NRC FORM 374
(7-94)

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Amendment No. 19

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 I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 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). 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.

OFFICIAL RECORD COPY

Licensee	
1. Department of the Army	In accordance with the letter dated July 9, 1996,
2. United States Military Academy West Point, New York 10996	3. License Number 31-02102-02 is amended in its entirety to read as follows:
	4. Expiration Date July 31, 2001
	5. Docket or Reference No. 030-00897

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 with Atomic Numbers 1 through 91	A. Sealed sources	A. Not to exceed 10 millicuries per source and 200 millicuries total
B. Nickel 63	B. Plated sources in Hewlett Packard Model 18713A detector cells	B. Not to exceed 15 millicuries per detector cell and 45 millicuries total
C. Cesium 137	C. Sealed sources	C. 50 millicuries
D. Plutonium 239	D. Sealed neutron sources (Monsanto)	D. 80 grams
E. Americium 241	E. Sealed source (Amersham-Searle Model AMC 2084)	E. 10 millicuries
F. Americium 241	F. Sealed source (Kevex Ray Model 0122)	F. 50 millicuries
G. Americium 241	G. Sealed source (Isotope Products Model AN-241-25)	G. 25 millicuries
H. Cadmium 109	H. Sealed source (Isotope Products Model AN-109-25)	H. 25 millicuries
I. Iron 55	I. Sealed source (Isotope Products Model AN-55-25)	I. 25 millicuries

9. Authorized use

A. Teaching and training of students.
B. For use in gas chromatographs; teaching and training of students.
C. through I. Teaching and training of students.

CONDITIONS

10. Licensed material may be used only at the licensee's facilities at the U.S. Military Academy, Department of Physics, Bartlett Hall, West Point, New York.

ML 10

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number: 31-02102-02

Docket or Reference Number: 030-00897

Amendment No. 19

11. A. Licensed material shall be used by, or under the supervision of, LTC David J. Frenier, M.S., CPT Alan M. Daus, M.S., LTC Brian E. Moretti, Ph.D., or LTC Thomas J. Rosener, Ph.D.

B. The Radiation Safety Officer for this license is CPT Alan M. Daus, M.S.

12. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.

13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed 3 years.

B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.

C. 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 or detector cell received from another person shall not be put into use until tested.

D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

E. Sealed sources and detector cells need not be leak tested if:

(i) they contain only hydrogen 3; or

(ii) they contain only a gas; or

(iii) the half-life of the isotope is 30 days or less; or

(iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or

(v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source involved, the test results, and corrective action taken.

G. The licensee is authorized to collect leak test samples for analysis by the licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.

14. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders or detector cells by the licensee.

15. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 5 years from the date of each inventory.

16. The licensee may transport licensed material in accordance with the provisions of 10 CFR 71, "Packaging and Transportation of Radioactive Material."

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number: 31-02102-02
Docket or Reference Number: 030-00897
Amendment No. 19

17. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Application dated April 3, 1984
B. Letter dated May 30, 1985
C. Letter dated August 16, 1988
D. Letter dated June 27, 1989
E. Letter dated November 16, 1989
F. Application dated August 24, 1990
G. Letter dated April 9, 1993
H. Application dated August 29, 1994
I. Letter dated July 9, 1996
J. Application dated August 15, 1996
K. Facsimile received December 13, 1996

Date FEB 26 1997

For the U.S. Nuclear Regulatory Commission
Original Signed By
James M. Bonjick
By _____
Nuclear Materials Safety Branch
Region I
King of Prussia, Pennsylvania 19406

FEB 26 1997

License No. 31-02102-02
Docket No. 030-00897
Control No. 123588

Commander
U.S. Army Materiel Command
AMCSF-P
5001 Eisenhower Avenue
Alexandria, VA 22333

Dear Commander:

This is in reference to your license amendment request. Enclosed with this letter is the amended license. Please note that a part of this amendment, in accordance with 10 CFR 30.36, effective February 15, 1996, the expiration date of your license has been extended by a period of five years. Your new expiration date is stated in Item 4 of the license.

Your request to add an additional Nickel-63 (2.6 millicuries) source to be used in a Field Ion Spectrometer is authorized under Item 6.A., Item 7.A., and Item 8.A. in the license. Note that this specific source/device has not been evaluated under the source and device registry program, and as such, should be used with additional precaution. In addition, before purchasing this source/device, you should conduct an accurate inventory of current byproduct material with Atomic Numbers 1 through 91 to ensure that the maximum possession limits do not exceed 10 millicuries per source and 200 millicuries total, in accordance with item 8.A. of the license.

In your amendment request, you also stated that the purpose of the amendment was to identify current users and designate a new Radiation Safety Officer. However, you also provided the application dated August 15, 1996, which included Annex A through Annex I. These annexes appear to include new and/or revised procedures that supplement or replace information submitted in the past. Therefore, the annexes were reviewed and are now part of your license. The following issues were identified which require clarification of statements in your procedures for completeness or accuracy, however, they do not require that you amend your license:

1. Annex F, Appendix 2, Item 2.(b), page 26, in your application refers only to posting requirement in 10 CFR 19 and 21. There are also posting requirements in 10 CFR Part 20, Subpart J.

2. Annex F, Appendix 6 in your application appears to require contamination surveys (wipe tests) only of packages that exceed Type A quantity limits or appear damaged. However, 10 CFR 20.1906(b)(1) requires each licensee to monitor the surfaces of a labeled package for radioactive contamination unless the package contains only radioactive material in the form of a gas or in special form as defined in 10 CFR 71.4.

3. Annex F, Appendix 3, "Leak Tests," page 27, in your application appears to reference NCRP Report No.58 "A Handbook of Radioactivity Measurement Procedures". However, the references do not clearly refer to the procedure in the annex:

   a. Item b."Evaluation of Counting System Performance" refers to NCRP Report No.58, p.226. However, page 226 of NCRP Report No.58 discusses inorganic scintillators, conventional liquid-scintillation counting systems and two-scintillation counting techniques.

   b. Item b.(2) "Background Determination" refers to NCRP p.249. However, Page 249 of NCRP Report No.58 discusses techniques used for analysis of X-Ray emitters.

   c. Item b.(3) "Decision Limit" refers to NCRP, p.309. However, page 309 of NCRP Report No.58 discusses X-Ray and Auger-Electron Transitions and Fluorescence Yield.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or omissions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610)-337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

Original Signed By
James M. Bondick

James M. Bondick
Health Physicist
Division of Nuclear Materials Safety

License No. 31-02102-02
Docket No. 030-00897
Control No. 123588

OFFICIAL RECORD COPY

Enclosures:
1. Amendment No. 19
2. 10 CFR Parts 2, 19, 20, 30, and 170
3. NRC Forms 3 and 313

DOCUMENT NAME: R:\WPS\MLTR\L3102102.02

To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI					
NAME	JBondick/jmb							
DATE	02/12/97		02/ /97		02/ /97		02/ /97	

OFFICIAL RECORD COPY

MS-16
Q6

West Point

31-02102-02

DEPARTMENT OF PHYSICS
BARTLETT HALL
U. S. MILITARY ACADEMY
WEST POINT, NEW YORK 10996-1790

UNITED STATES
MILITARY ACADEMY
West Point, New York 1099

FACSIMILE HEADER SHEET

Please deliver this FAX to:	Sender Information:
Name: Jim Bonnett	Name: CPT ALAN DAUS
Organization: NRC	Organization: DPhysics, USMA
FAX Phone: 610-337-5393	FAX Phone: 914-938-5803
Office Phone: 610-337-6951	Office Phone: 914-938-2337
TOTAL PAGES: Header + 1	

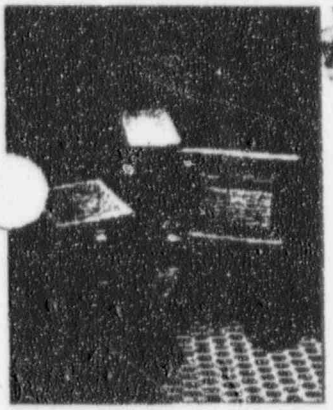
ADDITIONAL REMARKS: Reference mail control # 123588

mr. Bonnett,

Here is a data sheet I have on the Field Ion Spectrometer. I called "MSA" and asked them if they have a model #. They don't. The piece of equipment is a prototype. Please feel free to contact me if this information isn't sufficient for the

Alan Daus
AUTHORIZED SIGNATURE

"To provide the nation with leaders of character who serve the common defense."



[redacted] Spectrometer

Once every few years, a new technology changes the way we think about trace gas analysis. The analytical instrument market demands technologies that give trace level analytical performance while being simple to use, reliable and affordable.

FIS (Field Ion Spectrometry) is a radically new method of analyzing trace gases at sub-parts-per-million, and in many cases sub-parts-per-*billion* concentrations.

FIS is a trace gas analyzer for the future.

How Does FIS work?

The gas to be measured is drawn into an ionizing cavity (rather like a conventional photoionization detector.) The gas is ionized, and the ions are passed between parallel electrodes across which is applied an oscillating electric field. This causes the ions to 'wiggle' along different paths, depending on their mass, size, shape and charge, until they reach either electrode and are neutralized. However, by adding a second compensation field, the ions to be measured pass all the way between the electrodes until they reach a highly sensitive detector.

thermore, by sweeping the compensation field through a voltage ge, a complete spectrum of the gas mixture is produced, and multiple components can be analyzed. Think of the ionogram like an infrared spectrum or a gas chromatogram. But the big difference is that FIS is far more sensitive than IR, and has no moving parts or delicate optical components. And unlike GC, there are no columns to replace, no consumable gases to supply, and no long wait while the chromatogram is run. FIS is fast, selective, and extremely sensitive.

Features and Benefits

- FIS ionization technology has extremely high sensitivity to organophosphorus compounds, halogenated organics, nitro-compounds, aromatics, inorganic acid gases and other species.
- Components are separated electronically, allowing multiple components to be analyzed in seconds.
- Continuous reading mode allows a selected analyte to be measured continuously in a complex background (for example: benzene in gasoline vapor.)
- Dual transverse electric fields reject interferences (including water vapor) without the need for GC columns or other physical separation techniques, reducing costs and increasing reliability.
- Sensor has no delicate grids, gates, mirrors, lenses or moving parts, resulting in high reliability and corrosion/vibration resistance.

  FIS uses no consumables except an easily-refillable, onboard filter cartridge, reducing maintenance time and expense.
- Electronic tuning allows new or changing applications without expensive factory service.

Specifications

Size	0.8 cubic feet, excluding Personal Computer for control and display.
Weight	22 lbs. (10 kg)
Power Consumption	110/220 VAC ±10%; 25w
Classification	General purpose
Detection Limits	<10 ppt (organophosphorus and nitro-organic compounds), 10 ppb for benzene, <100 ppb for HCFC's, solvents, acid gases.
Ionization Sources	Ultraviolet lamp (10.6eV), or optional [redacted] radioisotopic source.
Dynamic Range	typically, 1000:1 with radioisotopic ionizer, 2000:1 for ultraviolet ionizer.
Response Time	< 10 seconds (single component), approximately 10 seconds for each additional component.
Number of components analyzed	Application dependent
Data Handling and Presentation	Microsoft Windows-based GUI interface using external PC. Display of all operating parameters, stacked ionograms, real time concentration display.
Temperature Ranges	-10 to 50 deg C
Humidity Range	5 - 95% RH, non-condensing
Altitude	0 - 5000 meters
Consumables	On-board air purification filter (6 months, customer replaceable).
Shock and Vibration Resistance	Excellent, since FIS has no moving parts.
Maintenance	Minimal. Occasional replenishment of the air purification filters.
Sample handling	Built-in sample draw pump, options for sampling hot or low-volatility materials.

Note: This Bulletin contains only a general description of the MSA Field Ion Spectrometer. While uses and performance capabilities are described, under no circumstances should the product be used except by qualified, trained personnel, and not until the instructions, labels or other literature accompanying the product have been carefully read and understood and the precautions therein set forth followed. Only they contain the complete and detailed information concerning this product.

