DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY COMMUNICATIONS
AND ELECTRONICS MATERIEL READINESS COMMAND
FORT MONMOUTH, NEW JERSEY 07703

DRSEL-SF-H

24 APR 1978

SUBJECT: Renewal and Complete Revision of US Nuclear Regulatory Commission (NRC) Source Material License Number SUB-1150

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

1. The inclosed application for the renewal and complete revision of subject license for the use of thorium check sources in conjunction with the AN/PDR-54, AN/PDR-56F and AN/PDR-60 standard Army alpha detection instruments is submitted for review and forwarding to the NRC.

2. The inclosed application is submitted in fulfillment of the requirements of Section 40.31 of Title 10, Chapter 1, Code of Federal Regulations, Part 40.

FOR THE COMMANDER:

ROBERT H. MARCRUM
Colonel, GS
Chief of Staff

1 Incl
as

D16

FORM NRC-2
(7-77)
10 CFR 40

Approved by GA
R0203

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source materia for the activity or activities described.

1. (Check one)
- ☐ (a) New license
- ☐ (b) Amendment to License No. _____
- ☒ (c) Renewal of License No. SUB-1150
- ☐ (d) Previous License No. _____

2. NAME OF APPLICANT
See Supplement A

3. PRINCIPAL BUSINESS ADDRESS
See Supplement A

4. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED
See Supplement B

5. NAME OF PERSON TO BE CONTACTED CONCERNING THIS APPLICATION
Steven A. Horne, Health Physicist

6. TELEPHONE NO. OF INDIVIDUAL NAMED IN ITEM
201-532-3493

7. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED
As check sources used to check the operation of standard Army alpha detection instruments.

8. STATE THE TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE POSSESS, USE, OR TRANSFER UNDER THE LICENSE

(a) TYPE	(b) CHEMICAL FORM	(c) PHYSICAL FORM (*Including % U or Th.*)	(d) MAXIMUM AMOUNT AT ANY ONE TIME *(kilograms)*
NATURAL URANIUM			
URANIUM DEPLETED IN THE U-235 ISOTOPE			
THORIUM (ISOTOPE)	See Supplement C		

(e) MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME *(kilograms)*

9. DESCRIBE THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL BE USED, INDICATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING A THOROUGH EVALUATION OF THE POTENTIAL RADIATION HAZARDS ASSOCIATED WITH EACH STEP OF THOSE PROCESSES.
See Supplement D

10. LIST THE NAMES AND ATTACH A RESUME OF THE TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE OF APPLICANT'S SUPERVISORY PERSONNEL AND THE PERSON RESPONSIBLE FOR THE RADIATION SAFETY PROGRAM (OR OF APPLICANT IF AN INDIVIDUAL).
See Supplement E

11. DESCRIBE THE EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY AND RELATE THE USE OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9: INCLUDE: (a) RADIATION DETECTION AND RELATED INSTRUMENTS (including film badges, dosimeters, counters, air sampling, and other survey equipment as appropriate. The description of radiation detection instruments should include the instrument characteristics such as type of radiation detected, window thickness, and the range(s) of each instrument).
See Supplement F

(b) METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN (a) ABOVE, INCLUDING AIR SAMPLING EQUIPMENT (for film badges, specify method of calibrating and processing, or name supplier).
See Supplement G

11(c). VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST, FUMES, MISTS, OR GASES, INCLUDING PLAN VIEW SHOWING TYPE AND LOCATION OF HOOD AND FILTERS. MINIMUM VELOCITIES MAINTAINED AT HOOD OPENINGS AND PROCEDURES FOR TESTING SUCH EQUIPMENT.

Not applicable. There will be no processing or maintenance performed on these check sources requiring ventilation.

12. DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PROCEDURES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE: (a) SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCIDENTS, SUCH AS FIRE, EXPLOSION, ETC., IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS.

See Supplement H

(b) EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL.

See Supplement I

(c) DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES.

See Supplement J

13. WASTE PRODUCTS: *If none will be generated, state "None" opposite (a), below. If waste products will be generated, check here* ☐ *and explain on a supplemental sheet:*

(a) Quantity and type of radioactive waste that will be generated. None

(b) Detailed procedures for waste disposal. See Supplement K

14. IF PRODUCTS FOR DISTRIBUTION TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING:

(a) PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT.

(b) PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT.

(c) BETA AND BETA PLUS GAMMA RADIATION LEVELS (*Specify instrument used, date of calibration and calibration technique used*) AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES.

(d) METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MANUFACTURED PRODUCT.

CERTIFICATE

(This item must be completed by applicant)

15. *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 40, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

FOR THE COMMANDER:

Department of the Army
US Army Communications and Electronics Materiel Readiness Command

BY: _____ *(Signature)*

Dated 24 APR 1978

_____ *(Print or type name)*

for ROBERT H. MARCRUM
Colonel, GS
Chief of Staff

(Title of certifying official authorized to act on behalf of the applicant)

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.

NOTE

Inclosures 1, 2 and 3 are concurrences from the major field commands who are responsible for the use of the thorium check sources. Inclosures 4 and 5 are the concurrences from the CONUS Army Depots.

ATORI-OP-SW (11 Apr 78) 1st Ind
SUBJECT: Renewal and Complete Revision of US Nuclear Regulatory Commission Materials License Number SUB-1150

HQ TRADOC, Ft Monroe, VA 23651 17 APR 1978

TO: Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-SF-H, Fort Monmouth, NJ 07703

Subject license application has been reviewed. Concur as written.

