING	WHERE TRAINED	DATE	HOURS**	ON THE JOB	FORMAL COURSE
a. Principles	Univ of Md (undergraduate)				
	General Physics (10%)*	Sep 57	7	no	yes
	General Physics (10%)	Feb 58	7	no	yes
	Intro to Nuc Tech (20%)	Sep 58	8	no	yes
	Heat Power-Nuc and Chem (10%)	Feb 60	6	no	yes
	Univ of Md (graduate)				
	Modern Physics (10%)	Sep 60	4	no	yes
	Nuc Tech Lab (50%)	Sep 60	21	no	yes
	Nuc Eng Sem (20%)	Feb 61	3	no	yes
	Spec Prob Nuc Eng (20%)	Feb 61	6	no	yes
	Nuc Pow Use Nuc Rad (50%)	Feb 61	15	no	yes
	Nuc Reactor Eng (50%)	Sep 61	21	no	yes
	Nuc Reactor Eng (50%)	Feb 62	21	no	yes
	Nuc Pow Use Nuc Rad (50%)	Sep 62	21	no	yes
	Nuc Eng Res (20%)	Sep 62	3	no	yes
	Sem in Nuc Energy (20%)	Feb 63	3	no	yes
	Nuc Eng Research (20%)	Feb 63	3	no	yes
	Nuc Eng Research (20%)	Sep 63	3	no	yes
	Nuc Eng Research (20%)	Sep 64	3	no	yes
	Sem in Nuc Eng (20%)	Sep 64	3	no	yes
	Nuc Eng Research (20%)	Feb 65	3	no	yes

*percentage of course applicable to category of training
**hours of the course applicable to category of training

Encl 2

TRAINING AND EXPERIENCE

DR. HARVEY EISEN (Alternate Radiation Protection Officer)

TYPE OF TRAINING	WHERE TRAINED	DATE	HOURS**	ON THE JOB	FORMAL COURSE
a. Principles continued	Sem in Nuc Eng (20%)	Feb 65	3	no	yes
	Radiation Shielding (50%)	Sep 66	21	no	yes
	Nuc Reactor Dynamics (10%)	Feb 67	4	no	yes
	Nuc Eng Research (20%)	Feb 67	3	no	yes
	National Bureau of Standards (NBS)/Harry Diamond Labs (HDL)				
	Radiation Safety Course	1960	6	yes	yes
	Medical Self Help Course	1965	4	yes	yes
	Safety Aspects of Ionizing Radiation Source Use	1977	4	yes	yes
b. Mathematics	Univ of Md (undergraduate)				
	General Physics (20%)	Sep 57	14	no	yes
	Diff Equations	Sep 57	42	no	yes
	Basic Elect Eng (20%)	Feb 58	8	no	yes
	Intro to Nuc Tech (20%)	Sep 58	8	no	yes
	Univ of Md (graduate)				
	Heat Power-Nuc and Chem (20%)	Apr 60	12	no	yes
	Rad Shield Energy Dep (50%)	Sep 66	21	no	yes
	Nuc Reactor Dynamics (50%)	Feb 67	21	no	yes
	George Washington University				
	Math for Sci and Eng	1959	42	no	yes
	NBS/HDL				
	Radiation Safety Course	1960	6	yes	yes
	Saf Asp of Ion Rad Use	1977	1	yes	yes
c. Measurement	Univ of Md (undergraduate)				
	General Physics (5%)*	Sep 57	4	no	yes
	General Physics (5%)	Feb 58	4	no	yes
	Basic Elect Eng (20%)	Feb 58	14	no	yes
	Alt Current Circuits (10%)	Sep 58	6	no	yes
	Elect and Magn (20%)	Sep 58	8	no	yes
	Intro to Nuc Tech (20%)	Sep 58	8	no	yes
	Eng Elect (20%)	Feb 59	11	no	yes
	Applied Elect (20%)	Feb 60	3	no	yes
	Heat Power-Nuc and Chem (10%)	Feb 60	6	no	yes

** percentage of course applicable to category of training
* hours of the course applicable to category of training

TRAINING AND EXPERIENCE

DR. HARVEY EISEN (Alternate Radiation Protection Officer)

TYPE OF TRAINING	WHERE TRAINED	DATE	HOURS	ON THE JOB	FORMAL COURSE
c. Measurement continued	Univ of Md (graduate)				
	Nuc Tech Lab (50%)	Sep 60	28	no	yes
	Nuc Pow Use of Nuc Rad (20%)	Sep 60	6	no	yes
	Nuc Pow Use of Nuc Rad (20%)	Sep 62	6	no	yes
	Rad Shield Energy Dep (10%)	Sep 66	4	no	yes
	Nuc Reactor Dynamics (20%)	Feb 67	8	no	yes
	NBS/HDL				
	Radiation Safety Course	1960	6	yes	yes
	Saf Asp Ion Rad Use	1977	1	yes	yes
d. Biology	Univ of Md (graduate)				
	Nuc Tech Lab (10%)	Sep 66	6	no	yes
	Rad Shield Energy Dep (10%)	Sep 66	4	no	yes
	NBS/HDL				
	Radiation Saf Course	1960	6	yes	yes
	Medical Self Help Course	1965	12	yes	yes
	Sef Asp of Ion Rad Use	1977	1	yes	yes