678-4678

MSA

In U.S, 1-800-MSA-INST or FAX (412) 776-3280
In Canada, 1-800-267-0672 or FAX (416) 663-5908
Elsewhere, MSA International, (412) 967-3228 or FAX (412) 967-3373

Instrument Division: P.O. Box 427, Pittsburgh, PA 15230 U.S.A.

http://www.MSAnet.com

Printed in U.S.A. 9602(L)

(2.6 mCi - N. 63 I.D.+ model # NER-9999)

123588

SECTION COPY

TOTAL P.02

DEC 13 1996

TELEPHONE CONVERSATON RECORD	**Date:** 12/11/96	**Time:** 9 a.m.
Mail Control No.: 123588	**License No.:** 31-02102-02	**Docket No.:** 030-00897
Person Called: CPT Alan Daus	**Organization:** US Military Academy	**Telephone Number: 914-938-2337**
Person Calling: Jim Bondick	**Organization:** NRC	**Telephone Number: 6951**
Subject: Amendment request		
Summary: Spoke to Cpt. Daus about the request to add a DuPont source NER-999 in a field ion spectrometer. Also told him that we needed the manufacturer and model number of the Field Ion Spectrometer. Informed Cpt. Daus that the Model number is not in the SSD registry that I checked, or that the SSD group had checked. Asked him to verify that NER-999 was correct. He thought it was 4 9's instead of 3 (NER-9999) was not able to be located). Asked him to provide the manufacturer's name and model number of the spectrometer and to verify the source model number.		
Action Required/Taken: MS 15		
Signature: Bondick	**Date:** 12/11/96	

ML 10

DEPARTMENT OF THE ARMY
UNITED STATES MILITARY ACADEMY
WEST POINT, NEW YORK 10996

030-00897

REPLY TO
ATTENTION OF

MADN-H (385-11m)

16 September 1996

MEMORANDUM THRU

Environmental Management Office, USMA, ATTN: MAEN-EV, West Point, New York

Superintendent, USMA, ATTN: Safety Officer, West Point, New York 10996

Commander, US Army Materiel Command, ATTN: AMCSF-P, 5001 Eisenhower Avenue, Alexandria, Virginia 22333

FOR US Nuclear Regulatory Commission, Regional 1, Materials Licensing Section, 475 Allendale Road , King of Prussia, Pennsylvania 19406

SUBJECT: Additional Information for Inclusion in License Amendment

1. Request that additional information be included in the US Nuclear Regulatory Commission License BML 31-02102-02, Docket No. 030-00897 with mail control number 123588 issued to Department of Physics, US Military Academy as follows:

An additional source of Nickel-63 (2.6 mCi) manufactured by DuPont, model number NER-999, to be used in a Field Ion Spectrometer (FIS). The FIS will be stored in a chemistry laboratory room that is locked when not in use, and it would require a screwdriver and some knowledge to remove the source.

3. Point of contact for licensing in the Department of Physics is CPT Alan M. Daus, 914-938-2337, DSN 688-2337.

RAYMOND J. WINKEL, Jr
Colonel, Professor USMA
Head of the Department of Physics

OFFICIAL RECORD COPY

ML 10

123588

SEP 23 1996

DEPARTMENT OF THE ARMY
UNITED STATES MILITARY ACADEMY
WEST POINT, NEW YORK 10996

030-00897
31-02102-02

REPLY TO
ATTENTION OF

MADN-H (385-11m)

9 July 1996

MEMORANDUM THRU

Environmental Management Office, USMA, ATTN: MAEN-EV, West Point, New York

Superintendent, USMA, ATTN: Safety Officer, West Point, New York 10996

Commander, US Army Material Command, ATTN: AMCSF-P, 5001 Eisenhower Ave
Alexandria, Virginia 22333

FOR US Nuclear Regulatory Commission, Region 1, Materials Licensing Section,
475 Allendale Road, King of Prussia, Pennsylvania 19406

1. Request that US Nuclear Regulatory Commission License SUD-311, Docket No. 040-05828 issued to Department of Physics, US Military Academy be amended as follows:

a. Request that Alan M. Daus, MS, be designated as the Radiation Protection Officer in place of Debra D. Schnelle, MS, who left this organization in June 1996. CPT Daus is a medical physicist, a member of the faculty and directs the radiation elective courses taught in the Department of Physics. A resume for CPT Daus is enclosed.

b. Request that David J. Frenier, MS, be designated under this license as a user of radioactive materials. A resume for LTC Frenier is enclosed.

c. Request that Thomas J. Rosener, PhD, be designated as a user of radioactive materials and as the Alternate Radiation Protection Officer. LTC Rosener is a nuclear engineer and teaches nuclear engineering courses to college juniors. A resume for LTC Rosener is enclosed.

d. Request that Brian E. Moretti, PhD, be designated as a user of radioactive materials. LTC Moretti is a nuclear engineer and will teach nuclear engineering courses to college juniors. A resume for LTC Moretti is enclosed.

e. Request removal of all personnel from this license except Alan Daus, David Frenier, Thomas Rosener, and Brian Moretti.

2. The environmental impact of this action and alternatives have been reviewed and a Record of Environmental Consideration is enclosed

123588

OFFICIAL RECORD COPY

ML 10

SEP 20 1996

MADN-H
SUBJECT: Amendment to US Nuclear Regulatory Commission License No. SUD-311, Docket No. 040-05828

3. The United States Military Academy (USMA) is a public undergraduate educational institution, accredited by the Middle States Association of Colleges and Schools, offering programs of instruction leading to the Bachelors degree. The USMA is an activity of the United States Army and is supported by appropriated funds. As such it appears to meet your definition of a "nonprofit educational institution" (10 CFR 171.5). Request that USMA be exempt from any fees for this action.

4. Point of contact for licensing in the Department of Physics is CPT Alan M. Daus, (914)-938-2337, DSN 688-2337.

Encl

RAYMOND J. WINKEL, Jr.
COL, PR
Head of the Department of Physics

PHYSICS DEPARTMENT
UNITED STATES MILITARY ACADEMY

RECORD OF ENVIRONMENTAL CONSIDERATION

Project Title: Amendment to US Nuclear Regulatory Commission Licenses No. 31-02102-02 and No. SUD-311 and to DA Radiation Authorization No. A31-10-01

Brief Description:

The Physics Department, USMA has two licenses (No. 31-02102-02 and No. SUD-311) from the Nuclear Regulatory Commission and an Authorization from DA (No. A31-10-01) for the use of radioactive material in educational and research programs. The radioactive materials are used in science and engineering classes, in demonstrations and in laboratory exercises. Licensed radioactive materials are not used in human use, for distribution or resale, or for remunerated services for profit.

Amendment of the licenses and authorization at this time is to identify current users of radioactive materials and to designate a new Radiation Protection Officer. Amendment is necessitated by routine personnel rotation. There are no changes to current operations involving the use of radioactive materials in educational programs of the Department of Physics. Cumulative effects on the environment as a result of this action are minimal.

Anticipated Date and/or duration of proposed action:

Ongoing. Current licenses expire in July, 2001.

Reason for using record of environmental consideration (choose one):

a. Adequately covered in an Environmental Assessment, entitled _____

_____

_____

or,

b. Is qualified for Categorical Exclusion **A-11**, AR-200-2 and no extraordinary circumstances exist as defined in paragraph 4-2.b, AR 200-2.

Prepared by: Alan M. Dana — Date: 10 Jul 96
Radiation Protection Officer, DPHYS

Coordinated with: John A Cubbitt — Date: 22 Jul 96
Radiation Protection Officer, USMA

Reviewed by: Eugene E. Good — Date: 7-26-96
Environmental Coordinator, USMA

NRC FORM 313
(10-87)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires 6-30-90

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [ ] A. NEW LICENSE
- [X] B. AMENDMENT TO LICENSE NUMBER 31-02102-02
- [ ] C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Department of Physics
United States Military Academy
West Point, New York 10996-1790

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Bartlett Hall, Bldg 753
West Point, New York 10996-1790

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

CPT Alan M. Daus

TELEPHONE NUMBER

(914)938-2337

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.
Annex A

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.
Annex B and Annex I

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.
Annex C

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.
Annex D

9. FACILITIES AND EQUIPMENT.
Annex E

10. RADIATION SAFETY PROGRAM.
Annex F

11. WASTE MANAGEMENT.
Annex G

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*
FEE CATEGORY Exempt 10CFR 170.11 (a) (5)
AMOUNT ENCLOSED $

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR 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.

SIGNATURE–CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
R J Winkel Jr	RAYMOND J. WINKEL, Jr. COL, Professor, USMA	Head of the Department of Physics	15 Aug 96

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
AMOUNT RECEIVED	CHECK NUMBER			DATE

This is to acknowledge the receipt of your letter/application dated 8/15/96, and to inform you that the initial processing which includes an administrative review has been performed.

☐ There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☒ Please provide to this office within 30 days of your receipt of this card Concurrence/Endorsement thru U.S. ARMY MATERIEL Command.

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 123588. When calling to inquire about this action, please refer to this control number. You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader

OFFICIAL RECORD COPY ML 10

NRC FORM 313
(10-87)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 6-30-90

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCLEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

030-00897

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [ ] A. NEW LICENSE
- [X] B. AMENDMENT TO LICENSE NUMBER 31-02102-02
- [ ] C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Department of Physics
United States Military Academy
West Point, New York 10996-1790

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Bartlett Hall, Bldg 753
West Point, New York 10996-1790

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

CPT Alan M. Daus

TELEPHONE NUMBER: (914)938-2337

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL. a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time. Annex A

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED. Annex B and Annex I

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE. Annex C

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS. Annex D

9. FACILITIES AND EQUIPMENT. Annex E

10. RADIATION SAFETY PROGRAM. Annex F

11. WASTE MANAGEMENT. Annex G

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*
FEE CATEGORY: Exempt 10CFR 170.11 (a) (5)
AMOUNT ENCLOSED $

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR 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.

SIGNATURE–CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
[signature]	RAYMOND J. WINKEL, Jr. COL, Professor, USMA	Head of the Department of Physics	15 Aug 96

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TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
			OFFICIAL RECORD COPY ML 10	123588
AMOUNT RECEIVED	**CHECK NUMBER**			**DATE**
				AUG 21 1996

PHYSICS DEPARTMENT
UNITED STATES MILITARY ACADEMY

RECORD OF ENVIRONMENTAL CONSIDERATION

Project Title: Amendment to US Nuclear Regulatory Commission Licenses No. 31-02102-02 and No. SUD-311 and to DA Radiation Authorization No. A31-10-01

Brief Description:

The Physics Department, USMA has two licenses (No. 31-02102-02 and No. SUD-311) from the Nuclear Regulatory Commission and an Authorization from DA (No. A31-10-01) for the use of radioactive material in educational and research programs. The radioactive materials are used in science and engineering classes, in demonstrations and in laboratory exercises. Licensed radioactive materials are not used in human use, for distribution or resale, or for remunerated services for profit.

Amendment of the licenses and authorization at this time is to identify current users of radioactive materials and to designate a new Radiation Protection Officer. Amendment is necessitated by routine personnel rotation. There are no changes to current operations involving the use of radioactive materials in educational programs of the Department of Physics. Cumulative effects on the environment as a result of this action are minimal.

Anticipated Date and/or duration of proposed action:

Ongoing. Current licenses expire in July, 2001.

Reason for using record of environmental consideration (choose one):

a. Adequately covered in an Environmental Assessment, entitled _____

_____

_____

or,

b. Is qualified for Categorical Exclusion **A-11**, AR-200-2 and no extraordinary circumstances exist as defined in paragraph 4-2.b, AR 200-2.

Prepared by: Alan M. Dana — Radiation Protection Officer, DPHYS — Date: 10 Jul 96

Coordinated with: John A Cubbage — Radiation Protection Officer, USMA — Date: 22 Jul 96

Reviewed by: Eugene E. Good — Environmental Coordinator, USMA — Date: 7-26-96

DEPARTMENT OF THE ARMY
UNITED STATES MILITARY ACADEMY
WEST POINT, NEW YORK 10996

REPLY TO
ATTENTION OF

MADN-H (385-11m)

2 July 1996

MEMORANDUM THRU

Environmental Management Office, USMA, ATTN: MAEN-EV, West Point, New York

Superintendent, USMA, ATTN: Safety Officer, West Point, New York 10996

Commander, US Army Material Command, ATTN: AMCSF-P, 5001 Eisenhower Ave, Alexandria, Virginia 22333

FOR US Nuclear Regulatory Commission, Region 1, Materials Licensing Section, 475 Allendale Road, King of Prussia, Pennsylvania 19406

SUBJECT: Amendment to US Nuclear Regulatory Commission License No. BML 31-02102-02, Docket No. 030-00897

1. Request that US Nuclear Regulatory Commission License BML 31-02102-02, Docket No. 030-00897 issued to Department of Physics, US Military Academy be amended as follows:

a. Request that Alan M. Daus, MS, be designated as the Radiation Protection Officer in place of Debra D. Schnelle, MS, who left this organization in June 1996. CPT Daus is a medical physicist, a member of the faculty and directs the radiation elective courses taught in the Department of Physics. A resume for CPT Daus is enclosed.

b. Request that David J. Frenier, MS, be designated under this license as a user of radioactive materials. A resume for LTC Frenier is enclosed.

c. Request that Thomas J. Rosener, PhD, be designated as a user of radioactive materials and as the Alternate Radiation Protection Officer. LTC Rosener is a nuclear engineer and teaches nuclear engineering courses to college juniors. A resume for LTC Rosener is enclosed.

d. Request that Brian E. Moretti, PhD, be designated as a user of radioactive materials. LTC Moretti is a nuclear engineer and will teach nuclear engineering courses to college juniors. A resume for LTC Moretti is enclosed.

e. Request removal of all personnel from this license except Alan Daus, David Frenier, Thomas Rosener, and Brian Moretti.

MADN-H
SUBJECT: Amendment to US Nuclear Regulatory Commission License No. BML 31-02102-02 Docket No. 030-00897

2. The environmental impact of this action and alternatives have been reviewed and a Record of Environmental Consideration is enclosed.

3. The United States Military Academy (USMA) is a public undergraduate educational institution, accredited by the Middle States Association of Colleges and Schools, offering programs of instruction leading to the Bachelors degree. The USMA is an activity of the United States Army and is supported by appropriated funds. As such it appears to meet your definition of a "nonprofit educational institution" (10 CFR 171.5). Request that USMA be exempted from any fees for this action.

