DEPARTMENT OF THE ARMY
OFFICE OF THE SURGEON GENERAL
WASHINGTON, D.C. 20310

REPLY TO
ATTENTION OF

DASG-PSP

27 MAY 1980

US Nuclear Regulatory Commission
Division of Fuel Cycle & Material Safety
Materials Licensing Branch
Washington, DC 20555

Gentlemen:

Reference your letter of 14 March 1980, Control Number 99837.

Two copies of the response from Silas B. Hayes Army Hospital, Fort Ord, are inclosed. Recommend approval.

Sincerely,

ROBERT T. WANGEMANN
COL, MSC
Radiological Hygiene Consultant

1 Incl
as (in dupe)

1112

HSPA-P (20 Mar 80) 3d Ind
SUBJECT: Renewal of USNRC License No 04-12727-02, Silas B. Hays Army Hospital, Fort Ord, CA

DA, HQ, US Army Health Services Command, Ft Sam Houston, TX 78234

15 MAY 1980

TO: HQDA (DASG-PSP-E) WASH DC 20310

1. Subject information for US Nuclear Regulatory Commission (NRC) license, for human use, is forwarded for appropriate action in accordance with the provisions of AR 40-37, 7 January 1977.

2. A review of the information provided indicates that it has been properly prepared and adequately meets NRC requirements.

3. Recommend approval of this request. USA MEDDAC, Ft Ord has the necessary physical facilities, trained personnel and an established a radiation protection program to adequately support the proposed uses.

FOR THE COMMANDER:

SIGNED

13 Incl
as

W. C. COSGROVE
LTC, AGC
Asst AG

CF:
Cdr, USAEHA, ATTN: HSE-RH
Cdr, USA MEDDAC, ATTN: AFZW-MD-PM, Ft Ord/wo incl

AFZW-MD-PM (20 Mar 80) 2d Ind [redacted]
SUBJECT: Renewal of USNRC License No. 04-12727-02, Silas B. Hays Army Hospital, Fort Ord, CA

DA, HQ, US Army Medical Department Activity (MEDDAC) Fort Ord, Fort Ord, California 93941 16 APR 1980

THRU: Commander, US Army Health Services Command, ATTN: HSPA-P, Fort Sam Houston, TX 78234

TO: DA, HQ, ATTN: DASG-PSP-E, Washington, D. C. 20310

1. This letter is submitted in response to the NRC letter (Control No. 99837) dated 14 March 1980.

2. The basic letter makes reference to specific portions of the application which was submitted for renewal of USNRC License No. 04-12727-02, Silas B. Hays Army Hospital, Fort Ord, CA. Sections of the Application referenced in the basic letter were modified to provide clarity for further consideration for USNRC License renewal. Modified sections of the application are inclosed in the order described in the basic.

3. As requested, the following clarification is submitted specific to each question:

a. In view of comments 1 and 2 of the basic letter from the NRC, the present Radiation Protection Officer, does not meet training requirements specified in Appendix A, Items 1a and 1b (Reg Guide 10.8). Another qualified individual's credentials is presented for consideration as radiation protection officer. The license application has been amended accordingly.

b. The Form NRC-313M-Supplements A and B of the presently assigned Chief of Nuclear Medicine Service is presented for approval as radiation protection officer (Incl 1). This individual is certified by the American Board of Nuclear Medicine (Incl 2).

c. The dose calibrator is calibrated according to procedures in accordance with Appendix D (January 1979) in Reg Guide 10.8. The reference standard nuclides in use, their activity and calibration accuracy are as follows: Barium-133 (254 microcuries) $\pm$ 5.6%; Cesium-137 (207.2 microcuries) $\pm$ 3.8%; Cobalt-57 (930 millicuries) $\pm$ 3.2%.

d. Provided as inclosure 3 is a detailed diagram of the storage facility for the Tc-99m generator. The generator is surrounded by lead bricks (2" x 4" x 8") on all sides. There is an additional 1/2 inch of sheeting on the bottom of the generator.

e. Paragraph 6, Item No. 13 has been modified to clarify generator storage procedures (Incl 4). It should be noted that paragraph 6 of this document refers to other sections of the license which are subsequently referenced in paragraphs n and o, below.

f. The duties and responsibilities of the Radiation Protection Committee has been modified to include an annual audit of the entire radiation program in accordance with NRC regulations. This change is reflected in modified Item No. 7 of the license (Incl 5).

g. Written instructions for individuals receiving radioactive shipments have been revised IAW Appendix E Reg Guide 10.8 (Incl 6).

h. Reference Item Nos. 6 and 7 of the basic NRC letter, safe opening procedures for all packages containing licensed materials have been established in accordance with Appendix F (Reg Guide 10.8). The modified procedures outlined in Item No. 14 of the license are also provided in Inclosure 6.

i. Item No. 12, paragraph 6a of the license has been modified as requested (Incl 7). This is to confirm that ancillary personnel presently receive initial and familiarization training annually thereafter. As outlined in Item No. 12, the training is provided by the Chief of Nuclear Medicine Service in the form of lectures and other presentations.

j. As requested, Item No. 15 of the license application has been modified to include requirement for protective clothing (e.g., gloves and laboratory coats). Refer to Inclosure 8.

k. Paragraph 7b, Item No. 17, of the license application has been modified to clarify responsibility for performing weekly wipe tests (Incl 9).

l. Item No. 19 of the application has been modified to include requirements of Appendix K (Reg Guide 10.8). Refer to Inclosure 10.

m. Liquid Iodine-131 is no longer being used. Sodium iodide capsules are being used instead of liquid Iodine-131. If liquid Iodine-131 is used, personnel will be required to open vials in the fume hood and instructed to wear gloves. Bioassay will be conducted on personnel handling therapeutic liquid Iodine-131. As a minimum thyroid uptake counts will be performed approximately twenty-four (24) hours after exposure. Although precautionary measures for handling therapeutic liquid Iodine-131 are provided, it is not anticipated that I-131 will be used in the future.

AFZW-MD-PM (20 Mar 80) 2d Ind 16 APR 1980
SUBJECT: Renewal of USNRC License No. 04-1272-02, Silas B. Hays Army Hospital, Fort Ord, CA

n. Reference compliance with 10 CFR 20.303, the following information is submitted:

(1) The sewage released from the hospital is 46,000 gallons per day.

(2) NRC maximum allowed for I-125 is 4×10^{-5} uCi/ml.

(3) Maximum amount of I-125 that may be released by this hospital per day is 7,070 uCi.

(4) RIA kits have a maximum of 25 uCi. Only 1 kit per day is used so the amount of I-125 released is well within the limits.