TRAINING AND EXPERIENCE

MICHAEL J. BORISKY (Radiation Protection Officer)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
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	uCi's	Ft Meade, MD	1 year	Self-luminous devices
Co-60	15 kCi	Harry Diamond Laboratories	7 years	Irradiator facility

In addition, Mr. Borisky has been performing routine Health Physics functions on the 10 MV AURORA Flash X-ray Facility, the 4 MV Flash X-ray HIFX Facility, and various enclosed and non-enclosed x-ray sources for the past 7 years while at Harry Diamond Laboratories.

DR. HARVEY EISEN (Alternate Radiation Protection Officer)

PhD Nuclear Engineering
BS Electrical Engineering

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Co-60	40,000 Curies	Harry Diamond Laboratories	20 years	Radiation effects stud.
Triga Reactor	250 kW	General Atomic	3 years	Radiation effects stud.
Triga Reactor	250 kW	Harry Diamond Laboratories DORF Facility	7 years	Radiation effects stud.

In addition to the above experience, Dr. Eisen also served for 5 years as an active member of the Diamond Ordnance Reactor Facility (DORF) Triga Reactor Safeguards Committee. Dr. Eisen is currently serving as a member of the HDL Radiation Control Committee.

Dr. Eisen has also gained radiation worker experience from his occasional use of particle accelerators over the years. Dr. Eisen's occasional use of particle accelerators includes the following: 12 years with HDL's 10 MV AURORA Flash X-ray Facility; 17 years with HDL's 4 MV HIFX Flash X-ray Facility; 12 years with NRL's 10-40 MV LINAC linear accelerator; and 2 years with the NBS/AFRRI 2 MV Van de Graff Facility.

PROFESSIONAL EXPERIENCE

May 1973 to present
Harry Diamond Laboratories, Adelphi, MD

Supervises a section studying nuclear radiation effects on electronics. Studies include both experimental and analytical work, ranging from component studies to systems analyses, including radiation effects field testing. These studies require a knowledge of radiation transport, use of reactors and other ionizing radiation sources, radiation dosimetry, modern electronic components and circuitry, and radiation effects mechanisms. Responsibilities include both technical and administrative supervision of the research group, including new program development, funding, and research. Currently manages a DOD-wide radiation effects information center, and acts as a consultant to other Army project offices and agencies.

Nov 1971 to May 1973
Harry Diamond Laboratories, Adelphi, MD

Senior member of research groups studying radiation effects on semiconductor devices. Co-author of a major survey on the status of knowledge of radiation effects on MOS technology devices. Served as a member of several advisory panels and working groups and committees to other government agencies. Contributed to thermonuclear shock studies and was a Project Officer on a Nevada Test Site underground test.

Sept 1970 to Nov 1971
National Bureau of Standards, Wash., DC

Developed a technique for using radiochromic dye films for making absolute, high precision measurements of energy deposited by radiation. Measured electron energy deposition profiles in a variety of targets and made comparisons to theoretical calculations. These measurements were the first of their kind, and qualified for Dr. Eisen's PhD thesis. Results were presented at an IAEA Symposium in Vienna.

June 1965 to Sept 1970
Harry Diamond Laboratories, Adelphi, MD

Responsible for the laboratory and field testing in an investigation of transient radiation susceptibility and hardening of transistors. Obtained and used several complex computer radiation energy deposition codes. Served as technical monitor for large development contracts. Developed the first method of measuring the free surface motion of pulse-radiation excited materials.

June 1960 to June 1965
Harry Diamond Laboratories, Adelphi, MD

Served as an instrumentation engineer for radiation effects experiments. Responsible for planning, executing, and reporting on original experiments, consulting on new instrumentation requirements for others, and planning and choosing new instrumentation equipment.

Radiation Detection Instruments

›E	MANUFACTURER	MODEL	# AVAIL	DETECTS	SENSITIVITY
›portional	Nuclear Meas Corp	PC-4	1	alpha, beta	10-3X10^6 dpm
I	Ludlum Meas Inc.	2	2	beta, gamma	0.1-50 mR/hr
I	Ludlum Meas Inc.	3	1	alpha, beta gamma	0.1-200 mR/hr 0-5000 cpm
I	Victoreen	490	1	beta, gamma	0.05-200 mR/hr
ı Chamber	Victoreen	440-RF	1	gamma	1-300 mR/hr
ı Chamber	Keithley Inst Co	36150	1	gamma, beta	0-20 R/hr
I	Eberline Inst Co	6112B	2	gamma, beta	0.01-10^6 mR/hr
I	Xetex, Inc.	415A	2	gamma	1-10000 mR