4. Point of contact for licensing in the Department of Physics is CPT Alan M. Daus, (914)938-2337, DSN 688-2337.

Encl

RAYMOND J. WINKEL, Jr.
COL, PR
Head of the Department of Physics

RADIATION PROTECTION PROGRAM

1. **Purpose.** This section of the Department of Physics SOP establishes ionizing radiation protection policy and procedures to meet Federal and DA regulatory requirements and to keep personnel exposures to ionizing radiation as low as reasonably achievable (ALARA).

2. **Responsibilities.** The Head of the Department of Physics has overall responsibility for assuring the safe performance of activities involving the use of ionizing radiation and adherence to Federal and DA requirements in the Department of Physics.

a. Radiation Control Committee. The Radiation Control Committee (RCC) will oversee the operation of the radiation protection program (Annex F).

b. Radiation Protection Officer. The Radiation Protection Officer (RPO) will manage the radiation protection program (Annex F) for the Head of the Department of Physics.

c. Instructors using ionizing radiation sources. Radiation safety of cadets, instructors, and others at in the Department of Physics is primarily the responsibility of the instructor using the radiation source (paragraph 68, NCRP Report No. 32). This person will consult with the RPO as necessary to insure safety of all personnel and compliance with all Federal and DA radiation protection requirements. The safety procedures for each experiment in the Department of Physics which uses a radioactive source, and the responsibilities of the supervising instructor are detailed in Annex I.

3. **Exceptions.** Exceptions to the Department of Physics Radiation Protection SOP may be granted on a case-by-case basis by the RPO provided that such exceptions do not endanger personnel or property and do not violate Federal or DA regulations, NRC license conditions, or DA radiation authorization conditions. The RPO will document the exception granted and it will be reviewed by the RCC at its next meeting.

4. **Specific instructions.** Specific radiation protection instructions about the use of the larger radioactive sources and ionizing-radiation producing devices in the Department of Physics are in Annex I to this section of the Department of Physics SOP.

5. **Reporting of defects and non-compliance.** All alleged defects and items of non-compliance involving radiation will be reported to the RPO. The RPO will begin an investigation within one duty day after the report and take immediate corrective action if warranted. The RPO will report the defect or item of non-compliance, along with an evaluation and recommendation to the RCC, upon termination of the investigation. If the RCC finds that the defect or item of non-compliance exists or existed and constitutes a significant hazard, the Chairman of the RCC and the RPO will make the appropriate notifications in accordance with 10 CFR 21 and 10CFR20.2202.

6. **List of annexes.**

a. Annex A: Licensed Radioactive Material
   (1) Appendix 1: Byproduct Material License
   (2) Appendix 2: Subcritical Assembly License

b. Annex B: Purposes for Which Licensed Material Will Be Used
   (1) Appendix 1: Byproduct Material License
   (2) Appendix 2: Subcritical Assembly License

c. Annex C: Training and Experience of Individuals Responsible for Radiation Safety Program
   (1) Appendix 1: David J. Frenier (authorized user)
   (2) Appendix 2: Thomas J. Rosener (alternate RPO/authorized user)
   (3) Appendix 3: Alan M. Daus (RPO)
   (4) Appendix 4: Brian E. Moretti (authorized user)

d. Annex D: Training for Individuals Working in or Frequenting Restricted Areas.

e. Annex E: Facilities and Equipment.
   (1) Appendix 1: Description of Facilities
   (2) Appendix 2: Survey of Instruments
   (3) Appendix 3: Personnel Dosimetry

f. Annex F: Radiation Safety Program.
   (1) Appendix 1: Radiation Control Committee
   (2) Appendix 2: Radiation Protection Officer
   (3) Appendix 3: Leak Tests
   (4) Appendix 4: General Instructions for the Safe Use of Radioactive Sources
   (5) Appendix 5: Ordering and Receiving
   (6) Appendix 6: Opening Packages
   (7) Appendix 7: Area Survey Procedures
   (8) Appendix 8: Neutron Monitoring

g. Annex G: Waste Management.

h. Annex H: References

i. Annex I: Radiation protection instructions for use of the larger radioactive sources and the van de Graaf accelerator.
   (1) Appendix 1: The van de Graaf Accelerator
   (2) Appendix 2: Subcritical Facility and Neutron Howitzer
   (3) Appendix 3: Compton Effect Experiment
   (4) Appendix 4: Mossbauer Experiment

ANNEX A: Licensed Radioactive Material

1. **Appendix 1: Byproduct Material License (BML 31-02102-02).**

Element & Mass No.	Physical Form	Max Amount
Any byproduct material with atomic numbers 1-91	Sealed Sources	Not to exceed 10 µCi/source and 200 µCi total
Nickel 63	Plated sources in Hewlett-Packard Model 19713A detector cells	45 mCi; not to exceed 15 mCi per detector cell
Cesium 137	Sealed Sources	50 mCi total for a single source
Plutonium 239	Sealed solid neutron sources (Monsanto)	80 grams total in 5 sealed containers; 1000 mCi each
Americium 241	Sealed Source (Amersham-Searle Mdl AMC 2084)	10 mCi
Americium 241	Sealed Source (Kevox Ray Mdl 0122)	50 mCi
Americium 241	Sealed Source (Isotope Products Laboratories Mdl AN-241-25)	25 mCi
Cadmium 109	Sealed Source (Isotope Products Laboratories Mdl AN-109-25)	25 mCi
Iron 55	Sealed Source (Isotope Products Laboratories Mdl AN-55-25)	25 mCi

ANNEX B: Purposes For Which Licensed Material Will Be Used

1. **Appendix 1: Byproduct Material License (BML 31-02102-02).**

Any byproduct material with atomic numbers 1-91	Demonstrations and training of students
Nickel 63	Gas chromatographs
Cesium 137	Compton scattering experiments for the instruction of students
Plutonium 239	Used in conjunction with a subcritical assembly
Americium 241	X-ray studies (spectroscopy) and demonstrations.
Americium 241	X-ray studies (spectroscopy) and demonstrations.
Americium 241	X-ray studies (spectroscopy) and demonstrations.
Cadmium 109	X-ray studies (spectroscopy) and demonstrations.
Iron 55	X-ray studies (spectroscopy) and demonstrations.

ANNEX C: Training and Experience of Individuals Responsible for Radiation Safety Program

1. Appendix 1: DAVID J. FRENIER

a. Education.

B.S. in physics from United States Military Academy, West Point, New York, 1975.
M.S. in engineering physics from University of Virginia, Charlottesville, Virginia, 1986.

b. Training. Training and experience at the Department of Physics, United States Military Academy was conducted under the supervision of LTC Alfred Costantine, Radiation Protection Officer, and MAJ Scott Tousely, authorized user of the department NRC license.

Category A: Principles and Practice of Radiation Protection
Category B: Radioactivity Measurement Standardization and Monitoring
Category C: Mathematics and Calculations Basic to the Use and Measurement of Radioactivity
Category D: Biological Effects of Radiation
Category E: Radioactive Waste Disposal

CATEGORY	*LOCATION OF TRAINING*	*DATE/DURATION*	*TYPE OF TRAINING*
A,B,C,D	Department of Physics, United States Military Academy, West Point, NY	120 hrs	Classes
A,B,C,D	Department of Nuclear Engineering & Engineering Physics, University of Virginia, VA	1984 - 1986	Classes/Laboratory Experience
A,B,C,D	Department of Physics, United States Military Academy, West Point, NY	1986 - 1989 Jul 93 - present	On the job
A,B,C,D	U.S. Army NBC Defense School	40 hrs (1977)	Classes
A,B,C,D,E	Department of Physics, United States Military Academy, West Point, NY	Jul 93 - present	On the job

c Experience with Isotopes

ISOTOPE	*MAXIMUM ACTIVITY*	*DURATION OF EXPERIENCE*	*TYPE OF EXPERIENCE*
Atomic No.s 1-91	10 mCi	Jun 86 - May 89 May 93 - present	Sealed Sources
Ni-63	15 mCi	Jun 86 - May 89 May 93 - present	Gas Chromatograph
Ra-226	1.0 uCi	Jun 86 - May 89 May 93 - present	Reference source
Th-230	General licensed quantity	Jun 86 - May 89 May 93 - present	Reference source
Uranium	2500 kg	Jun 86 - May 89 May 93 - present	Light Water Moderated Subcritical Assembly
Am-241	50 mCi	Jun 86 - May 89 May 93 - present	Sealed Source
Pu-239	80 g	Jun 86 - May 89 May 93 - present	Sealed neutron source
Cs-137	50 mCi	Jun 86 - May 89 May 93 - present	Sealed Source
Co-57	12 mCi	Jun 86 - May 89 May 93 - present	Experimental source

2. Appendix 2: THOMAS J. ROSENER

a. Education.

B.S. in nuclear engineering from United States Military Academy, West Point, New York, 1976.
M.S. in nuclear engineering from Rensselaer Polytechnic Institute, Troy, New York, 1985.
M.B.A. from C.W. Post (Long Island University), 1988.
M.S. in engineering physics from Rensselaer Polytechnic Institute, Troy, New York, 1991.
Ph.D. in nuclear engineering and science from Rensselaer Polytechnic Institute, Troy, New York, 1992.

b. Training. Training and experience at the Department of Physics, United States Military Academy was conducted under the supervision of MAJ Debra Schnelle, Radiation Protection Officer, and MAJ James Petrosky, authorized user of the department NRC license.

Category A: Principles and Practice of Radiation Protection
Category B: Radioactivity Measurement Standardization and Monitoring
Category C: Mathematics and Calculations Basic to the Use and Measurement of Radioactivity
Category D: Biological Effects of Radiation
Category E: Radioactive Waste Disposal

CATEGORY	*LOCATION OF TRAINING*	*DATE/DURATION*	*TYPE OF TRAINING*
A,B,C,D	Department of Physics, United States Military Academy, West Point, NY	120 hrs 1972 -1976	Classes
A,B,C,D	U.S. Army NBC Defense School, Fort Sill, OK	40 hrs (1977)	Classes
A,B,C,D,E	Department of Nuclear Engineering & Engineering Physics, Rensselaer Polytechnic Institute, Troy, NY	1983 - 1985 1989 - 1992	Classes/Laboratory Experience
A,B,C,D,E	Department of Physics, United States Military Academy, West Point, NY	1985 - 1988 Aug 95 - present	On the job

c. Experience with Isotopes

ISOTOPE	*MAXIMUM ACTIVITY*	*DURATION OF EXPERIENCE*	*TYPE OF EXPERIENCE*
Atomic No.s 1-91	10 mCi	Aug 83 - May 85 Aug 89 - Jul 92	Sealed Sources
Cs-137	5 Ci source	Jan 83 -May 83	Sealed Source
Uranium	1800 kg (commercial grade fuel)	Jan 91 - May 91	Light Water Moderated Critical Facility at RPI
Atomic No.s 1-91	10 mCi	Jul 85 - Jun 88 Aug 95 - present	Sealed Sources
Ni-63	15 mCi	Jul 85 - Jun 88 Aug 95 - present	Gas Chromatograph
Ra-226	1.0 uCi	Jul 85 - Jun 88 Aug 95 - present	Reference source
Th-230	General licensed quantity	Jul 85 - Jun 88 Aug 95 - present	Reference source
Uranium	2500 kg	Jul 85 - Jun 88 Aug 95 - present	Light Water Moderated Subcritical Assembly
Am-241	50 mCi	Jul 85 - Jun 88 Aug 95 - present	Sealed Source
Pu-239	80 g	Jul 85 - Jun 88 Aug 95 - present	Sealed neutron source
Cs-137	50 mCi	Jul 85 - Jun 88 Aug 95 - present	Sealed Source
Co-57	12 mCi	Jul 85 - Jun 88 Aug 95 - present	Experimental source

3. Appendix 3: ALAN M. DAUS

a. Education.

B.A. in physics from Ripon College, Ripon, Wisconsin, 1986.
M.S. in medical physics from University of Oklahoma, Oklahoma City, Oklahoma, 1995.

b. Training. Training and experience at the Department of Physics, United States Military Academy was conducted under the supervision of MAJ Debra Schnelle, Radiation Protection Officer, and MAJ James Petrosky, authorized user of the department NRC license. Training and experience at the University of Oklahoma, Oklahoma under the supervision of Doctors John R. Prince and Sasha Mohapatra.