FOR THE COMMANDER:

ARTHUR L. YORK
CPT, AGC
Asst AG

1 Incl
nc

AFLG-RES (11 Apr 78) 1st Ind
SUBJECT: Renewal and Complete Revision of US Nuclear Regulatory Commission Materials License Number SUB-1150

HQ, FORSCOM, Ft McPherson, GA 30330 18 APR 1978

TO: Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-SF-H, Fort Monmouth, New Jersey 07703

Concur in draft copy of subject license application for the fielding of thorium check sources.

FOR THE COMMANDER:

wd all incl

RICHARD L. GARDNER
CPT, AGC
Assistant Adjutant General

PRIORITY

PT 00393 109/2158Z PAGE 01

DRSEL :GS:HI:MM:PC:PT:CP:SS:MA:PA:IO:LG:PL:MS:LE:IG:SA:IL:SIEW:
ACTN/OPI: : : : : : : : : : : : : : : : : :
CPY FURN: X : : : : : : : : : : : : : : : :
DRDCO :GS:TCS:COM:SEI:ATC:MSCS:GARS:ATSS:SCA:
ACTN/OPI: : : : : : : : :
CPY FURN: : : : : : : : :
OTHER :DELSD:EW:ET:CS:SO:FF:RBS:PH:TT:NC:AA:MAP:CSA:
ACTN/OPI: : : : : : : : : : : : :
CPY FURN: : : : : : : : : : : : :
PTTUZYUW RUEAUSA0898 1092150-UUUU-RUEDBIA.
ZNR UUUUU
P 1919302 APR 78 ZEX
FM NGB WASHDC //NGB-ARL-M//
TO RUEDBIA/CDR CERCOM FT MOMMOUTH NJ //DRSEL-SF-H//
INFO RUKLDAR/CDR DARCOM ALEX VA //DRCSA-NG//
BT
UNCLAS
SUBJECT: APPLICATIONS AND RENEWALS FOR US NUCLEAR REGULATORY MATERIALS LICENSE
A. LETTER DRSEL-SF-H, SUBJECT: INITIAL LICENSE REQUEST, 11 APRIL 78.
B. LETTER DRSEL-SF-H, SUBJECT: RENEWAL AND COMPLETE REVISION OF US NUCLEAR REGULATORY COMMISSION MATERIALS LICENSE NO. SUB-1150, 11 APRIL 78.
C. LETTER DRSEL-SF-H, SUBJECT: RENEWAL AND COMPLETE REVISION OF US NUCLEAR REGULTORY COMMISSION SPECIAL NUCLEAR MATERIAL LICENSE NO. SNM-1327, 11 APRIL 78.
1. REF A IS A NEW LICENSE REQUEST ORIGINALLY LICENSED UNDER 29-01022-8 AMENDMENT 1 FOR THE FIELDING OF THE AN/PDR-39( ) RADIAC SET. REF B IS A COMPLETE REVISION OF NRC LICENSE NO. SUB-1150 FOR THE FIELDING OF THORIUM CHECK SOURCES FOR THE AN/PDR 54, AN/PDR-56F AND AN/PDR-60 RADIAC SETS. REF C IS A COMPLETE REVISION OF NRC LICENSE

PAGE 2 RUEAUSA0898 UNCLAS
NO. SNM-1327.
2. THE ABOVE REFERENCED REQUESTS FOR NCR LICENSES HAVE BEEN REVIEWED AND THIS MESSAGE SIGNIFIES CONCURRENCE.
BT
#0898

NNNN

DEPARTMENT OF THE ARMY
HEADQUARTERS, LEXINGTON-BLUE GRASS ARMY DEPOT
LEXINGTON, KENTUCKY 40507

SDSRR-LQCP

12 April 1978

SUBJECT: Source Material License SUB-1150 for Check Source CS-12

Commander
USA Communication & Electronic Material Readiness Command
ATTN: DRSEL-SF-H
Fort Monmouth, New Jersey 07703

1. This refers to your application for renewal and revision of Source Material License SUB-1150.

2. We have reviewed the responsibilities of this activity as outlined in the application for renewal and revision of SUB-1150 and we concur.

Douglas L Hanna
for PHILIP G. JACKSON
C, Quality Assurance Division

ROUTINE

PT 08039 109/0123Z PAGE 01

DRSEL :GS:HI:MM:PC:PT:CP:SS:MA:PA:IO:LG:PL:MS:LE:IG:SA:IL:SIE:
ACTN/OPI: : : : : : : : : : : : : : : : : : :
CPY FURN: : : : : : : : : : : : : : : : : : :
DRCO :GS:TCS:COM:SEI:ATC:MSCS:GARS:ATSS:SCA:
ACTN/OPI: : : : : : : : : :
CPY FURN: : : : : : : : : :
OTHER :OELSD:EW:ET:CS:SO:FF:RBS:PH:TT:NC:AA:MAP:CSA:
ACTN/OPI: : : : : : : : : : : : : :
CPY FURN: : : : : : : : : : : : : :
RTTUZYUW RUWMFWA5514 1090045-UUUU--RUEDBIA.
ZNR UUUUU
R 182230Z APR 78
FM CDR SAAD SACRAMENTO CA //SDSSA-GMD-1//
TO CDR CERCOM FT MONMOUTH NJ //DRSEL-SF-H//
BT
UNCLAS
SUBJECT: CERCOM NRC LICENSE REQUEST
A. YOUR LETTER DRSEL-SF-H SUBJ RENEWAL AND COMPLETE REVISION OF US NUCLEAR REGULATORY COMMISSION SPECIAL NUC MATERIAL LICENSE NUMBER SNM-1327, DTD 10 APR 78 (U)
B. YOUR LETTER DRSEL-SF-H SUBJ INITIAL LICENSE REQUEST DTD 11 APR 78 (U)
C. YOUR LETTER DRSEL-SF-H SUBJ RENEWAL & COMPLETE REVISION OF US NUC REGULATORY COM MATERIALS LICENSE # SUB-1150, DTD 12 APR 78 (U)
THE REFERENCED LICENSE APPLICATIONS WERE REVIEWED BY THE RPO OF THIS DEPOT AND MATTERS PERTAINING TO SACRAMENTO ARMY DEPOT ARE CONCURRED.
BT
#5514

