Form AEC-313			MMISSION		Form approved.
(8-85)	APPLICATIU	IN FOR BYFRUDUCI	MATERIAL LICE	NSE R REDR	Budget Bureau No. 38-R
INSTRUCTIONS only Items 1 mation previo Tennessee, A application, t of an AEC B	s: Complete Items 1 through 11 provided ously submitted. Ma ttention: Isotopes he applicant will rece oproduct Material Li	through 19 if this is that with respect to all two copies to: U. S Extension, Division ive an AEC Byprodu cense are contained in	a new application the other items to b. Atomic Energy ( of Civilian Application ct Material Licens n Title 10, Code o	ere has been firston, blication. e. General 1 f Federal R	To change in the in T. O. Box E, Oak R Upon approval of requirements for issue egulations, Part 30.
1. (a) NAME AND SHIF (Institution, firm National 70 Memor Cambridg	PING ADDRESS OF APPLICANT hospital, person, etc.) Research Cor ial Drive e 42, Massach	poration usetts	(b) ADDRESS(ES) AT WHIG (1f different from shipp)	H BYPRODUCT M ng address)	IATERIAL WILL BE USED
2 DEPARTMENT TO L	SE BYPRODUCT MATERIAL			•	
3. INDIVIDUAL USER	(Name and title of individual(s) v	vho will use or directly supervise u	se of byproduct material)		ج
G. Frede	rick Vandersc	hmidt	• ·	•	
4. RADIOLOGICAL SAN	ETY OFFICER (Name of person	qualified in radiological safety, if (	other than individual user)		
5. PREVIOUS LICENSE	OR AUTHORIZATION NUMBE	R (If this is an application for ren	ewal of a license for byprodu	t material obtained	under a prior license or authori
radioisotope procuren	ient)		· · · ·		
none					•
6 BYPDODUCT MATT	BYPRODU	CT MATERIAL OR IR	RADIATION SERVI	CE DESIREI	
V. DIFRUDUCI MAIL	``````````````````````````````````````	Zr or Ti hydr	ride nladuoe	CURIES THAT	YOU WILL POSSESS AT ANY C
н3		from U.S. Rac	lium Corn		
••	· · ·	(See enclosed	dwgs.)	20,0	UU MC
10. (a) DESCRIBE PUR is to be used in or The mater	POSE FOR WHICH BYPRODUC manufactured as a "sealed source ial will be u	STATEMEN T MATERIAL WILL BE USED. "complete Supplement B in addi Sed as a sourc	NT OF USE (If material is for "human us is to this item.) e of ioniza	e" complete Suppl	ement A in lieu of this item. I experimental
10. (a) DESCRIBE PUR is to be used in or The mater investiga involving principle (b) DESCRIBE PROCH Material plaques. cyclotron Plaques h by U. S.	POSE FOR WHICH BYPRODUC manufactured as a "sealed source ial will be us tions of vacuu the production of operation EDURES WHICH WILL BE OBSEF Obtained from (See enc. dwgs targets HZR-2 andled using Radium Corp.	STATEMEN T MATERIAL WILL BE USED. "complete Supplement B in addi sed as a source um gauges, gas on of excited RVED TO MINIMIZE HAZARD FR U.S. Radium ( s. LAB 507 & 5 2. Plaques st rubber gloves	IT OF USE (If material is for "human un tion to this term.) the of ionization analyzers, or ionized ( toom HANDLING, STORAGE, Corp. bound ( 508) Plaques cored in lock and tweezers	e" complete Suppl tion in and oth gas mole AND DISPOSAL O to stain are sim are sim ced, ste S. Disp	ement A in lieu of this item. I experimental er instrument cules as a F THE BYPRODUCT MATERIA less steel ilar to Oak I el container. osal of scrap
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Form AEC-818