Category A: Principles and Practice of Radiation Protection
Category B: Radioactivity Measurement Standardization and Monitoring
Category C: Mathematics and Calculations Basic to the Use and Measurement of Radioactivity
Category D: Biological Effects of Radiation
Category E: Radioactive Waste Disposal

CATEGORY	*LOCATION OF TRAINING*	*DATE/DURATION*	*TYPE OF TRAINING*
A,B,C,D	Department of Physics, United States Military Academy, West Point, NY	120 hrs	Classes
A,B,C,D,E	Department of Radiology , University of Oklahoma, OK	1993 - 1995	Classes/Laboratory Experience
A,B,C,D	U.S. Army NBC Defense School	40 hrs (1987)	Classes
A,B,C,D,E	Department of Physics, United States Military Academy, West Point, NY	Jul 93 - present	On the job

c. Experience with Isotopes

ISOTOPE	*MAXIMUM ACTIVITY*	*DURATION OF EXPERIENCE*	*TYPE OF EXPERIENCE*
Atomic No.s 1-91	10 mCi	Jul 95 - present	Sealed Sources
Ni-63	15 mCi	Jul 95 - present	Gas Chromatograph
Ra-226	1.0 uCi	Jul 95 - present	Reference source
Th-230	General licensed quantity	Jul 95 - present	Reference source
Uranium	2500 kg	Jul 95 - present	Light Water Moderated Subcritical Assembly
Am-241	50 mCi	Jul 95 - present	Sealed Source
Pu-239	80 g	Jul 95 - present	Sealed neutron source
Cs-137	50 mCi	Jul 95 - present	Sealed Source
Co-57	12 mCi	Jul 95 - present	Experimental source
Tc-99m	100 mCi	Jan 94-May 95	Experimental source

3. Appendix 4: BRIAN E. MORETTI

a. Education.

B.S. in physics from United States Military Academy, West Point, New York, 1976.
M.E. in engineering physics from University of Virginia, Charlottesville, Virginia, 1984.
Ph.D. in Nuclear Engineering and Science from Rensselaer Polytechnic Institute, Troy, New York.

b. Training. Training and experience at the Department of Physics, United States Military Academy was conducted under the supervision of COL Robert Cherry, Radiation Protection Officer and authorized user of the department NRC license.

Category A: Principles and Practice of Radiation Protection
Category B: Radioactivity Measurement Standardization and Monitoring
Category C: Mathematics and Calculations Basic to the Use and Measurement of Radioactivity
Category D: Biological Effects of Radiation
Category E: Radioactive Waste Disposal

CATEGORY	*LOCATION OF TRAINING*	*DATE/DURATION*	*TYPE OF TRAINING*
A,B,C,D	Department of Physics, United States Military Academy, West Point, NY	60 hrs	Classes
A,B,C,D	Department of Nuclear Engineering & Engineering Physics, University of Virginia, VA	1982 - 1984	Classes/Laboratory Experience
A,B,C,D	Department of Physics, United States Military Academy, West Point, NY	1984 - 1987	On the job
A,B,C,D,E	Department of Nuclear Engineering, Rensselaer Polytechnic Institute, NY	Jul 93 - present	Classes/Laboratory Experience

c Experience with Isotopes

ISOTOPE	*MAXIMUM ACTIVITY*	*DURATION OF EXPERIENCE*	*TYPE OF EXPERIENCE*
Atomic No.s 1-91	10 mCi	Jun 84 - May 87	Sealed Sources
Ni-63	15 mCi	Jun 84 - May 87	Gas Chromatograph
Ra-226	1.0 uCi	Jun 84 - May 87	Reference source
Th-230	General licensed quantity	Jun 84 - May 87	Reference source
Uranium	2500 kg	Jun 84 - May 87	Light Water Moderated Subcritical Assembly
Am-241	50 mCi	Jun 84 - May 87	Sealed Source
Pu-239	80 g	Jun 84 - May 87	Sealed neutron source
Cs-137	50 mCi	Jun 84 - May 87	Sealed Source
Co-57	12 mCi	Jun 84 - May 87	Experimental source

ANNEX D: TRAINING PROGRAM

Radiation protection training responsibilities are shared by the RPO and instructors using radioactive material.

1. The RPO (or an authorized user) will train all radiation workers and distribute appropriate handouts during the training. Both the training and the receipt of the handouts will be documented.

(a) Frequency of training. Radiation workers will be properly instructed:

(1) Before assuming duties with, or in the vicinity of, radioactive material or radiation-producing devices.

(2) During annual refresher training.

(3) Whenever there is a significant change in duties, regulations, or conditions of NRC licenses or DA radiation authorizations.

(b) The training will meet the guidelines outlined in NRC Regulatory Guide 8.29, "Instruction Concerning Risks From Occupational Radiation Exposure" in addition to the following topics:

(1) All conditions of licenses and radiation authorizations pertinent to radiation protection.

(2) Notice of areas where radioactive material or radiation producing devices are used or stored.

(3) Potential hazards associated with radioactive material and radiation-producing devices.

(4) Radiation protection procedures appropriate to their respective duties, as outlined in Annex F.

(5) Pertinent Federal, DA, and Department of Physics regulations.

(6) Obligation to report unsafe conditions to the RPO.

(7) Appropriate response to emergencies or unsafe conditions.

(8) Right to be informed of radiation exposures.

(9) Procedures to follow in event of pregnancy.

(10) Locations where notices, pertinent regulations, licenses, and radiation authorizations (including conditions, applications, and related correspondence) are posted or are available.

(11) Right to communicate directly with the NRC concerning safety concerns (as outlined in NRC Form 3).

2. The RPO or an authorized user will escort ancillary personnel (for example, building custodians and maintenance personnel) whose duties may require them to work in B17 or BH100. If such an escort is impractical, then the RPO or an authorized user will brief the personnel concerning the radiation hazards in the area and appropriate precautions and this training will be documented. BH100 will ***not*** be considered a radiation area when neither the Mossbauer or Compton sources are present.

3. Pregnant women will receive additional training and counseling, in accordance with NRC Reg Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure." This counseling will also be documented. Dosimetry requirements for pregnant women are addressed in Annex E.

ANNEX E: FACILITIES AND EQUIPMENT

1. **Appendix 1: Description of facilities.** *[Subpart 1: Storage & Control of Licensed Material]*

a. Location of Materials. *[20.1807: Security of Stored Material and 20.1802: Control of Material Not in Storage]*

(1) The primary use and storage site, Room B17, Bartlett Hall, is a basement laboratory room surrounded by hallways and two adjacent office areas. Diagrams of the room with gamma and neutron dose rates annotated are attached (Figures 1a and 1b).

Access to the eastern end of Rm B17 is controlled by the RPO and the authorized users on the license. The subcritical assembly (described below) is located in the eastern area as is the neutron howitzer (described below) containing the PuBe neutron sources and the lead lined storage vault for the department's sealed sources. The remainder of the room is used for a classroom only for students who are participating in experiments that use the neutron howitzer or subcritical assembly. If the subcritical assembly is operating and is to be left unattended by the authorized user (for material activation purposes), then the room is secured with an additional locked grating to which only the RPO and the authorized users have keys.

(2) Fuel slugs that are not in use are stored in the original shipping crate inside the controlled access area. A lock has been placed on the crate and only the RPO and authorized users have access to the key.

(3) The Compton and Mossbauer advanced laboratory experiments are conducted in Room BH100, Bartlett Hall. This room is a laboratory room surrounded by two outside building walls, an adjacent classroom area, and an adjacent laboratory room. A diagram of the room with typical exposure rates (when both the Comptom and Mossbauer sources are present) is attached (Figure 2).

(4) The Van de Graff generator is located in a basement laboratory room, BH01, surrounded by two adjacent laboratory rooms and a machine shop. A diagram of the room is attached; area surveys when the linear accelerator is in operation show no exposure above background (Figure 3).

b. Description of Materials.

(1) The subcritical assembly was manufactured by the Universal Nuclear Corporation of New York. It contains approximately 2400 kg of natural uranium fuel and uses light water as a moderator. Its effective multiplication is 0.86 ± 0.01.

SUB CRITICAL ASSEMBLY NOT LOADED
(5 Ci in the neutron howitzer)

Maximum Surface Readings	3.4 mR/hr (gammas)
Base of Neutron Howitzer	5.0 mRem/hr (neutrons)

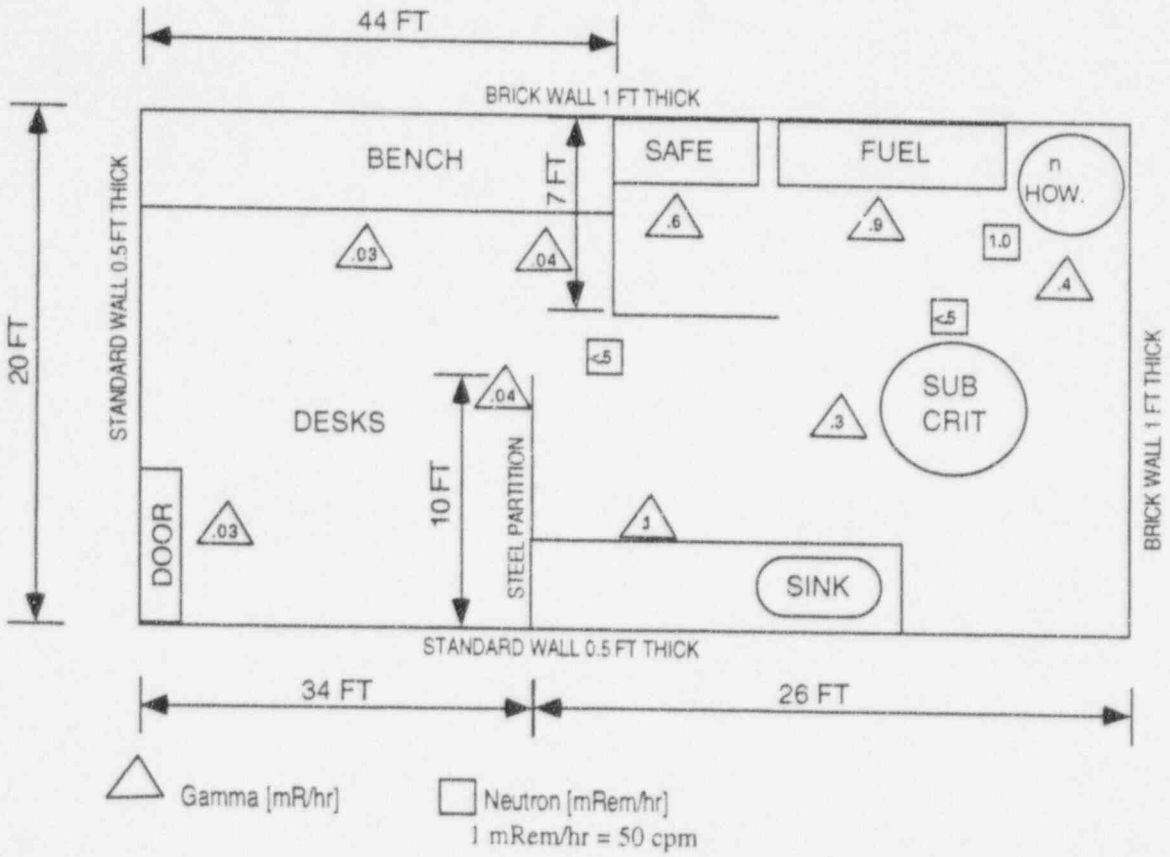


FIGURE 1a

SUB CRITICAL ASSEMBLY LOADED
(5 Ci in the Sub-Crit)

Maximum Surface Readings 1.6 mR/hr (gammas)
Base of Sub Crit 0.5 mRem/hr (neutrons)

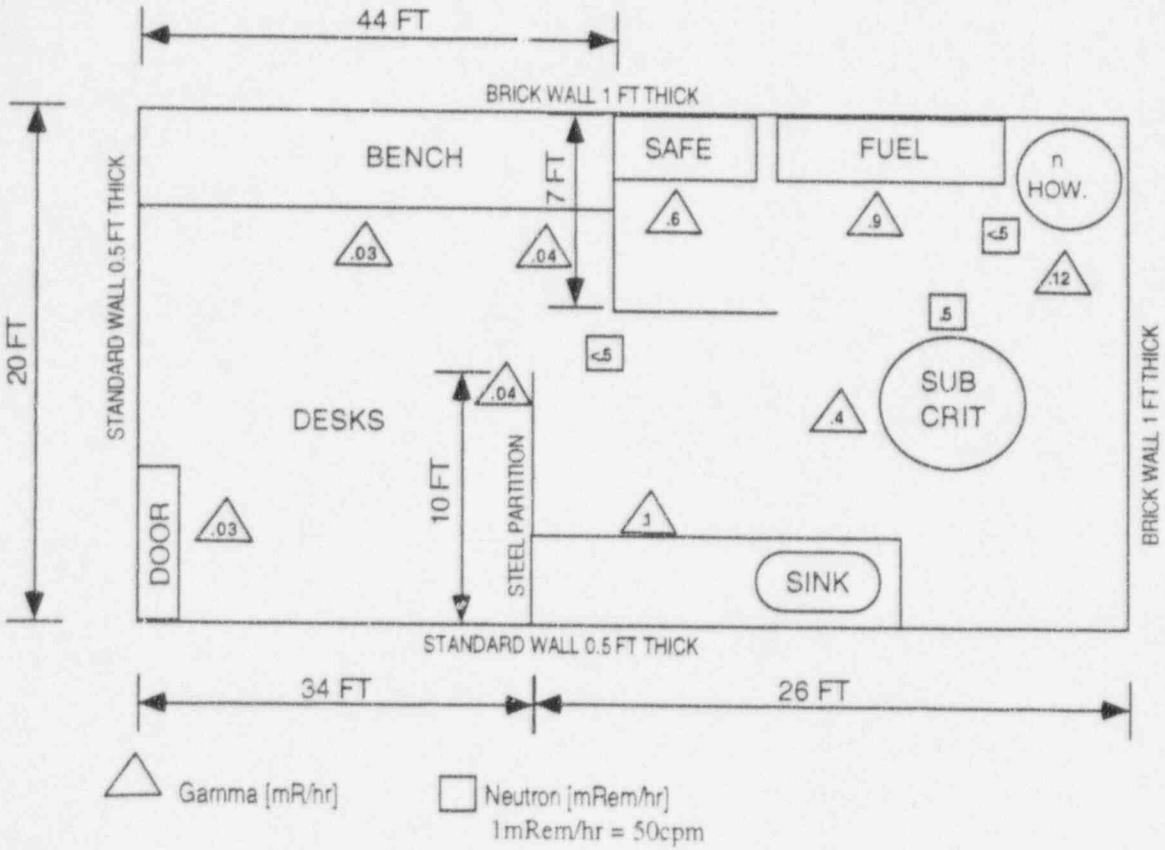


FIGURE 1b

BARTLETT HALL ROOM 100 C
(Mossbauer and Compton sources in room.)