NNNN

ROUTINE

SUPPLEMENT A

1. Reference: Items 2 and 3 of Form NRC-2.

2. Department of the Army
US Army Communications and Electronics
Materiel Readiness Command
ATTN: DRSEL-SF
Fort Monmouth, New Jersey 07703

SUPPLEMENT B

1. Reference: Item 4 of Form NRC-2.

2. Lexington-Blue Grass Army Depot Activity (LBAD), Lexington, Kentucky, Sacramento Army Depot (SAAD), Sacramento, California and Department of Defense installations and activities worldwide possessed under the control of Department of the Army military and/or civilian personnel.

SUPPLEMENT C

1. Reference: Item 8 of Form NRC-2.

2. Source A: This source is the Eberline Instrument Corporation (EIC) Model CS-12 check source containing metallic (99.99 percent) ^{230}Thorium in the form of an electroplated disk. The maximum amount of ^{230}Thorium possessed at any one time in this form will be one (1) milligram.

3. Source B: This source is the Nuclear Research Corporation Part Number B-1093 check source containing metallic (99.99 percent) ^{232}Thorium in the form of an extruded metal sheet. The maximum amount of ^{232}Thorium possessed at any one time in this form will be 2.15 kilograms.

4. The maximum total quantity of source material possessed at any one time will not exceed 2.15 kilograms.

SUPPLEMENT D

1. Reference: Item 9 of Form NRC-2.

2. Source A: The Eberline Instrument Corporation Model CS-12 check source, each containing less than 20 nanocuries of ^{230}Thorium, is electroplated on an 0.875 inch diameter steel disk which, in turn, is epoxyed into a 2 inch diameter plastic disk. The CS-12 check source is used to check the functional operation of the AN/PDR-54, AN/PDR-60, or equivalent, standard Army alpha detection instruments by placing the active area of the source directly over the probe face of the instrument.

3. Source B: The Nuclear Research Corporation Part No. B-1093 check source, each containing less than 235 nanocuries of metallic ^{232}Thorium, is rolled and extruded into sheet form. This source is 2.25 inch by 0.515 inch by 0.010 inch in dimension, weighs approximately 2.15 grams, and is used to check the functional operation of the AN/PDR-56F standard Army alpha detection instrument. The check source is bonded to the underside of the AN/PDR-56F standard Army detection instrument and is used to check the functional operation of this instrument by placing the active area of the instrument probe face directly over the check source.

4. The potential radiation hazards associated with these sources are negligible, if any. The hazards associated with Thorium are the ingestion into the body and retention in the critical organ, i.e., bone. Assuming the worst possible case, if an individual were to premeditatedly ingest the entire Nuclear Research Corporation Thorium check source, which is approximately 235 nanocuries, using ICRP data, the maximum activity deposited to the bone is approximately 17 picocuries and the maximum activity to the whole body of 24 picocuries is obtained. This compares to the maximum permissible body burden for ^{232}Thorium of 40 nanocuries to the whole body based on the bone being exposed as the critical organ. This occurrence, of course, is highly unlikely.

SUPPLEMENT E

1. Reference: Item 10 of Form NRC-2.

2. Inclosures 1, 2 and 3 are the qualifications of the Radiation Protection Officer, the Alternate Radiation Protection Officer and the License Manager.

STEVEN A. HORNE, Health Physicist, US Army Communications and Electronics Materiel Readiness Command (CERCOM), Fort Monmouth, New Jersey

1. Educational Background:

Old Dominion University Norfolk, Virginia	3 Years	1964 - Associated in Applied Science
The Catholic University of America Washington, DC	2 Years	1975 - BSE Nuclear Science and Engineering
The Catholic University of America Washington, DC	-	1975 - Graduate Work in Nuclear Science and Engineering

2. Formal Training and Experience in Radiation Protection Methods, Measurements and Effects:

	Duration of Training	On The Job	Formal Course
a. Fifty-six semester hours pertaining to radiation, including college physics, Environmental Aspects of Nuclear Power Plant Management, Environmental Radioactivity, Nucleonic Fundamentals, Nuclear Properties and Interactions, Nuclear Physics, Nuclear Radiation Detection, Nuclear Reactor Physics, Radiation Biology, Radioisotope Techniques and Radiological Physics - Old Dominion University and The Catholic University of America.	1961-1975	No	Yes
b. Radiation Detection Effects and Devices Utilizing various type of high energy accelerators - Virginia Associated Research Center Newport News, Virginia, and NASA Langley Research Center, Langley, Virginia.	1 Year	Yes	No
c. Radiation safety, detection instrumentation and isotopic handling equipment - Flow Corp, Fort Belvoir, Virginia.	2 Months	Yes	No