(5) Logs have been established to provide a record of amounts and types of radionuclides released into the sanitary sewer system.

o. Prior to disposal of radioactive waste that has decayed to background levels, radiation labels are removed as stated in paragraph 7b, modified Item No. 18 (Incl 10).

p. Clarification of procedures for handling all radioactive waste, including long-lived waste are provided at paragraph 7d, Item No. 18 of the license (Incl 10).

q. Paragraph 7d of Item No. 18 of the license has been modified to include statutory requirements (49 CFR and 10 CFR 20) which are observed in the disposition of radioactive waste. Army Regulation 755-15 entitled "Disposal of Unwanted Radioactive Waste" establishes requirements for administrative, budgetary and intra-agency coordination activities within the Department of the Army. AR 755-15 is provided as Inclosure 11. Paragraph 3c and 11 of AR 755-15 are relevant to the subject license application. This modification is submitted to the NRC for further clarity and consideration. It should be noted that the storage facility described in paragraph 7d, Item No. 18 is under the control of both the radiation protection officer of the licensed facility (USNRC License No. 04-12727-02) and the Fort Ord radiation protection officer who manages the Fort Ord radioactive material disposal facility in accordance with AR 755-15, 10 CFR 20, and 49 CFR. The Fort Ord radiation protection officer has been approved by the Silas B. Hays Radiation Protection Committee as a user of licensed materials in order to provide assistance to the hospital RPO with managing waste materials. This individual's curriculum vitae is submitted as Inclosure 12.

AFZW-MD-PM (20 Mar 80) 2d Ind 16 APR 1980
SUBJECT: Renewal of USNRC License No. 04-1272-02, Silas B. Hays Army Hospital, Fort Ord, CA

r. The XENON-133 protocol, Item No. 21 of the license was modified to reflect that linear air flow volume determinations will be performed quarterly to monitor the ventilation syste (Incl 13).

s. The following information is provided with reference to the information concerning the charcoal trap for XENON-133 studies: Manufacturer-Atomic Products Corporation; Model-Pulmonex XENON system; catalog number 13-500.

SIGNED

wd all incl
Added 13 incl
as

LAWRENCE C. BLAIR
COL, MC
Commanding

rec'd 1 Apr 80

S: 14 April 1980

HSPA-P (20 Mar 80) 1st Ind
SUBJECT: Renewal of USNRC License No. 04-12727-02, Silas B. Hayes Army Hospital, Ft Ord, CA

DA, HQ, US Army Health Services Command, Fort Sam Houston, Texas 78234

27 MAR 1980

TO: Commander, USA MEDDAC, Fort Ord, ATTN: PVNTMED/CPT Moore

1. Forwarded herewith is a request from the US Nuclear Regulatory Commission (NRC) for additional information to permit the NRC to continue review of your NRC license renewal.

2. Further guidance will be provided your organization per FONECON between COL Pitchford, this headquarters and CPT Moore, your MEDDAC, on 21 March 1980.

3. Request reply to NRC be forwarded thru channels to arrive at this headquarters, ATTN: HSPA-P, NLT 14 April 1980.

FOR THE COMMANDER:

W. C. COSGROVE
LTC, AGC
Asst AG

1 Incl
nc

DEPARTMENT OF THE ARMY
OFFICE OF THE SURGEON GENERAL
WASHINGTON, D.C. 20310

REPLY TO ATTENTION OF

DASG-PSP-E

20 March 1980

SUBJECT: Renewal of USNRC License No. 04-12727-02, Silas B. Hayes Army Hospital, Ft Ord, CA

THRU: Commander
US Army Health Services Command
ATTN: HSPA-P
Ft Sam Houston, TX 78234

TO: Commander
Silas B. Hayes Army Hospital
Ft Ord, CA 93941

1. A request from the US Nuclear Regulatory Commission for additional information is attached.

2. Per discussion between COL Wangemann of this office and COL Pitchford of HSC, further guidance will be provided concerning response to question number 2.

3. Request your reply be forwarded to reach this office in three copies not later than 18 April 1980.

FOR THE SURGEON GENERAL:

C Stebbing, Col, MC

TARAS NOWOSIWSKY, M.D.
Colonel, MC
Chief, Preventive Medicine
Consultants Division

1 Incl
as

FORM NRC-313M-SUPPLEMENT A
9-78)

U.S. NUCLEAR REGULATORY COMMISSION

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE
MOHAMMED IZHAR	California

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	University of Tennessee Center ~~for~~ the Health Sciences Department of Nuclear Medicine Memphis, Tennessee 38163	130	120
b. RADIATION PROTECTION	"	40	30
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	"	25	20
d. RADIATION BIOLOGY	"	15	0
e. RADIOPHARMACEUTICAL CHEMISTRY	"	60	30

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
^{99m}Tc	20 mCi	UTCHS, Memphis, Tn	7/1/76-7/31/77	Clin. Nuc.Med.
^{131}I	30 mCi	"	"	"
^{125}I	1 mCi	"	"	"
^{75}Se	250 uCi	"	"	"
^{169}Yb	1 uCi	"	"	"
^{133}Xe	20 mCi	"	"	"
^{32}P	10 uCi/kg	"	"	"
^{57}Co	0.5 uCi	"	"	"
^{59}Fe	20 uCi	"	"	"

Sec C 1

ITEM NO. 8
Date: 24 March 1979

FORM NRC-313M-SUPPLEMENT B
(8-78)

U.S. NUCLEAR REGULATORY COMMISSION

PRECEPTOR STATEMENT

Supplement B must be completed by the applicant physician's preceptor. If more than one preceptor is necessary to document experience, obtain a separate statement from each.

1. APPLICANT PHYSICIAN'S NAME AND ADDRESS

FULL NAME
Mohammed Izhar, M.D.

STREET ADDRESS
Silas B. Hays Army Hospital
P.O. Box 353

CITY | STATE | ZIP CODE
Fort Ord | CA | 93941

KEY TO COLUMN C

PERSONAL PARTICIPATION SHOULD CONSIST OF:

1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage.

2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.

3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS *(Additional information or comments may be submitted in duplicate on separate sheets.)* D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION	131	
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME	24	
	LIVER FUNCTION STUDIES	6	
	FAT ABSORPTION STUDIES	-	
	KIDNEY FUNCTION STUDIES	-	
	IN VITRO STUDIES	2208	
OTHER			
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING	30	
P-32	EYE TUMOR LOCALIZATION	26	
Se-75	PANCREAS IMAGING	5	
Yb-169	CISTERNOGRAPHY	8	
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES	456	
OTHER			
Tc-99m	BRAIN IMAGING	1414	
	CARDIAC IMAGING		
	THYROID IMAGING	152	
	SALIVARY GLAND IMAGING	3	
Tc-99m	BLOOD POOL IMAGING	26	
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING	772	
	LUNG IMAGING	67	
	BONE IMAGING	641	
OTHER	Renal Function Studies	55	

PRECEPTOR STATEMENT *(Continued)*

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN *(Continued)*

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS *(Additional information or comments may be submitted in duplicate on separate sheets.)* D
P-32 *(Soluble)*	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES	4	
P-32 *(Colloidal)*	INTRACAVITARY TREATMENT	2	
I-131	TREATMENT OF THYROID CARCINOMA		
	TREATMENT OF HYPERTHYROIDISM	23	
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
Co-60 or Cs-137	TELETHERAPY TREATMENT		
Sr-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR	26	
Sn-113/ In-113m	GENERATOR	0	
Tc-99m	REAGENT KITS	54	
er			