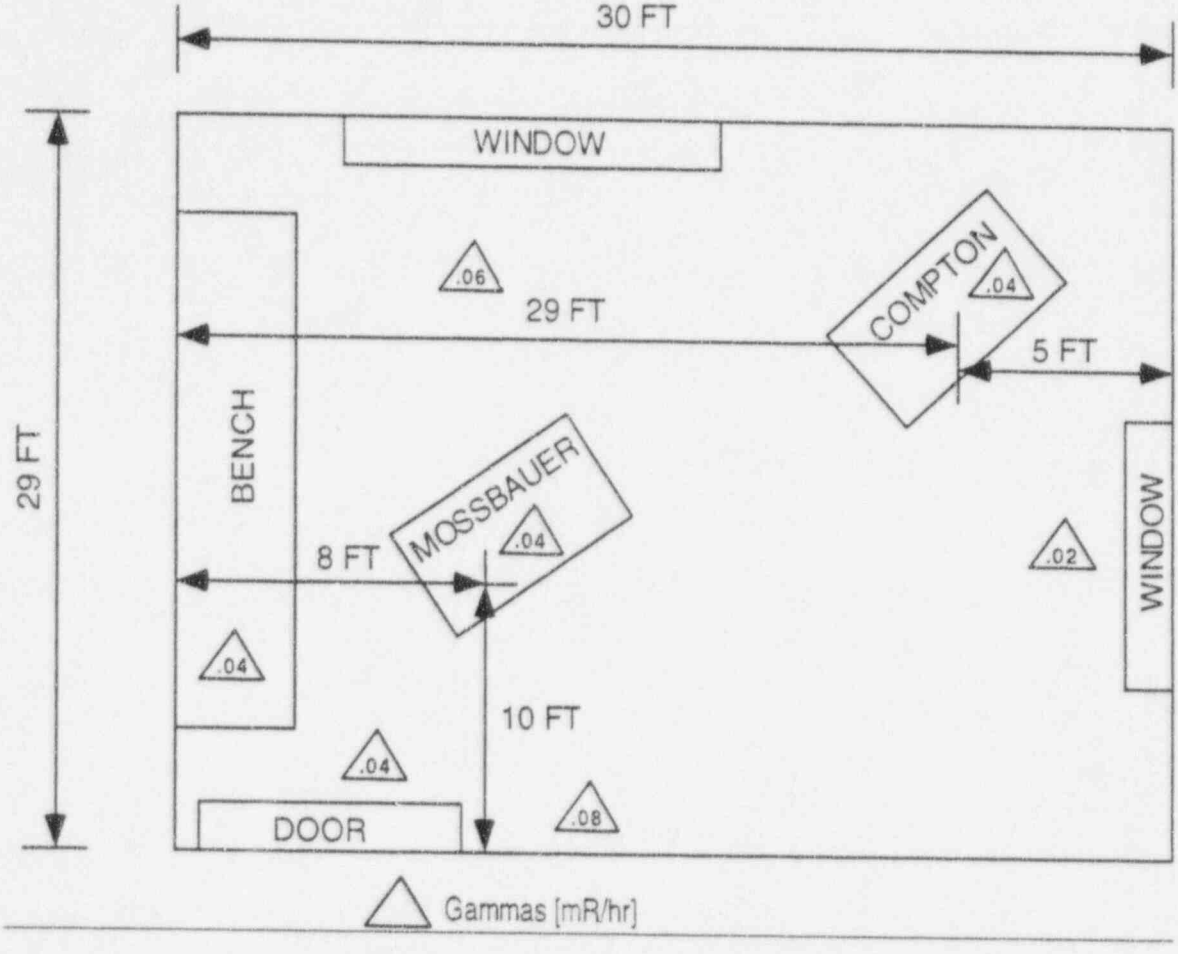


FIGURE 2

PARTICLE ACCELERATOR ROOM
(Not in operation)

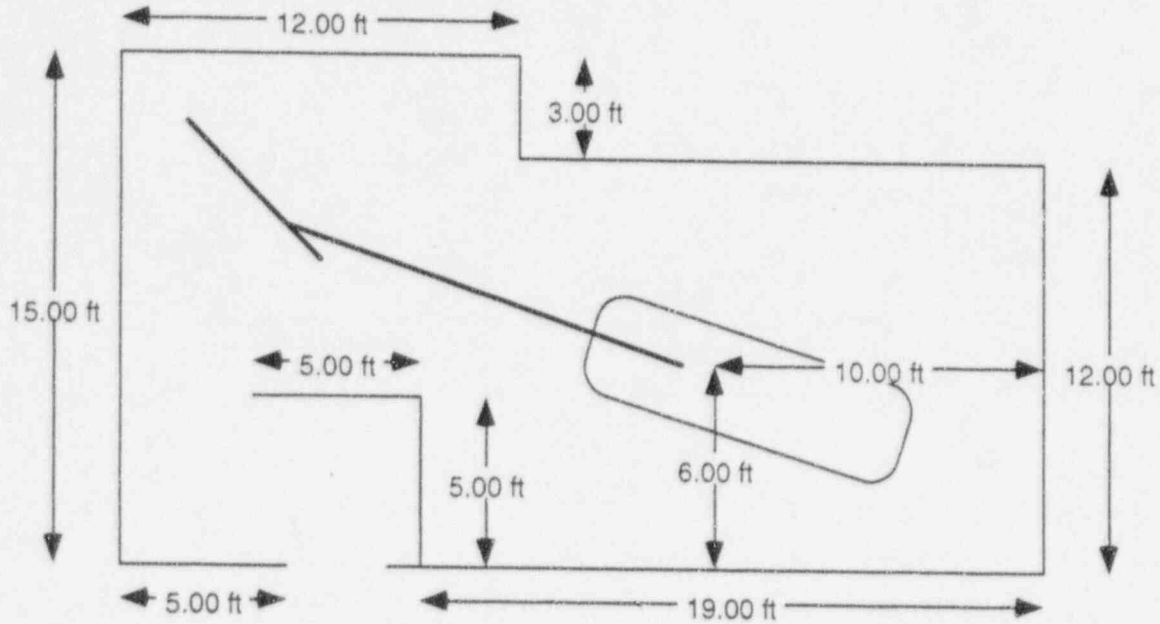


FIGURE 3

(2) The neutron howitzer was manufactured by the Nuclear Chicago Corporation (Model NH 3). It uses paraffin as a moderating medium and is cadmium shielded. The access lid is key locked and the entire howitzer is secured by chain to a bolt in the floor.

(3) The linear accelerator facility is comprised of a High Voltage Engineering Corporation LC-400 (Low Cost) and a High Voltage Engineering Corporation AN-400 (Research Grade) single ended Van de Graaff accelerator. Both of these accelerators are single ended, belt driven Van de Graaff accelerators with rated terminal potentials of 400 kV and radio-frequency ion sources.

2. **Appendix 2: Survey Instruments.**

a. Radiation Detection Instrumentation.

(1) Survey Meters. An appropriate number of the following types of instruments will be available in order to meet classroom needs and perform health and safety area surveys.

TYPE	MAKE	MODEL	RADIATION DETECTED	SENSITIVITY RANGE	NUMBER AVAILABLE
GM	Eberline	E-140	beta, gamma	0.01-50 mR/hr	6
Ion Chamber	Victoreen	450	alpha, beta, gamma, x-ray	0.01-50 mR/hr	2
Ion Chamber	Victoreen	Thyac III	beta, gamma	0.01-20 mR/hr	1

(2) Scalers (used for evaluating leak tests). An appropriate number of the following types of instruments will be available in order to meet classroom needs and perform health and safety area surveys.

TYPE	MAKE	MODEL	RADIATION DETECTED	SENSITIVITY/ EFFICIENCY	NUMBER AVAILABLE
GM	Eberline	PRS1 w/HP210 probe	alpha, beta	0.01-100 mR/hr	2
Ion Chamber	Eberline	ESP-1 w/ AC-3 probe	alpha, beta	14% Pu/ 22% Cs-137	1
Ion Chamber	Eberline	ESP-2 w/AC-3 probe	alpha, beta	14% Pu/ 22% Cs-137	2
Ion Chamber	Eberline	ESP-2 w/ABP-100 probe	alpha, beta, gamma	19% Pu/ 1650 cpm/mR/hr	

(3) Neutron Monitors. An appropriate number of the following types of instruments will be available in order to meet classroom needs and perform health and safety area surveys.

TYPE	MAKE	MODEL	RADIATION DETECTED	DETECTION RANGE	NUMBER AVAILABLE
9" Poly	Eberline	RM16 w/NRD1	neutron	0.5-10^4 mrem/hr	1
9" Poly NRD-1	Ludlum	177-50	neutron	10-10^5 cpm	3

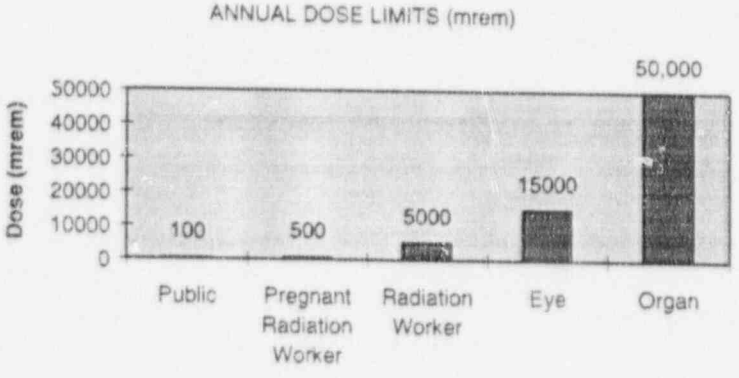
b. Calibration. *[Subpart F: Surveys and Monitoring; 20.1501: General]* All survey instruments will be calibrated annually. In order to meet U.S. Army guidelines (Army Technical Bulletin 43-180), survey meters will be calibrated quarterly when possible; at the U.S. Army TMDE Support Center in Tobyhanna {address: AMXTM-GA-T, Bldg 12, 11 Middleway Road, Tobyhanna, PA 18466-5104} for the beta-gamma survey meters and at the U.S. Army TMDE Activity at Redstone Arsenal {address: AMXTM-SS, Bldg 5435, Redstone Arsenal, AL 35895-5400} for the neutron monitors. A two point calibration on each scale of the instrument is performed with the points located at approximately 1/3 and 2/3 or full scale. An instrument is considered properly calibrated when the instrument readings are within 10% of the known value at each point checked. The beta-gamma calibrations are conducted using a Co-60 source.

3. **Appendix 3: Personnel Dosimetry Program.** Persons designated as radiation workers by the RPO wear thermoluminescent dosimeters (TLDs) provided by the U.S. Army Ionizing Radiation Dosimetry Center at Redstone Arsenal, Alabama. This dosimetry service is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). The dosimeters are exchanged on a quarterly basis and the RPO must approve all dosimeter storage locations [DA PAM 40-18, 3-4 (e)]. All individuals are charged to ensure that all personnel exposures are kept as low as reasonably achievable.

The following guidelines for the remainder of this annex are for internal use only and are not to be considered as NRC license conditions.

(a) Dose limits. *[Subpart C: Occupational Dose Limits]*

(1) Annual dose limits. *[20.1201, 20.1301: Occupational Dose Limits]*



(2) Investigational dose limits. For a Level I investigation, an inquiry into the possible causes of the overexposure and ways of preventing a reoccurrence will be conducted and presented to the RCC. For a Level II investigation, if a cause for the overexposure is determined, then the RCC will discuss the means of preventing that cause from causing another overexposure; if no cause is determined, then the individual concerned will be monitored on a monthly basis until the RCC is satisfied that another overexposure is not likely to occur.

INVESTIGATIONAL LEVELS (mrem)	LEVEL I - ALARA (qtr)	LEVEL II - ALARA (qtr)	OTSG (qtr)	OTSG (monthly)
Whole Body	200	400	1250	400

(b) Dosimetry Records. The RPO will be designated in writing as the personnel dosimetry custodian. [AR 40-14, 6-1]

(1) DD Form 1952. The DD Form 1952 documents previous exposure history; required training provided to radiation occupational workers; and the type of dosimetry provided to the occupationally-exposed individual. [AR 40-14, 6-2]. In addition, the RPO should enter, date, and initial the following statement in the remarks section: "Individual has received instruction on potential hazards associated with use of or potential exposure to radiation from ---

----------. The potential risk associated with exposure is such that dosimetry/bioassay* is/is not* required." (*Line out incorrect response). The individual will then initial the statement as well [AR 40-14, B-2 (b) (6)].