Incl 1

	Duration of Training	On The Job	Formal Course
d. Radiological Safety Course pertaining to Nuclear Moisture/ Density Instrumentation - Seaman Nuclear Corporation, Milwaukee, Wisconsin.	24 Hours	No	Yes
e. Occupational Radiation Protection Course 212 - Public Health Services, Las Vegas, Nevada	80 Hours	No	Yes
f. Fundamentals of Non-Ionizing Radiation Protection Course 264 - Public Health Service, Rockville, Maryland.	40 Hours	No	Yes
g. Laser Safety Course - University of Cincinnati, Ohio	40 Hours	No	Yes
h. Radionuclide Analysis by Gamma Spectrocopy Course 208 - Public Health Service, Winchester, Massachusetts.	80 Hours	No	Yes
i. Radiation Guides and Dose Assessment Course 272 - Environmental Protection Agency, Las Vegas, Nevada.	80 Hours	No	Yes

3. Experience with Radioisotopes:

Isotope	Maximum Activities in Curies	Duration of Experience	Type of Experience
^{241}Am	1	3 Years	For all radionuclides listed, experience consisted of laboratory analysis, wipe tests, experiments and evaluations utilizing these sources.
^{252}Cf	.27	3 Years	
^{57}Co	0.1	4 Years	
^{60}Co	1200	8 Years	
^{137}Cs	1	8 Years	
^{3}H	20	8 Years	
^{192}Ir	100	8 Years	
^{147}Pm	1	8 Years	
$^{226}RaBe$	1	5 Years	
$^{239}PuBe$	1	1 Year	
^{90}Sr	0.1	2 Years	

4. Experience with other Radiation Producing Machines:

Radiation Machine	Duration of Experience	Type of Experience
a. NASA Langley Research Center, and Virginia Associated Research Center's, Space Radiation Effects Laboratory consisting of a 2 MeV Van de Graaff accelerator, 3 MeV Dynamitron accelerator, 10 MeV Linear Electron Accelerator, a 600 MeV Proton Synchrocyrlotron Accelerator and a 14 MeV Neutron Generator.	1.5 Year	Radiation damage Shielding Experiments and Related Health Physics Studies.
b. 250 KeV General Electric Corporation X-ray machine	8 Years	Health Physics and laboratory experiments.
c. Various energy dispersive and wave length X-ray fluorence spectrometry with X-ray generators up to 50 KeV.	8 Years	Health Physics and laboratory experiments.

5. Experience with radiation:

1964-1965 - Virginia Associated Research Center, NASA, Langley Research Center, Virginia as health physics technologist.

1965-1966 - E.R. Squibb, New Brunswick, New Jersey as radiochemist isotope technologist

1966-1968 - Flow Corporation, Nuclear Division, Fort Belvoir, Virginia as radiation engineer.

1968-1976 - US Army Mobility Equipment Research and Development Command, Fort Belvoir, Virginia as health physicist.

1976-1978 - US Army Electronics Command, Fort Monmouth, New Jersey as health physicist.

1978 to present- CERCOM, Fort Monmouth, New Jersey as health physicist.

BARRY J. SILBER, Health Physicist, US Army Communications and Electronics Materiel Readiness Command (CERCOM), Fort Monmouth, New Jersey.

a. Education:

(1) A.A. - Brooklyn College of the City University of New York, Brooklyn, New York - 1965.

(2) B.S. - Brooklyn College of the City University of New York, Brooklyn, New York - 1969. Major: Chemistry.

b. Professional Experience:

(1) October 1966 - May 1967:
Allen Pharmacal Corporation, 175 Pearl Street, Brooklyn, New York.
Laboratory Technician - Analytical Chemistry Laboratory.
Laboratory analyses of pharmaceuticals at various stages of manufacture to insure compliance with Food and Drug Administration Regulations as well as United States Pharmacopeia and National Formulary Monographs.

(2) June 1967 - March 1970:
EON Corporation, 175 Pearl Street, Brooklyn, New York.
Chemist - Responsible for all health physics activities, including radiation surveys, air sampling and wipe tests, leak testing of sealed sources, decontamination of facilities and equipment, disposal of radioactive wastes, calibration of radiation survey and measurement instrumentation, record-keeping, etc., to insure compliance with US Nuclear Regulatory Commission (NRC) and New York State Regulations; liaison between regulatory agencies and corporate management; authorized radiation worker (user) of multiple types of radioactive materials used in the manufacture of radiation sources for commercial, military and highly specialized (custom-made) use; responsible for all chemistry activities including metallurgical applications on products at various stages of manufacture to meet quality control specifications.

(3) March 1970 - June 1977:
State of New York Department of Labor, Division of Safety and Health, 2 World Trade Center, New York, New York.
Senior Radiophysicist - Radiological Health Unit.
Responsible for the review of applications, including the evaluation of facilities, equipment, personnel and products containing radioactive materials, and in the preparation of State licenses authorizing the possession and use of radioactive materials by persons in industry and related activities in this State; assist in the administration of the licensing program; consult with and assist industrial management personnel and others in establishing radiation protection programs; conduct inspections, special prelicensing investigations, radiation surveys and tests at the sites of licensees and registrants using radiation sources to enforce state regulations and to insure that radiation workers and the general public are fully protected; assemble environmental research data, analyze and interpret this data, assist in the publication of scientific reports, and training of new staff members.

(4) June 1977 - January 1978:
US Army Electronics Command (ECOM), Fort Monmouth, New Jersey.
Health Physicist - Responsible for health physics functions in the establishment and implementation of the ECOM Safety Program aimed at establishing life cycle controls of ECOM commodities utilizing radioactive material and ionizing radiation producing devices; responsible for the evaluation of radiological protection programs and radiation facilities to determine their adequacy and to insure compliance with DA Authorizations and NRC Licenses; perform studies and evaluations necessary to minimize the health risks to personnel; prepare and review applications for DA Authorizations and NRC Licenses; establish and maintain radiation protection records and files.