3. DATES AND TOTAL NUMBER OF HOURS RECEIVED IN CLINICAL RADIOISOTOPE TRAINING

July 1, 1976 - July 31, 1977 -- 2080 hours

4. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF:

a. NAME OF SUPERVISOR
Martha McDonald, M.D.

b. NAME OF INSTITUTION
University of Tennessee

c. MAILING ADDRESS
865 Jefferson, Room 150C

d. CITY
Memphis,

TERIALS LICENSE NUMBER(S)
R-7919-Lr

5. PRECEPTOR'S SIGNATURE
Martha McDonald M.D

7. PRECEPTOR'S NAME *(Please type or print)*
Martha McDonald, M.D.

8. DATE
March 6, 1979

FORM NRC-313M-SUPPLEMENT 8
(8-78)

The American Board of Nuclear Medicine

1142

A CONJOINT BOARD OF THE AMERICAN BOARDS OF INTERNAL MEDICINE ... BY THE SOCIETY OF NUCLEAR MEDICINE

475 Park Avenue South, New York, New York, 10016
Administrative Office

December 21, 1979

Mohamed Izhar, M.D.
42 Montsalas Drive
Monterey, CA 93940

Dear Dr. Izhar:

With great pleasure the Conjoint American Board of Nuclear Medicine informs you that you have passed its September 8, 1979 Certifying Examination in the Broad field of Nuclear Medicine and now are recognized as a Certified Specialist with competence in all aspects of the diagnostic, therapeutic, and medical research uses of radioactive materials.

A certificate indicating this recognition will be sent to you in the near future.

The Conjoint American Board of Nuclear Medicine congratulates you upon your achievement and this recognition.

Sincerely yours,

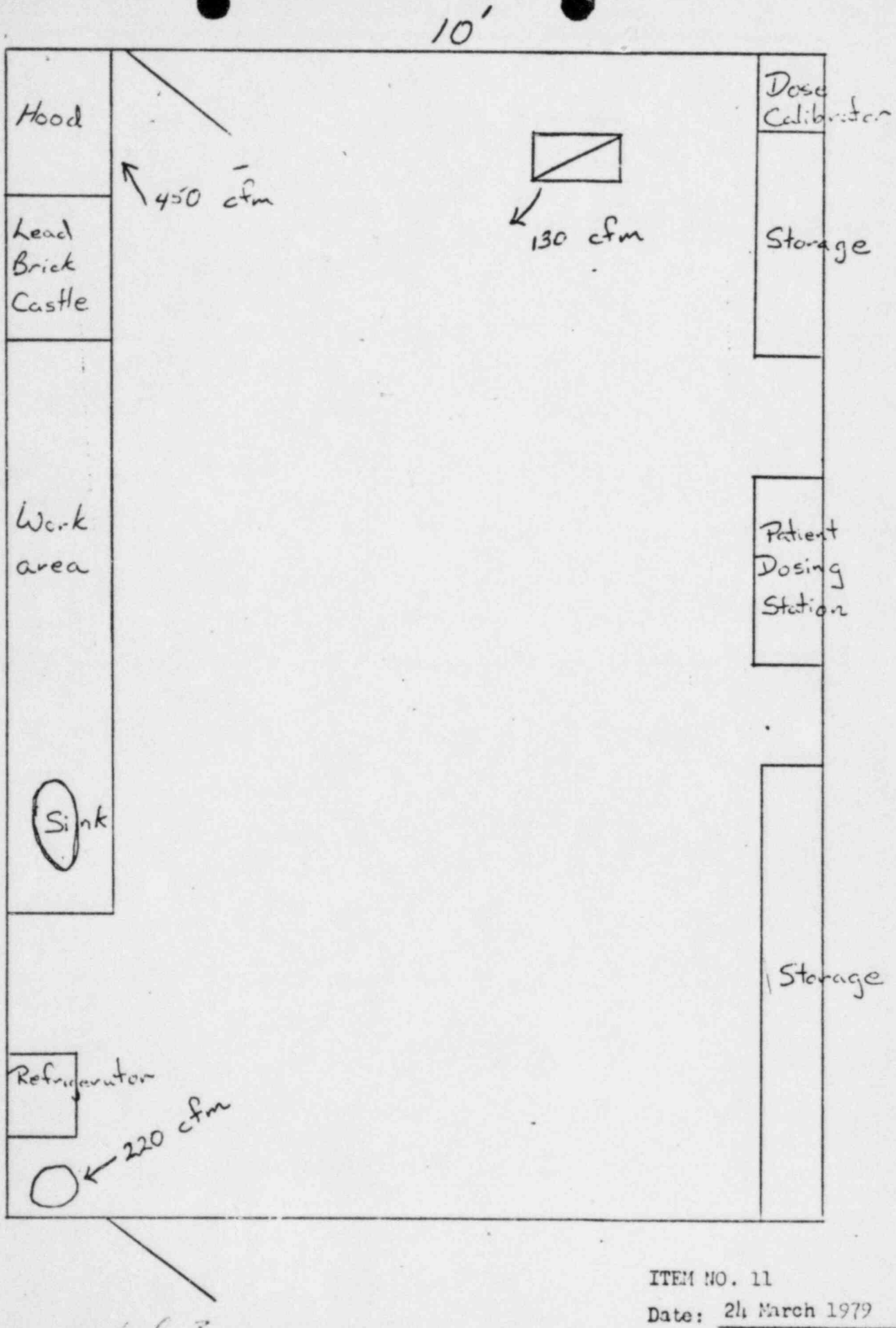
F. J. Bonte

Frederick J. Bonte, M.D.
Chairman

FJB/cat

4

Hot Lab



ITEM NO. 11

Date: 24 March 1979

h. Doses of radiopharmaceuticals drawn into a plastic disposable syringe will be administered within 15 minutes from time of drawing from stock vial. Doses remaining in syringe for more than 15 minutes will be properly discarded and a new dose drawn. Macroaggregates suspensions will be drawn immediately prior to administration.

i. Other quality control measures recommended by the manufacturer of the kits and/or generators.

5. The elution of the Mo99/Tc99m generator is performed rapidly and automatically, requiring the presence of the technologist in close proximity to the generator only during initiation of elution and removal of the eluted vial. The elution vial will be placed in a special protective shield throughout subsequent handling. Elution and subsequent handling of the eluate will be performed only by an experienced Nuclear Medicine technologist/physician.

6. Spent generators will be stored in the Decay/Disposal area. After at least seven half-lifes of Mo99, the spent generators will be disposed of according to appropriate U.S. Army and NRC regulations (10 CFR 20.301) to qualified transporters to an approved land burial site. Specific procedures for handling and disposal of used generators is outlined in paragraph 7d, Item No. 18, this license application.

7. The radiopharmaceutical preparation area will be located on the laboratory work area beside the generator castle. It consists of an area of approximately 20 X 30 inches enclosed on all sides by lead bricks two inches thick.