(2) Automated Dosimetry Record (ADR). The RPO will review the *consolidated* report of exposure histories for all individuals on the dosimetry program each quarter. The RPO will sign each *individual* **fourth** quarter exposure history report and retain them permanently in the files. [DA PAM 40-18, 4-3(b)(3)]

(c) Notification of Exposures.

(1) Prior Exposures. *[20.2104c3: Determination of Prior Occupational Dose]* The RPO will request a record of prior exposure history from each civilian employer identified by the individual on DD Form 1952. If after 6 months from the date of the written request to the civilian employer no reply is received, the RPO shall assume for the purposes of administrative controls for the current year that the allowable dose limit for the individual is reduced by 1.25 rems for each quarter for which records were unavailable and the individual was engaged in activities that could have resulted in occupational radiation exposure. The DD Form 1952 (in the "Do Not Write In This Space" area) will be annotated with the date of each request.[AR 40-14, B-2 (b)].

(2) Concurrent Exposures. *[20.2106: Recording of Individual Monitoring Results]* Any military or civilian occupationally exposed individual will provide copies of off-duty or concurrent radiation exposure dose records to the RPO. The RPO will forward the records of these doses to AIRDC for inclusion into the individual's lifetime dosimetry records. [DA PAM 40-18, 3-4(g)]

(3) Annual Notification. *[19.13: Notifications & Reports to Individuals]* The RPO shall provide each individual who required monitoring with a written, annual report of their occupational dose. This report shall include:

(a) the name of the activity at which the individual was provided personnel dosimetry.

(b) the name and social security number of the individual.

(c) the individual's exposure information.

(d) and the following statement: "This report is furnished to you under the provisions of the Nuclear Regulatory Commission regulation 10 CFR 19 or Department of Labor regulation (29 CFR 1910). You should preserve this report for further reference." [10 CFR 19; AR 40-14, 6-6(a)]. The RPO will meet this requirement by attaching to a letter containing the statement above in paragraph (4) a copy of the NRC Form 5 sent by AIRDC each year. This letter will also contain the address and phone number for the Army Ionizing Radiation Dosimetry Center so that individuals can contact the dosimetry center for more information. The RPO will sign and date each copy of the NRC Form 5.

(4) Termination Notification. The RPO will attempt to collect forwarding or permanent addresses for each individual who is designated as an occupational worker. When that individual leaves the Department of Physics, the RPO will provide a written dose report within 30 days of when the dose for the final wearing period is determined. The report will contain the following statement: "This report is furnished to you under the provisions of the Nuclear Regulatory Commission regulation (10 CFR 19) or Department of Labor regulation (29 CFR 1910). You should preserve this report for further reference". [DA PAM 40-18,4-6]. Attached to the report will be the individual's complete exposure history while working in the Department of Physics in the form of the individual ADR or NRC Form 5, signed and dated by the RPO. The RPO will also provide the address and phone number for the Army Ionizing Radiation Dosimetry Center so that individuals can contact the dosimetry center for more information.

(d) Pregnant Women. The RPO must inform females occupationally exposed to ionizing radiation of the different exposure limits during pregnancy. A formal declaration of pregnancy, however, is the prerogative of each pregnant female and the RPO must not in any way intimidate or coerce a pregnant woman occupationally exposed to ionizing radiation to declare her pregnancy. The lower exposure limits do **not** apply until the woman has declared her pregnancy in writing. Such a written declaration shall be made on an SF 600 (Health Record - Chronological Record of Medical Care) and placed in the woman's health record. The woman shall complete, date, and sign the following SF 600 entry and provide a copy to the RPO [DA PAM 40-18,2-2c(4)(b)].

"I hereby make notification that I am occupationally exposed to radiation in the course of my normal job duties, and that I am now pregnant. My estimated date of conception is (date). I understand that by declaring my pregnancy, my occupational exposure to ionizing radiation will be controlled as prescribed in DA PAM 40-18/DLAI 1000.3."

The RPO must provide instructions (and a copy of the appendix to the proprosed revision 3 to NRC Regulatory Guide 8.13) regarding the prenatal exposure risks and concerns to the developing embryo or fetus to females occupationally exposed to radiation. As soon as an occupationally exposed female declares her pregnancy in writing to the RPO, the RPO must provide **monthly** dosimetry throughout the duration of the pregnancy. [DA PAM 40-18, 2-2(c)

ANNEX F: RADIATION SAFETY PROGRAM

1. **Appendix 1: Radiation Control Committee (RCC).** Membership by name will be designated by a Department of Physics memorandum and will consist of, as a minimum, the Head of the Department (Chairman), a permanent associate professor, the radiation protection officer (Recorder), the assistant radiation protection officer, the Budget and Operations Officer, all authorized users, the linear accelerator operator, a representative from the Department of Chemistry Radiation Protection Program, and the Safety Officer. The RCC will:

(a) Meet at the call of the Chairman but at least once a year.

(b) Oversee operation of the radiation protection program.

(c) Review proposals for the use of ionizing radiation sources.

2. **Appendix 2: Radiation Protection Officer (RPO).** The RPO and an assistant RPO will be designated by a Department of Physics memorandum. The principle duties of the RPO are listed below; a list of the recurring duties of the RPO are contained within the annual program review document.

(a) Advise Department of Physics personnel on matters pertaining to ionizing radiation protection.

(b) Post and maintain notices required by 10 CFR, Parts 19 and 21.

(c) Operate the Department of Physics personnel dosimetry system, maintain dosimetry badge storage areas in vicinity of radiation locations, and maintain personnel dosimetry records in accordance with AR 40-14 and DA PAM 40-18.

(d) Arrange for the procurement of radioactive material as required and insure that NRC-license and DA-radiation- authorization activity limits are not exceeded.

(e) Arrange for the disposal of radioactive material as necessary and in accordance with AR 385-11.

(f) Submit applications for changes to and renewals of NRC licenses and DA radiation authorizations as necessary.

(g) Provide training required by 10 CFR 19, 10 CFR 20, and 29 CFR 1910.96. Provide counseling IAW NRC Regulatory Guide 8.13 to radiation workers who become pregant.

(h) Maintain a library of radiation protection references which includes current copies of all of the references named in ANNEX F to this section of the SOP. (Current copies of 10 CFR and 29 CFR are maintained in the USMA Library on microfiche.)

(i) Maintain accountability of all Department of Physics ionizing radiation sources.

(j) Maintain radiation protection files in accordance with AR 25-400-2.

(k) Conduct a program review of the radiation safety program at least annually, and jointly with an incoming RPO, whenever possible.

3. **Appendix 3: Leak Tests.**

a. General Guidelines. [*10 CFR 35.59: Requirements for possession of sealed sources and brachytherapy sources*] Leak tests are required for sealed sources containing more than 100 microcuries of beta-gamma emitting material, except tritium, or more than 10 microcuries of alpha-emitting material. Leak tests are not required if the radioactive material has a half-life shorter than 30 days or is a gas. Leak tests are not required for sources placed in storage by the RPO, but such sources will be leak tested immediately upon removal from storage, as necessary.

(1) Leak tests, when required, will be performed at six-month intervals, except that sources specifically designed to emit alpha radiation will be tested at three-month intervals.

(2) If a source requiring leak testing is supplied with a certificate from the vendor indicating that a leak test has been done within six months (three months for specifically designed alpha-emitting sources), the source need not be retested until six months (three months for alpha-emitting sources) after the date of the last test and may be issued for immediate use.

(3) If no documentary evidence is available to show that a given source has been leak tested within six months (three months for alpha-emitting sources), the source will not be issued until it has been leak tested and the results evaluated.

(4) The minimum detectable activity for each leak counting and analysis procedures test will be less than 0.003 microcurie.

(5) Sealed sources will be considered contaminated if a leak test removes 0.005 microcurie or more of radioactive material, except for radium sources. For radium sources, leakage of radon gas in excess of 0.001 microcurie in 24 hours is considered excessive (the Department of Physics currently possesses no radium sources which require leak testing).

(6) All sealed sources found to be excessively contaminated will be immediately withdrawn from use by the RPO, who will determine whether or not the source is leaking. If it is leaking, it will be resealed or disposed. The RPO will also prepare any required reports (see AR 385-11 and 10 CFR 21).

b. Evaluation of Counting System Performance. [NCRP Report #58, p.226]

(1) Electronic Adjustment. Ensure that the detector-scaler system is properly adjusted in accordance with the operator's manual.

(2) Background Determination. Background (B) is defined as the count observed when measuring a "blank" that simulates, as closely as possible in chemical composition and physical form, the sample being measured [NCRP, p. 249].

(a) Select a blank wipe sample and position it relative to the detector so that the geometry (distance and orientation) can be readily reproduced with other samples.

(b) Assay (count) the blank sample. The time of background counting or the counting interval (T) should be the same as that used for counting samples.

(c) Record background count (B) and time interval (T).

(3) Decision Limit. Determine the counting limit (C_L), the net number of counts (total minus background) for reaching a decision that activity has been detected, where

$$C_L = 2.32\sqrt{B}.$$

NOTE: For this value, the probability of false detection (claiming there is a signal where there is none) is approximately 5%. [NCRP, p. 309].

(4) Counting Efficiency. A determination and calibration of the system's ability to detect known quantities of radioactive materials should be performed.

(a) Select a check source with a spectrum or emission similar to the isotope of interest in the source being leak- tested. The source activity should be less than 100 nanocuries and be certified by the supplier.

(b) Assay (count) the check source using the same geometry between the source and detector as that used in the background determination step above.

(c) Determine a calibration factor (k), such that:

$\kappa = A_c / \{(C_c - B) / T\}$, where

A_c = Activity of calibration source	[nCi]
C_c = Calibration source count by scaler	[counts]
B = Background counts	[counts]
T = Counting interval	[min]

c. Wipe Sample Assay.

(1) Prepare a separate wipe sample for each source. Be sure to number or label the samples for identification.

(2) Assay (count) the wipe sample using the same time interval and geometry between sample and detector as that used in the calibration step above.

(a) Record the observed sample count (C_s).

(b) If the net sample count ($C_s - B$) is less than the counting limit (C_L), then the activity on the wipe sample is recorded as less than the activity at the decision limit (A_L):

$A_L = k \cdot C_L$ [nCi]

(3) If the net sample count is greater than the counting limit (C_L), calculate and record the estimated activity in nanocuries on the wipe sample.

$A_s = \kappa [(C_s - B)/T]$

A_s = Activity of sample wipe	[nCi]
κ = Calibration factor for detector	[nCi/cpm]
C_s = Sample wipe count by scaler	[counts]
B = Background counts	[counts]
T = Counting interval	[min]

d. Response Action. If the wipe sample activity is 5.0 nanocuries or greater, withdraw the source from use, monitor for other contamination spread and notify appropriate authorities.

4. **Appendix 4: General Instructions for Safe Use of Radioactive Sources.** Only the RPO, alternate RPO or an authorized user will handle the Compton, Mossbauer, and PuBe experimental sources. Only the RPO, alternate RPO, or an authorized user may issue sealed sources to instructors. The issue of radioactive sources from the radioactive materials vault, or the transfer of the PuBe sources from the neutron howitzer will be documented. Sealed sources less than 10 μCi may be handled directly. Unsealed sources less than 10 μCi may be handled if careful to avoid touching the radioactive material. Use tongs or other devices for sealed or unsealed sources greater than 10 μCi. Never handle directly. Specific radiation protection instructions about the use of the larger radioactive sources and ionizing radiation sources are in Annex I.

5. **Appendix 5: Ordering and Receiving.** *[20.1906: Procedures for Receiving and Opening Packages]* The RPO will approve any request for radioactive material to ensure that the material does not exceed NRC license limits. The RPO will be notified as soon as possible of the receipt of a labeled radioactive material package.

6. **Appendix 6: Opening Packages.** Special requirements will be followed for packages containing quantities of radioactive material in excess of the type A quantity limits as specified in 10 CFR 20.1906 or for packages which are crushed, wet, or damaged. These quantity limits can be found in Appendix A of 10 CFR 71. The RPO or an authorized user will conduct the inspection and opening of all incoming radioactive material packages.

a. All Packages. For all packages, the following procedures for opening packages will be carried out:

(1) Put on disposable gloves to prevent hand contamination.

(2) Visually inspect package for any sign of damage (for example, wetness, crushing). If damage is noted, the package must be surveyed in accordance with paragraph (b) below.

(3) Measure the exposure rate at 3 feet from the package surface and record. If the exposure rate is greater than 10 milliroentgens per hour, stop procedure and perform the notifications required by 10 CFR 20.1906, as appropriate.

(4) Measure the package surface exposure rate and record. If the exposure rate is greater than 200 milliroentgens per hour, stop procedure and perform the notifications required by 10 CFR 20.1906, as appropriate.

(5) Open the package with the following precautionary steps:

(a) Open the outer package (following manufacturer's directions, ifsupplied) and remove packing slip.

(b) Open inner package and verify that contents agree with those on the packing slip. Compare requisition, packing slip, and labels.