(5) January 1978 - Present:
CERCOM, Fort Monmouth, New Jersey.
Duties are the same as in Item b(4) above. Name change from ECOM to CERCOM.

c. Formal Training in Radiation Protection Methods, Measurements and Effects:

	Duration of Training	On-The-Job	Formal Course
(1) X-Ray Technology for Radiological Health Personnel-Memorial Hospital for Cancer and Allied Diseases, 444 East 68th Street, New York, New York - 11 January - 14 January 1971.	3 Days	No	Yes
(2) Orientation Course in Regulatory Practices and Procedures - NRC, Bethesda, Maryland - 1 March - 19 March 1971.	3 Weeks	No	Yes
(3) Health Physics and Radiation Protection - Special Training Division, Oak Ridge Associated Universities, Oak Ridge, Tennessee - 12 February 1973 to 20 April 1973. Sponsored by the NRC for Agreement State regulatory personnel.	10 Weeks	No	Yes
(4) Radiological Safety Course - US Army Ordnance and Chemical Center and School, Aberdeen Proving Ground, Maryland - 25 October - 15 November 1977.	3 Weeks	No	Yes

c. Experience with Radiation.

Isotope	Maximum Amount	Duration of Experience	Type of Use
(1) ^{14}C	60 mCi	3 years	For items 1 through 10- manufacture of sealed sources, health physics surveys and wipe tests.
(2) ^{32}P	10 mCi	3 years	
(3) ^{36}Cl	10 mCi	3 years	

Isotope		Maximum Amount	Duration of Experience	Type of Use
(4)	^{63}Ni	10 mCi	3 years	
(5)	$^{90}Sr/^{90}Y$	50 mCi	3 years	For items 11 and 14- calibration of radiation instrumentation, health physics surveys and wipe tests.
(6)	^{99}Tc	100 mCi	3 years	
(7)	$^{106}Ru/^{106}Rh$	50 mCi	3 years	
(8)	$^{144}Ce/^{144}Pr$	500 mCi	3 years	
(9)	^{147}Pm	500 mCi	3 years	For items 12 and 13-health physics surveys and wipe tests.
(10)	^{204}Tl	50 mCi	3 years	
(11)	^{60}Co	10 mCi	3 years	
(12)	^{60}Co	200 Ci	3 years	
(13)	^{137}Cs	250 Ci	3 years	
(14)	^{226}Ra	20 mCi	3 years	

BERNARD M. SAVAIKO, Chief, Safety Office, US Army Communications and Electronics Materiel Readiness Command (CERCOM), Fort Monmouth, New Jersey.

a. Education: 1957 - B.S. Industrial Engineering, Columbia University, New York, New York.

b. Professional Experience:

(1) 5 years - Safety Officer - US Air Force.

(2) 4 years - Industrial Safety - U.S. Steel Corporation.

(3) 16 years- Industrial Safety and Chief, Safety Office - USACERCOM (formerly US Army Electronics Command) Fort Monmouth, New Jersey, including 3 years experience as a Radiation Protection Officer w ith responsibilities for the control of various commodities containing radioactive materials.

Mr. Savaiko is designated as the manager of this Nuclear Regulatory Commission License.

SUPPLEMENT F

1. Reference: Item 11(a) of Form NRC-2.

2. Due to the negligible radiological hazard potential of these check sources, radiation detection instrumentation is not required. However, activities authorized these check sources are issued the AN/PDR-54, AN/PDR-56F and AN/PDR-60 standard Army alpha detection instruments.

3. The list of available radiation detection/measurement instrumentation at LBAD and SAAD are contained in the supporting documentation to their NRC Byproduct Material License Numbers 16-05033-01 (LBAD) and 04-04279-01(SAAD).

SUPPLEMENT G

1. Reference: Item 11(b) of Form NRC-2.

2. The AN/PDR-54 and AN/PDR-60 standard Army alpha detection instruments for field use and for health and safety purposes are calibrated with the AN/UDM-6 and AN/UDM-7b Radiac Calibrator Sets in accordance with the frequency specified in Technical Bulletin (TB) 43-180, Calibration Requirements for the Maintenance of Army Materiel, and procedures prescribed in the technical manuals issued with the instruments. Presently the calibration frequency specified is once every 90 days for health and safety purposes and once every 240 days for field use. The AN/UDM-6 and AN/UDM-7b Radiac Calibrator Sets utilize ^{239}Plutonium and are traceable to the National Bureau of Standards. The AN/UDM-6 and AN/UDM-7b Radiac Calibrator Sets are presently possessed under NRC Special Nuclear Material License Number SNM-1745 issued to the Department of the Army, US Army Armament Materiel Readiness Command, Rock Island, Illinois.

3. The AN/PDR-56F standard Army alpha detection instrument for field use and health and safety purposes is calibrated with the AN/UDM-7b Radiac Calibrator Set in accordance with the frequency specified in TB 43-180 and procedures prescribed in the technical manual issued with the instrument. Presently the calibration frequency specified for field use is once every 120 days. The calibration frequency for health and safety purposes is as specified in paragraph 2 above.

SUPPLEMENT H

1. Reference: Item 12(a) of Form NRC-2.

2. Appropriate radiological safety instructions for the safe use and handling of the thorium check sources are provided the users of the AN/PDR-54, AN/PDR-56F and AN/PDR-60 standard Army alpha detection instruments in their respective technical manuals.