Inclosure 4

ITEM NO. 13

Date: 24 March 1979

l. Insure that the use of radioactive materials are in consonance with sound clinical and experimental procedures.

m. Conduct an annual audit of the Radiation Safety Program to determine that all activities are being conducted safely and in accordance with NRC regulations and the conditions of the license.

3. COMPOSITIONS: The committee shall include two groups: voting members and ex-officio members.

a. The voting members shall include:

Chief, Professional Services	COL R. S. Pakusch	Chairperson
DENTAC Commander	COL V. L. Milligan	Member
Deputy for Veterinary Activity	COL J. M. Lyday	Member
Chief, Department of Primary Care and Community Medicine	LTC L. J. Nevarez	Member
Chief, Department of Radiology	MAJ R. Lasiewski	Member
Chief, Department of Pathology	MAJ R. B. Hill	Member
Chief, Department of Medicine	COL H. D'Ambrosio	Member
Chief, Nuclear Medicine/ Radiation Protection Officer	MAJ M. Izhar	Member
Assistant Radiation Protection Officer	CPT R. D. Moore	Member
Secretary, Nuclear Medicine	Ms. C. Frock	Recorder w/o Vote

b. Ex-officio members shall include:

Chief, Logistics Division	LTC R. D. Roussin
Chief, Food Service Division	MAJ G. K. Liu
Chief, Department of Nursing	LTC J. Hoppe
Chief, Physiotherapy	LTC D. F. Layne
Chief, Ophthalmology	MAJ R. C. Husted
Chief, Dermatology	LTC J. A. McKillop
Chief, Urology	LTC P. H. Beck

The Curriculum Vitae for each member is attached.

4. MEETING FREQUENCY: At the discretion of the Chairperson, but not less than quarterly.

5. MINUTES:

a. Minutes of each meeting will be prepared and forwarded to the Commander for review and approval, and distributed IAW instructions contained in paragraph 6d of basic regulation.

b. The Recorder will forward the original document within five (5) working days of the meeting to the Chief of Nuclear Medicine for compliance with paragraph 4, AR 40-37.

ITEM NO. 7

DATE: 24 March 1979

4 of 5

PROCEDURE FOR EXAMINING INCOMING PACKAGES

1. In accordance with Section 20.205 of 10CFR20, all packages received which contain radioactive material shall have their external surfaces monitored for radioactive contamination due to possible leakage of their contents, except those packages which are exempt as stated in paragraphs i, ii, iii, and iv of Section 20.205 (b)(1).

a. The monitoring shall be performed as soon as possible, but no later than three hours during normal duty hours or eighteen hours if received after normal duty hours.

b. Each package requiring monitoring shall first be monitored using a beta-gamma survey meter and then wipe tested. If the wipe test reveals removable radioactive contamination in excess of 0.01 microcuries (22,000 dpm) per 100 square centimeters of external package surface, the following will be notified:

(1) SBHAH Radiation Protection Officer

(2) NRC Compliance Division in Walnut Creek, CA

(3) Carrier and Manufacturer

c. After negative wipe test results, the packages shall be carefully opened in the upright position as indicated on the package. Package material will be carefully removed and the container examined virtually for any signs of internal damage. If any evidence of damage or internal leakage is found, the container itself shall then be wipe tested while being handled with disposable rubber gloves. If internal contamination is found, the container shall be disposed of as radioactive waste, and will not be used in patient studies.

2. A log book shall be kept on all incoming packages of radioactive material and the results of wipe testing/monitoring shall be recorded.

3. If package is wet or appears to be damaged <u>immediately</u> contact the Radiation Protection Officer. Ask the carrier to remain at the hospital until it can be determined that neither he nor the delivery vehicle is contaminated.

Assistant
Radiation Protection Officer

CPT Moore or SP6 Bennett

Office # 2696 6881
Home # 449-8968 384-4753 .

ITEM NO. 14

Date: 24 March 1979

Incl 6

e. Measure surface exposure rate and record. If greater than 200 mR/hr, stop procedure and notify Radiation Protection Officer.

f. Observe outer package for leakage stains - record condition.

(1) If stains present, wipe 100 cm area with dry wipe and assay, record.

(2) If wipe has greater than .01 uCi (22,000 dpm), proceed with caution.

g. Open the outer package and remove packing slip. Open inner package to verify contents and integrity of final source container. Check also that shipment does not exceed possession limits.

h. Wipe external surface of final source container with moistened cotton swab or filter paper held with forceps, assay and record.

i. Monitor the packing material and packages for contamination before discarding.

(1) If contaminated, treat as radioactive waste.

(2) If not, obliterate radiation labels before discarding in regular trash.

4. REQUIRED TRAINING AND EXPERIENCE.

a. Users, co-workers for human use will have received clinical practical experience in the specific duties for which they are being trained.

b. Residents receive only familiarization instruction in the use of radioisotopes and are exempted from the provisions of the SOP. The training received does not qualify them for independent use of radioisotopes.

c. Technologists working with radioisotopes will have received the Technologist Course in Radioisotope Technique and Nuclear Medicine offered through the National Naval Medical School, Bethesda, Maryland, or equivalent training.

d. All personnel such as clerical, nursing, housekeeping and security will receive proper instruction of items in Section 19.12 of 10 CFR Part 19, from the Nuclear Medicine Service through in-service education. This will be done on an initial basis followed by annual familiarization.

5. QUALIFICATION AND CERTIFICATION.

a. Personnel may become qualified in the use of radioisotopes through constructive credit granted by the Radiation Protection Committee for previous training and experience.

b. In the case of physicians, evidence of satisfactory training or the clinical practical experience will be provided to the RPO by the user under whom the experience is obtained.

c. Records of training and experience of radioisotope workers will be maintained by the RPO or his designee.

d. In all cases, the Nuclear Regulatory Commission guidelines for Certification of individuals for use of radioisotopes will be followed.

6. CONTINUING EDUCATION.

a. Nuclear Medicine physicians and technologists will participate in a monthly in-service training program during which selected topics in instrumentation radiopharmacology, radiation physics, human anatomy and physiology, scanning techniques and radiation safety/health physics practices will be presented. Also see item 4d above which will be presented.

b. Nuclear Medicine physicians and technologists will be permitted to participate in annual meetings and/or courses which are directed toward "state of the art" instrumentation, safety practices, training and technique in Nuclear Medicine.

c. When practical, personnel are encouraged to participate in continuing educational courses offered through local or extension universities.

ITEM NO. 12

Date: 24 March 1979

Encl 7

GENERAL LABORATORY RULES FOR THE SAFE USE OF RADIOACTIVITY MATERIALS

1. Occupational exposure to ionizing radiation is that exposure incurred as a result of an individual's employment or duties which are in direct support of the use of radioactive materials or machinery capable or producing ionizing radiation. This does not include the purposeful exposure of individuals to sources of ionizing radiation for medical purposes.