(c) Check integrity of final source container (that is, inspect for breakage of seals, loss of liquid, and discoloration of packaging material).

(d) Check that the shipment does not exceed possession limits.

(6) Document receipt of package and results of inspection. The documentation will contain, as a minimum, the date, name of person performing the survey, quantity and type of radioactive material, purchase order number of the item, condition of package, radiation units of the label, and measured radiation levels.

b. Packages Exceeding Type A Quantity Limits. Surveys shall be performed on all incoming packages not exempt from the provisions of 10 CFR 20.1906 within 3 hours of the package's arrival. Written records of such surveys shall be maintained by the RPO and will contain, as a minimum, the date, name of person performing the survey, quantity and type of radioactive material, purchase order number of the item, condition of package, radiation units of

the label, measured radiation levels, wipe test results, survey results of packing materials, and disposition of package after inspection. In addition to the steps described in paragraph (1) above, the person inspecting the package will do the following:

(1) Wipe the external surface of the final source container and remove the wipe to a low background area. Assay the wipe and record the amount of removable activity. If the removable activity is in excess of 0.01 microcurie per 100 square centimeters the RPO will perform notifications required by 10 CFR 20.1906, as appropriate.

(2) Monitor the packing material, disposable gloves, and packages for contamination, as appropriate, before discarding.

(a) Treat any contaminated material as radioactive waste.

(b) If the packing material is not contaminated, obliterate radiation labels before discarding in regular trash.

7. **Appendix 7: Area Survey Procedures.** *[Subpart F: Survey and Monitoring; 20.1501: General]* Room B17 of Bartlett Hall and any other area where significant amounts of radioactive material are used or stored will be surveyed monthly by the RPO. This survey will consist of a measurement of radiation levels with a survey meter sufficiently sensitive to detect an exposure rate of 0.1 milliroentgen per hour. A record will be kept of all survey results, including negative results. The record will include:

a. Location of the survey, date of the survey, and identification of equipment used, including the serial number, calibration date, and calibration expiration date.

b. Name of the person doing the survey.

c. Drawing of the area surveyed, identifying relevant features such as active storage areas of radioactive material.

d. Measured exposure rates, keyed to location on the drawing (point out rates that require corrective action).

e. Corrective action taken in the case of excessive exposure rates, reduced exposure rates after corrective action, and any appropriate comments.

8. **Appendix 8: Neutron Monitoring.** The area around the subcritical assembly will be continuously monitored by neutron monitoring instruments. In addition, the responsiveness of the neutron monitors will be checked during leak test procedures.

ANNEX G: WASTE MANAGEMENT

Any radioactive material to be disposed of will be sent back to the original manufacturer (after coordination) or disposed of in accordance with AR 385-11 "Ionizing Radiation Protection" in coordination with Army Chemical and Armament Munitions Command. The Army routinely lets a contract for the consolidation and disposal of all Army radioactive wastes at an approved site. Point of contact is: Army Industrial Operations Command, ATTN: AMSIO-DMW, Rock Island Arsenal, IL 61299-6000; dsn 793-0338 or (309) 782-0338. *[Subpart K: Waste Disposal; 20.2001: General Requirements]*

ANNEX H: REFERENCES

1. AR 25-400-2, The Modern Army Recordkeeping System (MARKS).

2. AR 40-5, Preventive Medicine, 15 Oct. 90.

3. AR 40-14, Occupational Ionizing Radiation Personnel Dosimetry, 30 Jun 95.

4. AR 385-11, Ionizing Radiation Protection, 1 May 1980.

5. TM 3-261, Handling and Disposal of Unwanted Radioactive Material.

6. TB 43-180, Calibration Requirements for the Maintenance of Army Material.

7. USMA Supplement 1 to AR 385-12, Safety Program, 14 Feb 92.

8. Code of Federal Regulations (CFR), Title 10, Energy, "Chapter 1 - Nuclear Regulatory Commission."

   a. Part 19, Notices, Instructions and Reports to Workers; Inspections and Investigations.

   b. Part 20, Standards for Protection Against Radiation.

   c. Part 21, Reporting of Defects and Noncompliance.

   d. Part 30, Rules of General Applicability to Domestic Licensing of Byproduct Material.

   e. Part 31, General Domestic Licenses for Byproduct Material.

   f. Part 40, Domestic Licensing of Source Material.

9. Code of Federal Regulations, Title 29, Labor; Part 1910.

10. National Bureau of Standards Handbook 107 (American National Standard N43.1), Radiological Safety in the Design and Operation of Particle Accelerators, 1978.

11. US Nuclear Regulatory Commission (NRC) Regulatory Guides.

   a. Number 8.13, Instruction Concerning Prenatal Radiation Exposure.

   b. Number 8.29, Instruction Concerning Risks from Occupational Radiation Exposure.

   c. Number 10.2, Guidance to Academic Institutions Applying for Specific Byproduct Material Licenses of Limited Scope.

12. National Council on Radiation Protection and Measurements (NCRP) Reports.

a. Number 32, Radiation Protection in Educational Institutions.

b. Number 38, Protection Against Neutron Radiation.

c. Number 51, Radiation Protection Design Guidelines for 0.1-100 MeV Particle Accelerator Facilities.

d. Number 58, A Handbook of Radioactivity Measurements Procedures.

e. Number 72, Radiation Protection and Measurement for Low Voltage Neutron Generators.

f. Number 91, Recommendations on Limits for Exposure to Ionizing Radiation.

ANNEX I:

Radiation protection instructions for use of the larger radioactive sources and the van de Graaf accelerator.

1. **Appendix 1: The van de Graaf Accelerator.**

a. Authorization to use. Personnel who operate and maintain the linear accelerator will be designated on orders by the head of the Department of Physics.

b. Posting. An international standard radiation area warning sign will be displayed on the linear accelerator door.

c. Safety Briefing. Personnel will receive a detailed briefing on the requirements of this SOP during their initial orientation to this equipment. This briefing will be in addition to the radiation safety briefing that they will receive in accordance with 10 CFR 19.

d. Dosimetry. The operators and any personnel working with the linear accelerator will wear personnel dosimeters.

e. Source Handling. Sealed check sources should be handled by the edge of the disk and any prolonged close contact with the body should be avoided (i.e., they should not be placed in pockets). If the sources are lost or damaged in any way, however slight, report it to your advisors immediately.

f. Safety Procedures.

1. Operators will maintain a log book of operational parameters and maintenance.

2. The accelerator will not be used to accelerate deuterium or tritium gas.

3. Only operators designated on orders will be present in the target room when the accelerator is operating, and they will remain on the target chamber side of the room.

4. The interlock system is checked as part of the operating procedures for the system. Anytime the interlock system is bypassed, the reason for the bypass will be logged in the operator's log book.

5. The (SF6) gas used to insulate the accelerator tank from the high voltage terminal is a suffocating gas; if a leak is detected the area should be evacuated immediately.

6. Do not touch the base of the diffusion pumps; they are hot (over 350°F).

g. Serious Incidents. Notify the RPO immediately of any unusual event involving ionizing radiation and the accelerator. It cannot be emphasized enough that COMMON SENSE MUST BE USED IN THE OPERATION AND USE OF THE ACCELERATOR.

2. **Appendix 2: Subcritical Facility and Neutron Howitzer**

a. Authorization to use. Only the RPO or an authorized user will operate the subcritical assembly and use the plutonium-beryllium sources.

b. Source security.

(1) None of the natural uranium fuel slugs or PuBe sources will be removed from Bartlett Hall room B17 without the knowledge and approval of the RPO.

(2) The outside door to room B17 will be locked when no one is present. When the neutron sources are outside of the neutron howitzer, both the outside door and the barred door will be locked when no one is present. Entry to room B17 will be controlled by the RPO and the authorized users; one of these individuals will provide necessary access to the room.

(3) The plutonium-beryllium sources will be stored in the neutron howitzer when the subcritical assembly is not being used. The keys to the howitzer will be stored in the radioactive materials safe.

c. Posting.

(1) Whenever the subcritical assembly is operational, a single red and yellow warning rope will be placed across the entrance to the partitioned subcritical assembly area approximately five feet above the floor. This rope will have an international radiation warning sign hanging from it.

(2) An international radioactive materials warning sign will be placed on the inside of the entrance to BH17.

d. Shielding. No carbon or heavy water will used in any fashion in the assembly. The authorized users will insure that an adequate water level is maintained in the subcritical assembly at all times.

e. Safety Briefing. Personnel will receive a detailed briefing on the requirements of this SOP during their initial orientation to the equipment. This briefing will be in addition to the radiation safety briefing that they will receive in accordance with 10 CFR 19.

f. Dosimetry. All personnel entering the cordoned-off subcritical assembly area of room B17 while the subcritical assembly is operational, to include during start-up and shut-down procedures, will wear their beta-gamma\neutron dosimeters.

g. Radiation Exposure Monitoring.

(1) The neutron detector must be turned on prior to the removal of any source from the neutron howitzer. The warning levels should be set to 2 mrem/hr (100 cpm) and 10 mrem/hr (500cpm) [Neutron REM detector, Model NRD-1 Technical Manuel]. The paraffin detector ball should be placed on the table between the subcritical assembly and the adjacent wall approximately one meter from the edge of the subcritical assembly and one meter above the floor. The detector should be checked for proper operation by moving a source near the detector during loading. The subcritical assembly will not be loaded if the detector is non-operational.

(2) When the subcritical assembly is operational, the radiation levels immediately outside the subcritical assembly vessel must be measured upon entering room B17. A calibrated detector (either a Victoreen 450 or an Eberline 140) will be available for this measurement. If the radiation level within one foot of the subcritical assembly exceeds 2.0 mrem/hr (100 cpm) the room must be vacated immediately and the RPO notified .

h. Source Handling. The neutron sources will be handled by the RPO or authorized users. They will be moved using the threaded rods provided for that purpose and deposited into one of the red capped (hollow) fuel rods. The threaded rod will remain attached to the source while in the fuel rod so that it may be safely handled during removal. Neutron sources will be kept at least an arms length from the body and will never be touched or otherwise allowed in close proximity to any part of the body. In addition, no single person will handle/transfer the PuBe sources more than three times within any given quarter. Every effort will be made to minimize exposure time to the plutonium-beryllium neutron sources. In short, all exposure must be kept as low as reasonably achievable.

i. Serious Incidents. Should any of the sources be damaged, the measured radiation rates exceed stated limits, or if there is any reason to believe that a person was abnormally exposed, the RPO will be contacted immediately.

3. Appendix 3: Compton Effect Experiment (Cs-137)

a. Authorization to use. Only the RPO or an authorized user will remove this source from storage. The source will be immediately placed in the Compton Experiment collimator; the collimater will then be secured with a padlock and the RPO or an authorized user will retain the key.

b. Source security. The source will never be left unattended when it is not in the special (locked) collimator of the Compton experiment or in the radioactive materials safe. The door to the room will be locked when no one is present. During the experiment, the collimator will remain locked and its integrity will not be violated. When data acquisition is completed, the instructor will arrange the return of the source to the RPO. Note that no cadets are involved in the delivery or return of the source.

c. Posting. The door to the room in which the source is being used or stored will be posted with an international radioactive materials sign. The container holding the source will be similarly labeled with the isotope and activity.

d. Shielding. The instructor will ensure that shielding is installed around the Compton experiment apparatus. This shielding will intercept the primary gamma beam and will be set up to minimize exposure to scattered radiation. In the immediate area of the apparatus a perimeter of lead bricks will be used to reduce the experimenters' exposure to radiation (Figure 1). The most important part of this perimeter is along the axis of the primary beam. The instructor must approve the construction of the perimeter before the source can be exposed for the first time The beam port will be blocked with at least 5 cm of lead, except when counting data is being acquired.

e. Safety Briefing. Personnel will receive a detailed briefing on the requirements of this SOP during the initial orientation to the experiment. This briefing will be in addition to the radiation safety briefing that they will receive in accordance with 10 CFR 19.

f. Dosimetry. After the cesium source has been installed in the Compton experimental apparatus, a personal dosimeter will be worn by any person entering BH100C. Upon leaving the laboratory, the dosimeter will be immediately returned to the badge control rack.

g. Radiation Exposure Monitoring. A calibrated Geiger counter will be immediately available whenever the source is outside the safe. The Geiger counter will be used to monitor radiation levels and to verify the presence and location of the source and the adequacy of shielding. The instructor will insure that surveys of the experiment area are done before, during and after the experiment using a calibrated survey meter to demonstrate that exposure rates are at levels as low as reasonably achievable. Maximum acceptable exposure rate values are shown in Figure 2. The RPO will be notified if the measured exposure rates exceed these maximum values.

h. Source Handling. This source will never be touched by hand and will only be handled with tongs when it is outside of its storage container. The source will be transported between rooms only while inside its shielded container within the shielded rolling pig.

i. Safety Procedures.

(1) Unless personally supervised by an instructor, at least two cadets will be present in the laboratory when working on this experiment.

(2) Ensure that the beam port is covered except when actually collecting counting data. When the beam port is open, you will never place any part of your body within the lead perimeter surrounding the apparatus.