3. Technical Manual (TM) 11-6665-221-15, Operator, Organizational, Direct Support, General Support and Depot Maintenance Manual Including Repair Parts Lists For Radiac Set AN/PDR-60 (Eberline Instrument Corporation Portable Alpha Counter Model PAC-1SAGA), contains the following radiological safety notice for the check sources and is located on the inside of the front cover:

> Check Source CS-1 contains 0.01 microcuries of Plutonium (Pu 239) and Check Source CS-12 contains 0.01 microcuries of Thorium (Th 230). Do not allow any of this material to come in contact with the skin. Damage to body tissue can occur if the material enters the body through cuts in the skin or by accidental swallowing.

4. The AN/PDR-56F standard Army alpha detection instrument is in the process of being procured and the technical manual presently does not exist. The following proposed caution statement, or equivalent, will appear in the manual.

> CAUTION
>
> The Thorium Check Source, which is located on the underside of the radiacmeter case, should always be handled with extreme care. The source is of metallic form and is not subject to wiping off or flaking, however, IT SHOULD NEVER BE TOUCHED WITH A SHARP OBJECT WHICH COULD SCRATCHED OR ABRADE IT.

5. TM 11-6665-208-15, Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual, Radiac Set AN/PDR-54, is in the process of being revised to substitute the CS-12 check source for the M-8 check source formerly used in conjunction with this radiac set. The following proposed caution statement, or equivalent, will appear in the manual.

> Check Source CS-12 contains 0.01 microcuries of Thorium 230. Do not allow any of this material to come in contact with the skin. Damage to body tissue can occur if the material enters the body through cuts in the skin or by accidental swallowing.

SUPPLEMENT I

1. Reference: Item 12(b) of Form NRC-2.

2. Instructions in the AN/PDR-54 and AN/PDR-60 Radiac Set technical manuals require monthly preventive maintenance checks for the radioactive check source when the instruments are in a usable configuration and further require disposition as radioactive waste if they are dented, chipped, scratched, deformed or flaking. In addition, these instructions require that check sources not be used if they are damaged. The following disposition instructions, or equivalent, appear in the technical manuals:

a. Do not use the check source if it is damaged or deformed.

(1) Deformation of the check source will cause some flaking of the radioactive material. Such flaking will reduce the radioactivity of the check source and make it useless for calibration purposes. Also, this flaking will increase the possibility of the user picking up particles of radioactive material that may be transferred to the mouth when smoking or eating.

(2) Fire can damage the check source. The different rates of expansion of the radioactive material and the check source plate may cause flaking when the check source is exposed to high temperature.

b. Dispose of damaged check source in accordance with AR 755-15.

3. Similar preventive maintenance instructions will be provided for the check source used with the AN/PDR-56F Radiac Set. Disposition instructions for damaged check sources will be provided the users of this radiac set.

SUPPLEMENT J

1. Reference: Item 12(c) of Form NRC-2.

2. The Army program for control of radioactive items of supply is prescribed specifically in two regulations. AR 700-64, Radioactive Commodities in the DOD Supply System, is an interservice regulation which prescribes responsibilities for control of radioactive items and components which are introduced in the supply system. AR 700-52, Licensing and Control of Sources of Ionizing Radiation, establishes requirements for obtaining NRC Licenses for radioactive materials and authorizations to possess radioactive material not controlled by NRC. Major Army commands are implementing these Department of the Army (DA) regulations.

3. The authority contained in the NRC license issued to CERCOM permits Army installations and activities to acquire and use of the thorium check sources without obtaining their own license. This is based upon commitments made by CERCOM that all Army elements will comply with conditions contained in this license and with pertinent Army regulations. The NRC requires control of all operations involving radioactive items to insure the safety of personnel and property. Army activities possessing licensed radioactive sources and the agencies controlling them are subject to inspection by the NRC in addition to inspection by Army elements.

4. The mission of CERCOM includes the management and performance of all materiel life cycle functions and services and acts as DA licensee for Army-wide distribution of these items. The following is a description of functions of the various CERCOM elements providing a coordinated effort:

a. The functions for the manager of the NRC License are assigned to the Chief, Safety Office of the Command Staff of this headquarters. The responsibilities of the manager are to:

(1) Coordinate, obtain, administer, review, amend and maintain necessary licenses for radioactive commodities managed by this command.

(2) Provide information and guidance to all commanders, with respect to limitations, constraints, conditions or procedures which affect the responsibilities of those commanders for the radioactive commodity.

(3) Monitor the various elements of the life cycle program of the radioactive commodities to assure compliance with conditions of the applicable license.

(4) Assure that licensed material is not transferred to unauthorized persons or organizations.

b. The health physicists serve as the CERCOM staff contact for radiological control and licensing matters to the Army Materiel Development and Readiness Command, other major commands and Department of the Army elements,

other services and federal agencies; provide advice and assistance to other CERCOM elements involved in the fielding of radioactive items, the National Inventory Control Point (NICP) (an element of CERCOM), depots and other Army elements; prepare applications for NRC Licenses for Army-wide distribution of assigned items; prepare radiological safety instructions for incorporation in technical literature and other published guidance pertaining to the items; coordinate with the NICP to assure that requisitioning elements are authorized to and technically capable of receiving the item and that procurements do not exceed the quantity or use limitations imposed by the various licenses; perform pre-award and post award health physics surveys of contractors; provide health physics advice to be included in instructions for disposal of radioactive waste, and serve as staff officers for notification, investigation, and preparation of reports required in the event of an accident or incident in which this command's radioactive items may be involved.