2. Every effort shall be made to maintain radiation doses as far below the standard as practicable. Laboratory rules for the use of radioactive material are as follows:

a. Protective clothing (e.g. gloves, lab coats) will be worn at all times when handling radioactive materials.

b. Stock the laboratory with plastic or rubber gloves, warning tags and labels, wipes, appropriate survey/counting instruments, forms for necessary records, plastic bags and tape for waste disposal, absorbent paper, etc. The use of good procedures is greatly facilitated by having proper tools/supplies at hand.

c. Have available and use when appropriate, remote handling devices, automatic pipettes or dispensers, tongs, for the manipulation and transfer of radioactive preparations.

d. Designate and label a "hot sink" for radionuclide disposal and cleaning of contaminated glassware. Tagging of the sink drain to be surveyed is done before plumbing work. (Ref. 10 CFR 20 to ensure sewage concentration limits are not exceeded).

e. Storage area for radionuclides should be designated and labelled.

f. Measure and record the radiation levels (in mR/hr) in the work and storage area and adjacent non-controlled areas, with an appropriately calibrated detector.

g. Designate and label the radioactive work areas. Cover work surfaces with absorbent paper that has plastic backing to protect furniture and facilitate clean up. Use stainless steel or plastic trays to help confine liquids if spilled. Use disposable supplies wherever possible.

h. Wear personnel radiation monitors (TLD, film dosimeter, etc.) on body and hands while working.

ITEM NO. 15

Date: 24 March 1979

Incl 8

(3) An additional initial survey shall be made by the RPO of locations where radioactive sources will be used, stored, or disposed of before an operation is initiated.

(4) Procedures involving therapeutic administration of radioactive materials where the patient is required to be hospitalized shall be surveyed by the RPO to insure conformance with radiation safety procedures recommended in NCRP Report Number 37 or 40, whichever is appropriate.

7. Method of Survey: Routine surveys should be carried out in two parts to determine both radiation levels and removable contamination levels.

a. Radiation levels: Monitoring area with a radiation survey meter sufficiently sensitive to detect 0.1 mR/hr. The results of this survey should be recorded on a standard form which should show:

(1) Location, date, and type of equipment used.

(2) Identification of person conducting the survey.

(3) Drawing of area surveyed, identifying relevant features such as active storage areas, active waste areas, etc.

(4) Measured exposure rates, keyed to location on drawing.

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

b. Contamination levels: A series of wipe tests will be conducted weekly in all areas where activity is handled in unsealed form. The location of wipe tests should be indicated on the above mentioned survey form and should be chosen for maximum probability of contamination, e.g. areas where individual doses are drawn up, incoming packages received, frequent pipetting carried out. The action level for evaluating wipe test results is 100 dpm/cm^2.

(1) Floors, particularly adjacent to doorways, lead syringe shields, and door and drawer handles should be wipe tested frequently. Care should be taken that cross contamination does not occur.

(2) An end window GM or gas proportional counter normally may be used for assaying beta emitters at or above C-14.

(3) A gamma scintillation counter should be used for pure gamma emitters. Make sure that the analyzer threshold is set below the lowest gamma energy used.

(4) Record a background count of 5-10 minutes using the same counting conditions used with the wipes.

(5) In case of wipes contaminated with gamma emitters, the radionuclide can be identified from successive counts with different analyzer settings if the settings have been calibrated with known energy standards.

THERAPEUTIC USE OF RADIOPHARMACEUTICALS

1. PURPOSE. To familiarize the nursing staff with their responsibilities to the patient and themselves in the prevention of unnecessary exposure to ionizing radiation.

2. GENERAL.

a. This type of radioactive material is administered in liquid form and, therefore, classified as an unsealed source. The material will remain in the patient until it decays by radioactive half-life and/or is excreted, therefore, contamination of linen, etc., is possible.

b. Therapeutic quantities of radioactive materials will be administered by a physician specifically trained in Nuclear Medicine, and certified by the SBHAH Radiation Protection Committee to perform therapy to be administered.

c. The Chief, Nuclear Medicine Service and the RPO shall ensure that all patients treated with iodine-131 or gold-198 will be placed in a private room with a toilet. The room and toilet areas more likely to be contaminated will be covered with protective material as appropriate to the amounts of contamination to be expected. Particular attention should be given to objects likely to be touched by the patient, e.g., telephones, doorknobs, and other items that would be difficult to decontaminate.

d. The RPO shall monitor the patient area, provide anticontamination material, and provide radiation protection special instructions and materials to the patient and ward personnel. He shall notify ward personnel when the residual radioactive material in the patient's body is insufficiently low enough to permit the patient to be discharged.

e. Notify the RPO and the physician who administered the radioactive material if any of the following occur:

(1) Major surgery

(2) Transfer of the patient

(3) Death of the patient

3. SPECIFIC GUIDELINES FOR NURSING PERSONNEL

a. Pregnant nursing personnel will not be assigned the duties of caring for radiation therapy patients.

b. Consistent with adequate patient care, carry out only minimal nursing procedures close to the patient. If the patient's clinical status requires constant observation, rotate personnel required to perform adequate nursing care in order to minimize exposure to personnel. The patient's bed should be approached only when required by nursing duties.

ITEM NO. 19

Date: 24 March 1972

Att 10

c. WEAR your film badge when entering the area. DO NOT use the film badge of another employee. Film badges will be supplied by the RPO.

d. A television set, telephone, books, etc., may be provided the patient.

e. The food tray will be prepared entirely with disposable components. The tray will be disposed of as waste within the patient's room. Uneaten food will not be given to other patients or staff members.

f. The RPO will monitor the patient area and will indicate a "safe distance" line for visitors.

g. The patient may have visitors. Visitors should stay on the "safe" side of the line indicated on the floor.

h. Necessary contamination control measures are very similar to isolation techniques.

i. Cover the mattress and pillow on the bed with plastic or rubber material.

j. Wear gloves when changing bed linen, dressings, etc.

k. The patient must wear hospital pajamas.

l. Place a plastic-lined waste basket and linen hamper in the patient's room.

m. Place waste and excreta, soiled linen, etc., in the designated containers for monitoring and disposal by the RPO.

n. Personal items for patient care (thermometer, bedpan, etc) will be kept in the patient's room. Bath water may be disposed of in the commode.

o. Ambulatory patients will use the commode in their room only.

p. Diagnostic samples of blood, urine and feces should only be obtained when authorized by the radiotherapist.

q. Patient will only be discharged after approval by Chief, Nuclear Medicine Service and RPO. Instructions will be given to the patient and family concerning proper precautions to be taken.

r. Before a therapy patient's room is reassigned to another patient, the room will be surveyed for contamination and decontaminated if necessary, and all radioactive waste and waste containers will be removed.