(3) The laboratory can be left unattended while counting is in process, i.e., the beam port is not blocked. If that is done, the following must be accomplished.

a. Ensure the lead shielding is in place in accordance with paragraph d above.

b. Place a sign stating "SOURCE EXFOSED" near the source's container, oriented so that it can be read from the doorway (Figure 3).

c. When leaving the laboratory, ensure that the door is locked.

d. Return the dosimeter to the dosimeter storage location.

(j) Serious Incidents. If the container/collimator is damaged, measured exposure rates exceed maximum acceptable values, or there is any reason to expect abnormal exposure to the source, immediately contact the faculty advisor and the RPO.

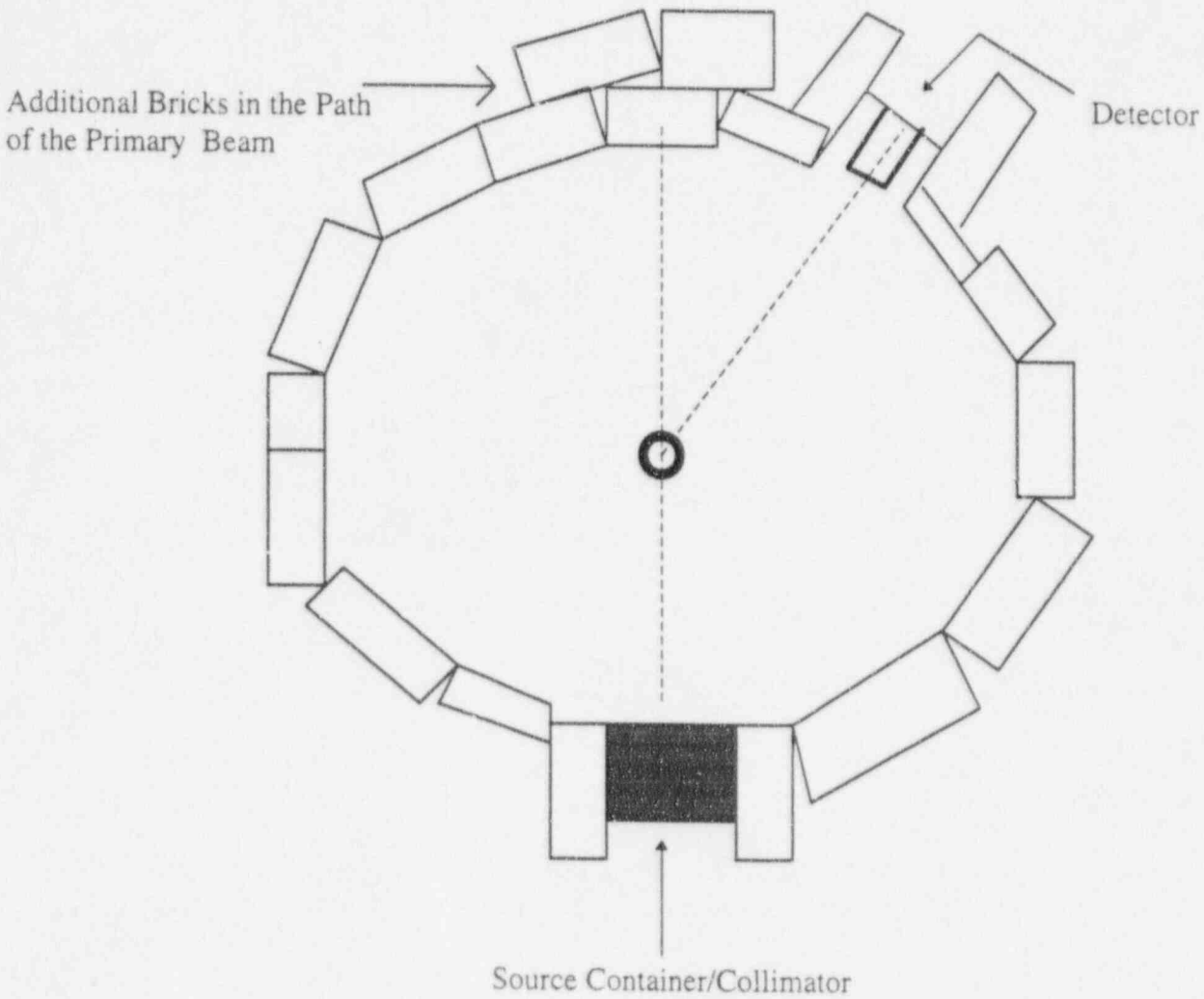


Figure 1. Typical Arrangement of Lead Bricks for Shielding

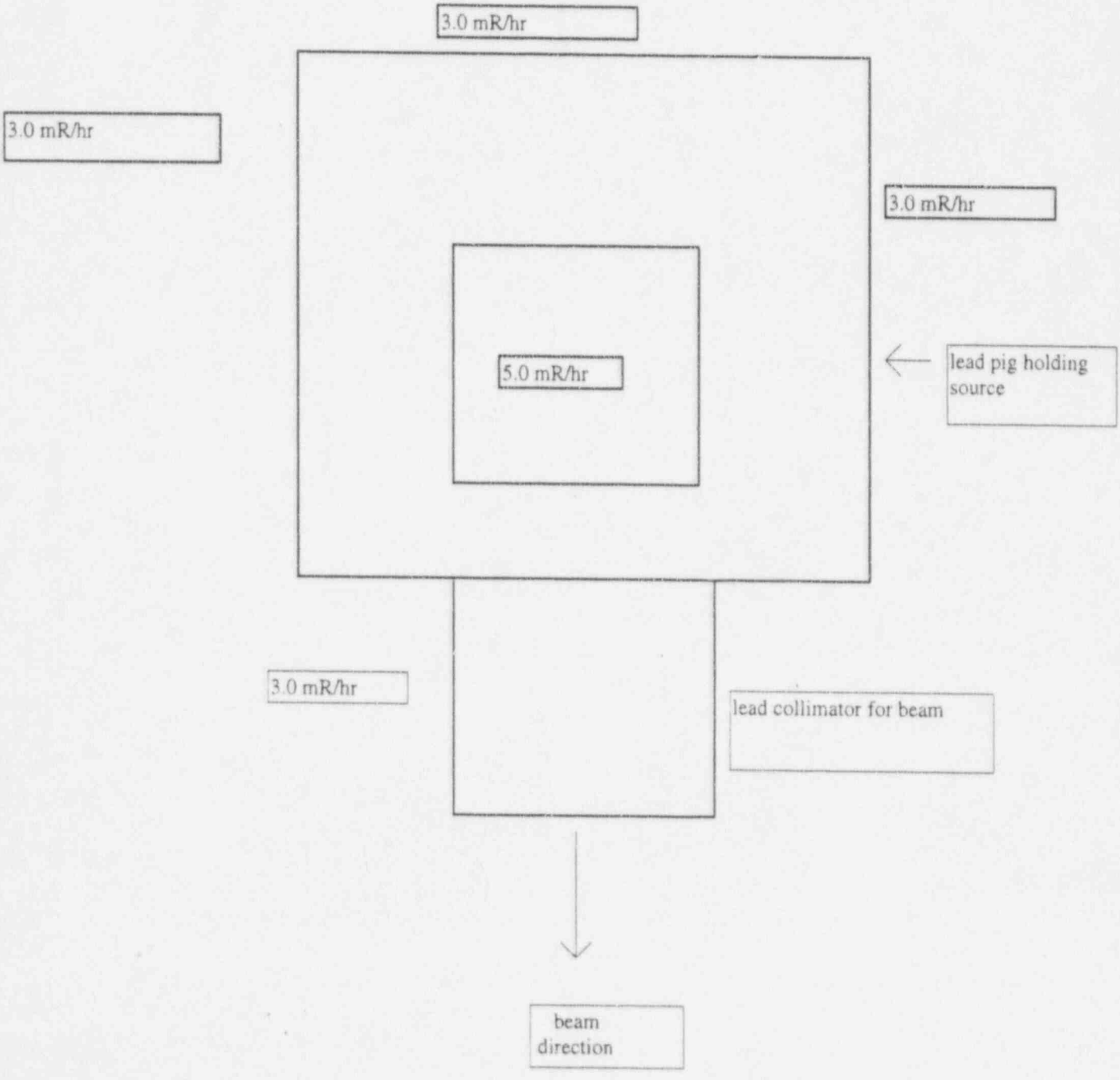

3.0 mR/hr
3.0 mR/hr
3.0 mR/hr
5.0 mR/hr
lead pig holding source
3.0 mR/hr
lead collimator for beam
beam direction

Figure 2. Radiation Survey (Max Values)

DO NOT DISTURB

SOURCE EXPOSED

EXPERIMENT IN PROGRESS

FIGURE 3. Sign to be posted near the source when it is exposed and unattended

3. **Appendix 4: Mossbauer Experiment (Co-57)**

a. Authorization to use. Only the RPO or an authorized user will remove this source from storage. The source will be immediately installed in the Mossbauer apparatus.

b. Source security. The source will never be left unattended when it is not mounted in the Mossbauer apparatus or in the radioactive materials safe. The door to the room will be locked when no one is present. When data acquisition is completed, the instructor will arrange the return of the source to the RPO. Note that no cadets are involved in the delivery or return of the source.

c. Posting. The door to the room in which the source is being used or stored will be posted with an international radioactive materials sign. The container holding the source will be similarly labeled with the isotope and activity.

d. Shielding. Shielding will be arranged around the apparatus to keep radiation exposure as low as reasonably achievable (See Figure 4).

e. Safety Briefing. Personnel will receive a detailed briefing on the requirements of this SOP during their initial orientation to the experiment. This briefing will be in addition to the radiation safety briefing that they will receive in accordance with 10 CFR 19.

f. Dosimetry. After the cobalt source has been installed in BH100C, a personal dosimeter will be worn by any person entering the laboratory. Upon leaving the laboratory, the dosimeter will be immediately returned to the badge control rack.

g. Radiation Exposure Monitoring. A calibrated Geiger counter will be immediately available whenever the source is outside the safe. The Geiger counter will be used to monitor radiation levels and to verify the presence and location of the source and the adequacy of shielding. The instructor will ensure that surveys of the experiment area are done before, during and after the experiment using a calibrated survey meter to demonstrate that exposure rates are at levels as low as reasonably achievable. If a dose rate (corrected for energy response) exceeding

2.0 mR/hr is measured, the room will be evacuated at once and secured, and the faculty advisor and RPO will be contacted.

h. Source Handling. These sources will never be touched by hand (except during installation) and will only be handled with tongs or tweezers by the instructor when it is outside of its storage container. During source installation, the source mount may be held by hand, being careful to keep the fingers on the back side of the holder. The ^{57}Co source is annealed in a metal substrate, which is permanently mounted in an aluminum source holder. The source holder screws onto the velocity driver motor. The faculty advisor will install the source in its proper position.

i. Safety Procedures.

(1) Unless personally supervised by the principal investigator, at least two cadets must be present in the laboratory when working on the experiment.

(2) When the cobalt source is mounted on the velocity driver, a sign stating "source exposed" (Figure 3) will be placed on top of the experimental apparatus.

(3) When leaving the laboratory, ensure that the door is locked.

(4) Return the dosimeter to the dosimeter storage location.

j. Serious Incidents. If the velocity driver is damaged or there is any reason to expect abnormal exposure to the source, immediately contact the faculty advisor or the RPO.

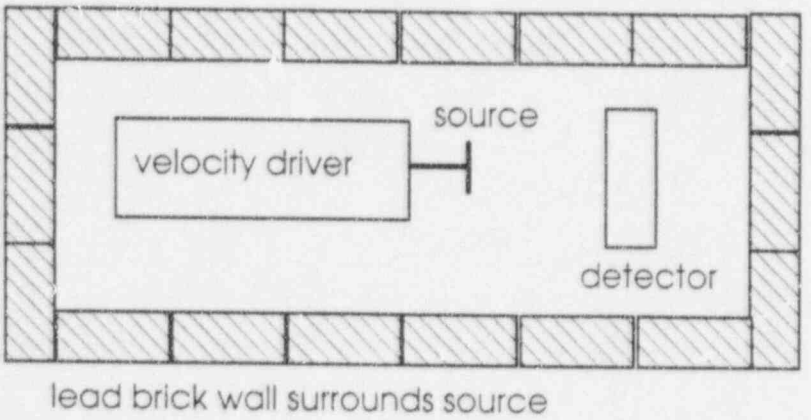


Figure 4. Arrangement of lead bricks for shielding and location of ^{57}Co source.

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03620
STATUS CODE: 0
FEE CATEGORY: EX 3P 1D
EXP. DATE: 20010731
FEE COMMENTS: 170.11(A)(4) V
DECOM FIN ASSUR REQD: N

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: ARMY, DEPARTMENT OF THE
RECEIVED DATE: 960821
DOCKET NO: 3000897
CONTROL NO.: 123588
LICENSE NO.: 31-02102-02
ACTION TYPE: AMENDMENT

2. FEE ATTACHED
AMOUNT: ---------
CHECK NO.: ---------

3. COMMENTS

SIGNED M. A. Perkins
DATE 8/26/96

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /__/)

1. FEE CATEGORY AND AMOUNT: ----------

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT ----------
RENEWAL ----------
LICENSE ----------

3. OTHER ----------

SIGNED ----------
DATE ----------