## ATOMIC ENERGY COMMISSION ) APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Page Two

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INSTRUCTIONS: C from subsequent is made in Item	Complete Items 12 applications provid 5 to the applicatio	thro ded ti n on	ugh 19 if this is a new here is no change in th which this information	v applicati le informat n appears.	on. This info ion previously	rmation submitte	may xd, an	be omi d refere	tted ence	
TRAINING	AND EXPERIENC	E ŴI	TH RADIOACTIVITY	OF INDIVI	DUAL USER N	AMED IN	ITE	M3.		
12. TYPE OF TRAINING		•	WHERE TRAINED	DURATIO	ON OF TRAINING	ON THE (Circle at	E JOB nswer)	FORMAL (Circle	COURSE answer)	
1. Principles and logical health s	practices of radio-		M.I.T.	1953	3-1957	Yes	No	Yes	No	
2. Radioactivity and ardization and niques and inst	2. Radioactivity measurement stand- ardization and monitoring tech- niques and instruments			31		Yes	No	Yes	No	
3. Mathematic basic to the us of radioactivit	3. Mathematics and calculations basic to the use and measurement of radioactivity		. 11	11		<b>T</b>	No	Ves	No	
4. Biological effect	ets of radiation		71		11	Yes	No	Ves	No	
5. Actual use of types and quat plication is bei	radioisotopes in the atities for which ap- ng made, or equiva-		N.R.C.	March-June 1957		Ves	No	· Yes	No	
lent experience										
13. ISOTOPE HANDLING ED	MAXIMUM AMOUN	г	WHERE EXPERIENCE WA	S GAINED	DURATION OF EX	PERIENCE		TYPE OF	USE	
Radium	100 µc		M.I.T.		1953-1957		Ionizing Source		g	
Co <sup>60</sup>	100 µc		11	· •					m	
Tritium	1 c		N.R.C.		<u> </u>		<u> </u>		·	
14. If Radiological Sa provide equivaler mentary sheet is	afety Officer named in at information on "T attached (Circle ansu	n Item Frainin er)	a 4 is different from indi ng and Experience With	vidual user Radioactiv	named in Item vity of Radiolog	3, use sup ical Safet	pleme y Offi	ntary sl cer." S D	ieet to Supple- No	
Spe H <sup>3</sup> sur	cial ion cha activity con veying swabs ters, and other person	ambe res	er permitting sponding to 10 Gaige DNITORING DEVICES INCLUDIN	mountin µc det <u>r Couht</u> GBIO-ASSAY PI	ng of sour cectable. <u>cer  </u> ROCEDURES	ce in May 1	side be u	e cha sed	mber for	
Film badges from New En	worn by la gland Nucle	bora ar (	atory personne Corp. in case	1. Uri of susp	bected tri	m ass Ltium	ay a spi:	ivail 11.	abie	
17. METHOD. FREQUENCY Tritium ion determinati for check w badges supp	and standards used in chamber ca ons by U.S. when response lied by Lan	n calle libi Rac e to dauc	RATING INSTRUMENTS LISTER rated by check dium Corp. Ot o standard rad er, Park Fores	ABOVE (For fi ing res her ins ium pla t, Illi	Im badges specify meth sponse of struments aque falls inois.	od of callbrath plaqu retur off.	es i ned F	processing, again to m ilm	or name ISt Jakel	
18. (a) DESCRIBE BRIEFL' Steel store	remote Handling equi	IPMENT	ith lock provi	des shi	Lelding ar	nd sto	rage	e for	•	
sources.	-	<sup>.</sup>								
		· ·	( answer)				·	Yes (	(No)	
19. DESCRIBE BRIEFLY RA	DIATION SURVEYING PRO	CEDUR	ES AND METHODS OF DISPOSIN	G OF RADIOACT	LIVE WASTES				<u> </u>	
Tritium pla our testing disposal.	ques are con ; program.	ntin Scra	nuou <mark>sly</mark> checke ap foils are r	d for a eturned	activity 1 1 to U.S.	lost a Radiu	s pa m Co	art o orp.	f for	
<u></u>	<u></u>		U. S. GOVERNMENT PRINTING OFFICE	16						
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Form AEC-818b (9-55)	APPLICATI	FOR BYPROD	UCT MATERIA	L LICENSE	)	Form approved. Budget Bureau No. 38-R028.:
If application is f the application for to manufacture a in the sealed sou omitted provided	or byproduct material or byproduct material li sealed source should co rce and/or device desig reference is made on li	to be used in or manu cense. Applicant for mplete Section II. I gn or other changes in ine below to the appl	factured as a "sea use of sealed sour f information has a information sub ication or other d	aled source" ce should com been submitt omitted previo locument on v	omplete thi plete Sectiv ed previous ously, deta which this i	is supplement and atta on I. An applicant des sly and there are no cha ils requested below ma information appears:
	************					Dir Star Tr
		SECTION I-	-USE (See instruc	tions)		
1. IF SEALED SOURCE	OR DEVICE CONTAINING SE	ALED SOURCE IS MANUFAC	TURED COMMERCIAL	LLY, GIVE FOLLO	WING INFOR	MATION:
A. Manufacture	r or supplier of sealed	source and/or device	U.S.Rá	adium Co	rp.	
B. Make and m	odel number of sealed	source and/or device	LAB 507	and LAB	508	L 2 Jan
C. Person who	will hold legal title to s	ealed source	G. Frede	erick va	indersc	
2. (a) NAME OF PERSON G. Fr	N WHO WILL PERFORM NECE ederick Vande	SSARY PERIODIC LEAKAG	E TESTS (6-month interi	vals for beta-gamme	a; 3-month peri	od for alpha emitters. See instr
(b) IF ABOVE PERSO MENT OF EXPER EVIDENCE OF IT:	N IS NOT THE SUPPLIER, M IENCE OR TRAINING OF SUC S EFFICACY AND INSTRUME	ANUFACTURER, NOR A CO CH PERSON IN TECHNIQUE NTATION TO BE USED:	MMERCIAL LABORAT	ORY ROUTINELY	OFFERING S	UCH SERVICES, GIVE BRIEF ESTING PROCEDURES INCL
The se	ources are to	be used as	ionizing	element	s in v	various exper
menta.	l measuring d	levices requ	iring the	product	ion of	excited or
ionizo	ed gas molecu	les as a pr	inciple of	e operat	ion.	Any loss of
sensi	tivity in the	ese instrume	nts is imm	nediatel	y foll	owed by a ch
OI The	e source acti	vity. Sour	ces are ch	necked b	y bein	g placed in
aemour	Such checks	tion chambe:	r; loss of	the or	der of	2% is detec
	- SUCH CHECKS	SWILL DE MAG	ne of all	plaques	at le	ast every si
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Experience with cyclotron targets has shown this method of source	E
preparation to be stable.	
2. LEAK TESTING PROCEDURE TO BE EMPLOYED INCLUDING EVIDENCE OF ITS EFFICACY AND INSTRUMENTATION TO BE USED:	
(See 2D.)	
<b>DEVICES CONTAINING SEALED SOURCE</b> (Give following information if sealed source is to be mounted in a device)	
3. ATTACH ANNOTATED ENGINEERING DRAWING OF DEVICE INCLUDING MODEL NUMBER AND DETAILS OF MOUNTING OF CONTAINER OR SOURCE H	OLDER IN
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A DESCRIBE CONSTRUCTION AND OPERATION OF THE POSITIONING MECHANISM FOR BRINGING SOURCE INTO "ON" AND "OFF" POSITIONS:	
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15. DESCRIBE CONSTRUCTION AND OPERATION OF READILY VISIBLE INDICATOR OF DEVICE INDICATING "ON" AND "OFF" POSITIONS OF SOURCE:	
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<ul> <li>15. DESCRIBE CONSTRUCTION AND OPERATION OF READILY VISIBLE INDICATOR OF DEVICE INDICATING "ON" AND "OFF" POSITIONS OF SOURCE:</li> <li>16. DESCRIBE DESIGN FEATURES WHICH SERVE TO MINIMIZE RADIATION HAZARD FROM THE DIRECT BEAM AND SECONDARY RADIATION (Including type of shielding as well as limited accessibility inherent in installations where use is contemplated)</li> <li>17. DESCRIBE LABEL TO BE AFFIXED TO DEVICE (Or attach copy. See instructions):</li> </ul>	and emount
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Form AEC-313

## Supplement to

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

20-1465-2

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(National Research Corp., Cambridge, Mass.)

## TRAINING AND EXPERIENCE WITH RADIOACTIVITY OF RADIOLOGICAL SAFETY OFFICER

12.	Type of Training	Where	When	On the Job	Formal Course
	1.	Westinghouse- Bettis Field	1949-1952	Yes	
	2.	11	27	Yes	
	3.	MIT	1947 <b>-</b> 1948	-	Yes
	4.	NRC	1956 <b>-</b> 1957	Yes <sub>.</sub>	
	5.	NRC	1956-1957	Yes	

## 13. Isotope Handling Experience

Isotope	Max. Amt.	Where	When	Type of Use
Radium	100 µc	NRC	1956-1957	Ionizing Source
Kr <sup>85</sup>	1 c	**	- 11	38 89
Tritium	1 c	**	11	11 11