ITEM NO. 19

Date: 24 March 1970

7. Radioactive waste disposal.

a. All radioactive waste shall be collected in containers which are conspicuously posted with the radiation caution symbol and the words, CAUTION RADIOACTIVE WASTE. These containers will be used exclusively for radioactive waste. A log shall be maintained to show the type and amount of radioactive materials until disposed of.

b. Clinical laboratories designated by the RPO shall maintain radioactive waste storage areas to allow short lived material to decay to background prior to disposal with normal trash after labels denoting radioactivity have been removed. The RPO will monitor this waste with a beta-gamma survey meter to assure that no detectable radioactivity remains.

c. Liquid waste may be disposed of through designated laboratory disposal sink in accordance with written instructions provided by the RPO to insure compliance with NRC Regulations.

d. Long-lived radioactive waste materials, and high activity waste shall be disposed of in accordance with the provisions of Army Regulation 755-15, 10 CFR 20.301 and appropriate requirements of 49 CFR. The following specific comments outline the waste handling system established in accordance with the above-listed regulations:

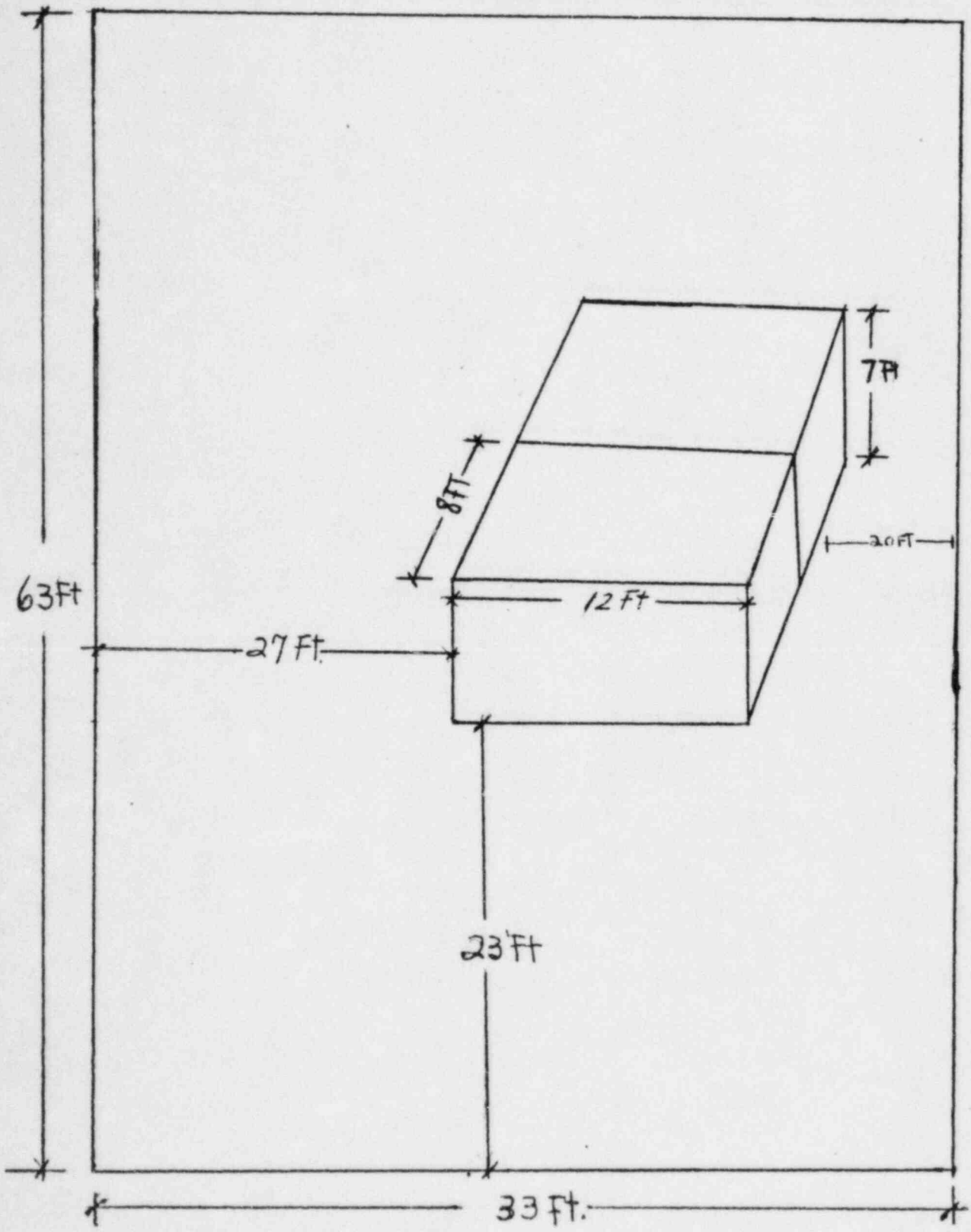
(1) Used TC-99m generators, long lived radioactive waste materials, high radioactive waste and other solid waste are transported to the radioactive waste storage facility which is described in the diagram and map on the following pages. The waste storage facility consists of two 8ft X 12 ft exportable containers secured by an 8 foot fence surrounding an area 63ft X 33ft. Both containers and the surrounding fence remain locked at all times. The appropriate radiation warning signs are posted on the door of each container and at the fence gate. All materials which are transferred to the facility will be packaged in DOT approved containers prior to transport.

(2) The storage facility described above is managed by the Fort Ord radiation protection officer. However, the facility is under the joint control of both the Fort Ord RPO and the RPO of the licensed facility (USNRC license No. 04-12727-02, Silas B. Hays Army Hospital). The Fort Ord RPO has been approved by the Radiation Protection Committee as a user of the licensed material and to act as an agent on behalf of the license.