c. The CERCOM NICP located at Fort Monmouth, New Jersey has adopted special procedures for individually controlled radioactive items that are in addition to standard Army Supply practices used for all type classified items. The control point maintains records of procurements, receipts, storage locations, shipments, using locations, authorizes, issues, and assures adequate supply. It reviews requisitions submitted and when approved, issues material release orders to the designated depot for shipment of the material to the requisitioner. Requisitions are submitted through various command control channels. The control point bases its approval on previously established authorization of the requisitioner to receive the item from the supply standpoint such as an approved Table of Allowances. Upon approval of the requisition, the control point issues a material release order to the depot storing the item. The depot ships the item directly to the requisitioner, notifies the control point and furnishes other shipping data which is forwarded also through supply property office channels.

d. Reports of excess items are submitted through various command channels to the NICP for review for serviceability, turn-in or disposal as radioactive waste. Requests for disposition instructions of radioactive waste are submitted through radiological command channels to the NICP.

e. The major Army commands have established regulatory requirements for control of the radioactive items. Each major command has established at the headquarters level a radioactive material control point and appointed a command radiological control officer to administer control of radioactive items within the command. That officer reviews and concurs in the qualifications of local radiation protection officers within the command, maintains records of radioactive items by location and assures periodic inventory and leak tests by using activities, performs periodic inspections/audits of accountable installations/activities to assure that items are properly handled in accordance with Army and NRC regulations, and to assure the submission of inventory and leak test reports and accident/incident reports. The local radiation protection officer is responsible for administering the local radiation protection program. Local programs provide for designated controlled areas, dosimetry, instrumentation, operating procedures to supplement published manuals for the items, receipts, transfers, storage

and records. Requisitions originated by using elements are processed through the local radiation protection officer to the major command radiation control officer. The requisition is reviewed from the radiation protection standpoint and logistics authority for possession. If approved, the requisition is forwarded to the NICP. Upon receipt of notification from the NICP of the transaction the information is forwarded to the local radiation protection officer who assumes radiation protection responsibility for the item. Requests for transfers of items between installations/activities are reviewed by the command radiological control officer and if approved reported to the NICP. Transfers outside the major commands are reviewed and approved by the NICP. Reports of excess items are submitted through radiological control channels for review for serviceability, turn-in or disposal as radioactive waste. Requests for disposition instructions of radioactive waste are submitted through radiological command channels to Commander, USACERCOM, ATTN: DRSEL-SF-H, Fort Monmouth, New Jersey 07703.

f. LBAD and SAAD will provide bulk storage, quality surveillance and issue of the thorium check sources when approved by the NICP. Where radioactive materials are involved, both LBAD and SAAD have established special warehousing facilities, handling procedures and have established formal radiation protection programs administered by qualified physicists (RPO). Messrs Joseph M. King and Frederick T. Toyama, respectively, have been designated to serve in this capacity for LBAD and SAAD, respectively. Radioactive items are inspected when received, at intervals during storage and immediately before shipment. The inspections are conducted according to established surveillance procedures as determined by CERCOM for each item. The quality surveillance program for the thorium check sources will be performed by either the depot RPO, his alternates or the CERCOM health physicists and will involve the annual leak testing of a random sampling of at least one percent of depot assets and/or a minimum of five each of the thorium check sources, whichever is greater. The depots will provide the results to Commander, USACERCOM, ATTN: DRSEL-SF-H, Fort Monmouth, New Jersey 07703. LBAD and SAAD will provide the NICP with notification of individually controlled item receipts, inspections and shipments. The qualifications of the LBAD and SAAD RPOs, their alternates and radiation protection programs are described in the supporting documentation to their NRC Byproduct Material License Numbers 16-05033-01 (LBAD) and 04-04279-01 (SAAD).

g. The program for control of the thorium check sources, as with other radioactive items is, to the extent practical, the same logistics procedures applied to other Army supplies. Regulatory guidance has been established by DA and implemented by the various commands, governing the management process, life-cycle management of material, logistics management and support, procurement, maintenance, storage, transportation, including packaging and disposal. For radioactive items the procedures are augmented by specific regulatory controls pertaining to the possession and use of radioactive materials, control of personnel radiation exposure, safe storage, handling, maintenance, transportation and disposal of the items. For the thorium check sources, more stringent controls have been established as distribution of these devices are limited to authorized

activities. These controls include identifying and insuring that these check sources are coded in the Commodity Command Standard System Automated Data Processing Program as radioactive in accordance with Appendix A of AR 708-1, Cataloging and Supply Management Data. This calibrator set is coded with a Special Control Item Code of 8 meaning Radioactive Item. Requisitions are processed initially by computers and then are manually processed by the NICP item manager to verify that the requisitioners are authorized to receive these check sources. To insure that the above requirements are being implemented, the CERCOM Health Physicists maintain close coordination with the item manager.

h. Users of the thorium check sources do not require specific radiation protection training other than their familiarization with the technical manuals for, and provided with, radiac instruments utilizing these sources. However, individuals using these instruments are ordinarily, as a minimum, members of a unit Nuclear, Biological, Chemical (NBC) team. Membership in a unit NBC team carries a requirement of 16 hours of NBC training, including the use of the radiac instrument as well as some training in radiation protection and radioactivity measurement. The use of these instruments is supervised by the unit NBC officer or NBC noncommissioned officer having at least 80 hours of NBC training, including training in radiation protection and radioactivity measurement.

i. Users of the thorium check sources are provided with specific instructions on the safe handling, use, storage and disposal of these sources in the technical manuals for, and provided with, radiac instrumentation utilizing these sources, specifically, the AN/PDR-54, AN/PDR-56F and AN/PDR-60, or equivalent. This information satisfies the radiation protection instructions to users as required by Title 10, Chapter 1, Code of Federal Regulations, Parts 19 and 20. Commander, USACERCOM, ATTN: DRSEL-SF-H, Fort Monmouth, New Jersey 07703 will make available to the users the appropriate NRC regulations, the NRC license, license conditions, documents incorporated into the license by reference, and amendments thereto, and any notice of violation involving radiological working conditions for examination. The following statement, or equivalent, will also be provided to the users along with Form NRC-3, Notice to Employees:

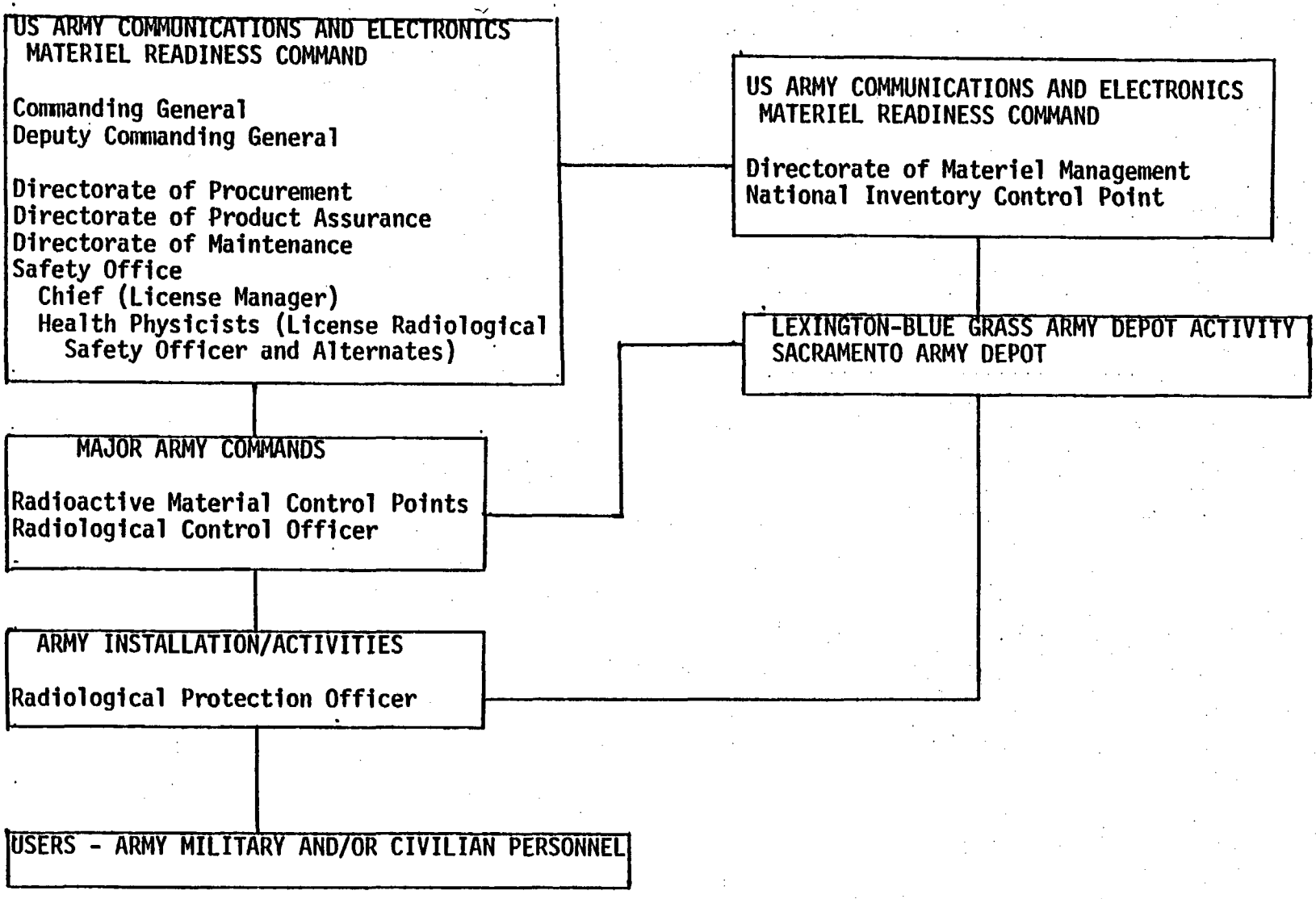
> Users of the thorium check sources used to check the functional operation of the AN/PDR-54, AN/PDR-56F and AN/PDR-60 Radiac Sets are provided with specific instructions on the safe handling, use, storage and disposal of radioactive material as described in the technical manuals for, and provided with, these radiac sets. This information satisfies the radiation protection instructions to users as required by Title 10, Chapter 1, Code of Federal Regulations, Parts 19 and 20. Form NRC-3, Notice to Employees, is also being provided with this letter and users are required to post this notice as required by the regulations. In addition, users may request further information relating to the NRC license, license conditions, documents incorporated into the license by reference, and amendments

thereto, from Commander, USACERCOM, ATTN: DRSEL-SF-H, Fort Monmouth, New Jersey 07703. The Command Safety Office may be contacted by telephone on AUTOVON 992-3493 for this purpose.

NOTE

Inclosed is an abbreviated organizational chart as required by paragraph 3-2.g.(3) of AR 700-64, Radioactive Commodities in the DOD Supply Systems.

RADIOLOGICAL SAFETY CONTROLS - FUNCTIONAL CHART*



* This chart does not delineate a chain-of-command organizational structure. It does represent technical safety and control measures to be used for test samples.

SUPPLEMENT K

1. Reference: Item 13 of Form NRC-2.

2. There will be no processing of these sources causing the generation of radioactive waste. However, should these sources become damaged during use, they will be disposed of as radioactive waste in accordance with AR 755-15, Disposal of Unwanted Radioactive Material.