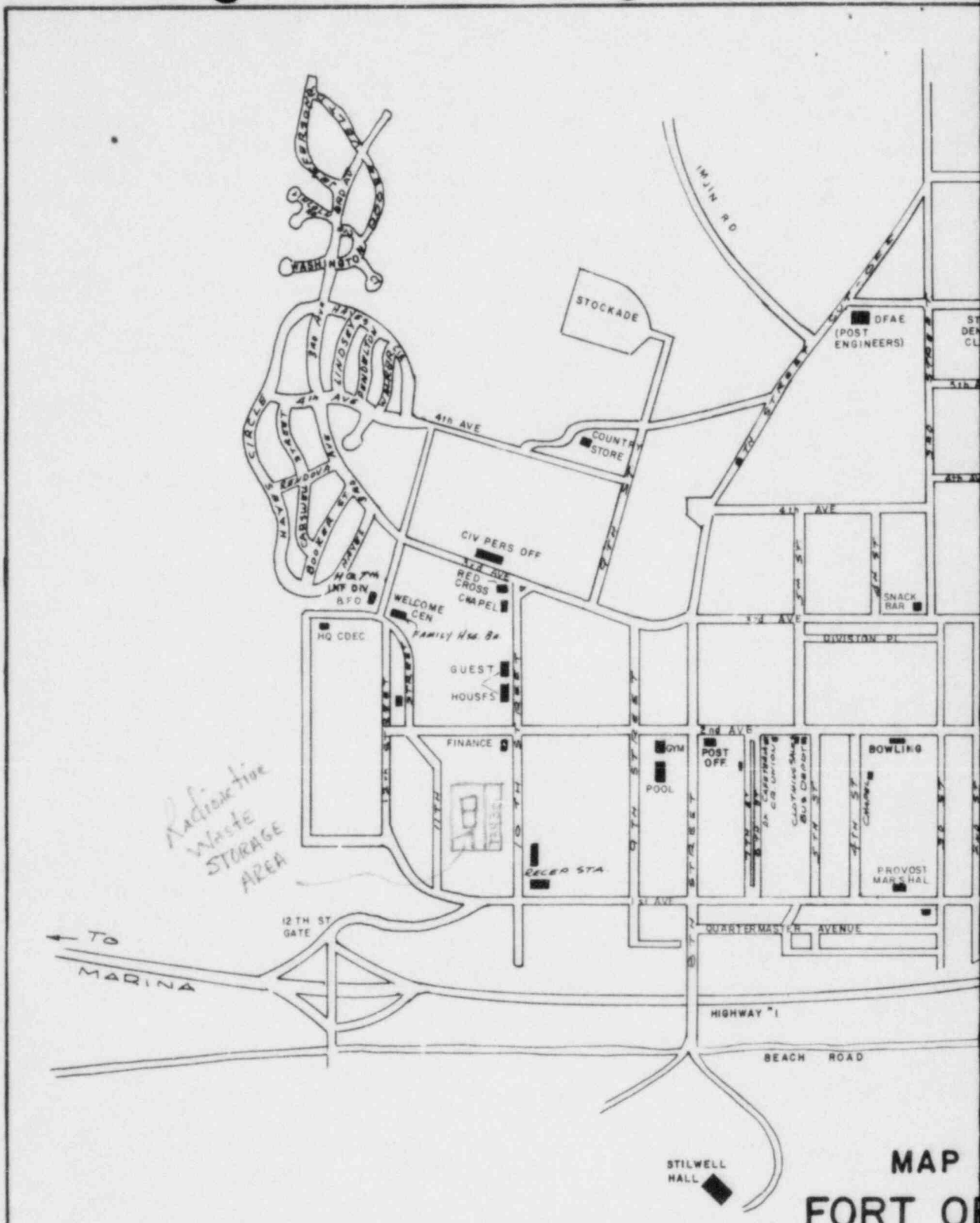
(3) Both the Silas B. Hays Army Hospital and the Fort Ord RPO's conduct joint inspections and surveys of the waste storage facility on a weekly basis. It is the sole responsibility of the Silas B. Hays Army Hospital Radiation Protection Officer to ensure that waste generated by the hospital Nuclear Medicine Service are managed in accordance with pertinent NRC and DOT regulations.

ITEM NO. 18

Date: 24 March 1979



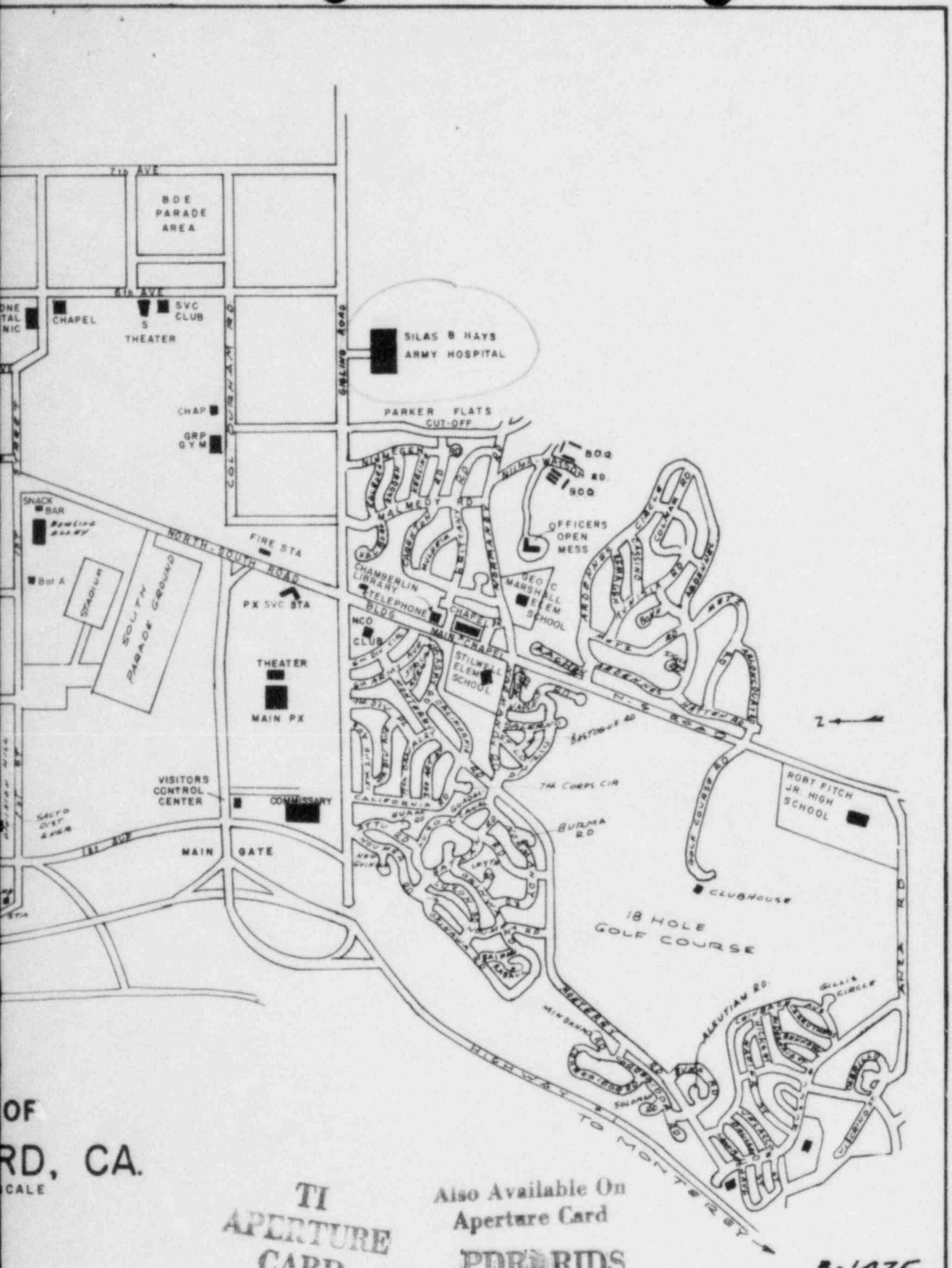
FENCES AROUND THE 2 CONTAINERS STORING RADIOACTIVE MATERIALS



MAP

FORT O

NOT TO



OF

RD, CA.

CALE

B-1475
JUL-75

8006190666-01

ARMY REGULATION
No. 755–15

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 4 November 1966

DISPOSAL OF SUPPLIES AND EQUIPMENT

DISPOSAL OF UNWANTED RADIOACTIVE MATERIAL

Section I. GENERAL

1. Purpose. This regulation establishes responsibility and provides policy and instructions for the storage shipment, and disposal of unwanted radioactive material.

2. Scope. This regulation has Army-wide application, but does not apply to combat areas.

3. Definitions. For the purpose of this regulation, the following definitions apply:

a. Accumulating organization. Any Army activity, other than radioactive material disposal facility, which generates, accumulates, and/or stores unwanted radioactive material.

b. Local storage. Storage of unwanted radioactive material, on temporary basis only, at places other than the Army radioactive material disposal facility.

c. Army radioactive material disposal facility. A facility which receives unwanted radioactive material from accumulating organizations and which also stores, concentrates, packages, marks, labels, ships, and effects the ultimate disposal of this material.

d. Radioactive material. Any material or combination of materials that spontaneously emit ionizing radiation.

(1) *Radioisotope.* Any isotope which is radioactive.

(2) *Byproduct material.* Any material, except special nuclear material, which has become radioactive by exposure to the radiation incident to or which is yielded during the process of producing or utilizing special nuclear material. Cobalt-60 and strontium-90 are examples of byproduct material.

*This regulation supersedes AR 755-380, 10 April 1962.

TAGO 7088—Oct. 250-408,—66

(3) *Special nuclear material.* Plutonium, uranium–233, uranium enriched with the isotopes 233 or 235, and any other material which the U.S. Atomic Energy Commission determines to be special nuclear material, or any material artificially enriched with any of the aforementioned.

(4) *Source material.* An material, except special nuclear matera which contains by weight one twentieth of one percent (0.05%) or more of uranium, or thorium, or any combination thereof.

(5) *S& material.* Collective term for both source and special nuclear material. Source and special material includes plutonium, thorium, uranium–233, uranium-235, and uranium–238. In addition, whenever deuterium, tritium, enriched lithium or compounds of these materials are employed in special weapons applications, they are considered to be source and special material and must be controlled and accounted for as such.

(*a*) *Collectible amounts of source and special material.* Tuballoy oxide oralloy, plutonium oxides or mixtures of oralloy and tuballoy oxides that can be separated from those materials with which they were picked up or collected.

(*b*) *Returnable amounts of source and special material.* Those amounts of source and special nuclear materials that are to be returned automatically to the nearest national stockpile site or operational storage site without specific authority of Commander, Field Command, Defense Atomic Support Agency (FC/DASA). The following amounts are considered minimum returnable quantities:

1. Any part made of tuballoy, oralloy, or plutonium which has not lost its identity even though it may be severely damaged.

2. Any piece of tuballoy, even though its identity as a part is no longer recognizable, which weighs 100 grams or more. This amount corresponds to a square of metal 1 inch on a side, approximately $\frac{5}{16}$ of an inch thick.

3. Any collectible amounts of tuballoy oxide in quantities of 1000 grams (a volume of approximately 42 cubic inches or 2.75 cupfuls) or more.

4. Any piece of oralloy or plutonium metal which weighs 1.0 gram or more, even though its identity as a part is no longer recognizable. This amount corresponds to a bit of metal $\frac{1}{4}$ inch by $\frac{1}{4}$ inch by $\frac{1}{16}$ inch (0.64 cm X 0.64 cm X 0.16 cm).

5. Any collectible amounts of oralloy or plutonium oxides or mixture of oralloy and tuballoy oxides, in quantities of 1 gram or more.

e. Disposal of radioactive material. The act of getting rid of unwanted radioactive material under proper authority. Disposal may be accomplished by removal from man's immediate habitat or by transfer, donation, or sale to persons authorized to receive it under AR 700–52.

f. Ultimate disposal. Ultimate disposal includes burial in the sea or land which removes the radioactive material from man's immediate habitat. It also includes incineration, release into sanitary sewerage systems, and dispersal into air or water under carefully controlled conditions. It does not include action taken to return source and special nuclear material to FC/DASA or the U.S. Atomic Energy Commission (AEC) for reprocessing.

g. Radioactive waste. Excess and surplus unwanted radioactive material and material contaminated with radioisotopes, including source and special waste as defined in *h* below, special weapons radioactive waste and radioactive waste associated with the production, possession, and use of radioactive material. Radioactive waste will include property which, while originally nonradioactive, has become contaminated to such an extent that it is economically unsound to decontaminate or the contamination cannot be reduced to an acceptable level for its intended use.

h. Source and special nucle waste. Source and special nuclear residues v ch cannot be economically separated from those materials which have been contaminated.

i. Radiation controlled area. Any area, access into which is controlled for the purposes of protection of personnel from exposure to radiation or to radioactive materials.

4. **Responsibilities.** *a. Commanding General, U.S. Army Materiel Command.* The Commanding General, U.S. Army Materiel Command, is responsible for—

(1) Formulating policies, procedures, and methods for disposal of unwanted radioactive materials.

(2) Establishing Army radioactive material disposal facilities in CONUS.

(3) Conducting research and development programs to provide improved methods, techniques, and hardware for the disposal of unwanted radioactive material.

(4) Designing and developing specifications for special containers for radioactive waste, and producing such containers when a requirement is established.

(5) Providing technical assistance with regard to special radiological disposal problems.

(6) Providing technical advice for the establishment and operation of Army radioactive material disposal facilities overseas.

(7) Providing qualified technical escort personnel to accompany shipments of unwanted radioactive material when requested.

(8) Conducting an annual command inspection of the Army radioactive material disposal facilities located within CONUS.

b. The Surgeon General. The Surgeon General is responsible for providing advice, guidance, and medical assistance on the health hazards associated with and resulting from the disposal of unwanted radioactive materials. Requests for medical advice and assistance will be forwarded through command channels to The Surgeon General, ATTN: MEDPS–PE, Department of the Army, Washington, D.C. 20315.

c. Director of Transportation, ODCSLOG.

(1) The Director of Transportation, ODCSLOG, is responsible for—

(*a*) Providing staff supervision and policy guidance for transportation, movement, and related safety during transport of radioactive and fissile materials other than weapons.

(*b*) Reviewing designs, specifications, and test reports of shipping containers for unwanted radioactive and fissile materials.

(*c*) Providing the means for securing special permits from applicable Federal regulatory agencies.

(2) The above applies to the safe movement of radioactive and fissile materials other than weapons by the Army, within CONUS, and between CONUS, Alaska, Hawaii, and U.S. territories.

d. Oversea commanders. Major oversea commanders are responsible for the following:

(1) The establishment of oversea radioactive material disposal facilities as required. (*Exception:* Commander, U.S. Army Forces, Southern Command.)

(2) Operation of the radioactive material disposal facility in strict accordance with policies, procedures, and methods established by the Commanding General, U.S. Army Materiel Command, and published in pertinent DA directives, including technical manuals. (*Exception:* Commander, U.S. Army Forces, Southern Command.)

(3) The establishment of qualified escort of unwanted radioactive material shipments within the oversea theater as may be required.

(4) Safe transportation of unwanted radioactive materials. In oversea areas, Army commanders will be guided by this regulation and AR 55–55, except where sovereign states have requirements which differ from those contained in this regulation. In such cases, Army commanders will observe the more restrictive requirements of either regulation.

(5) Preparation of administrative procedures consistent with this regulation.

(6) Conducting an annual command inspection of the Army radioactive material disposal facilities located within their respective commands.

e. Local commanders. Commanders of organizations, units, and activities which generate and/or accumulate disposable radioactive waste and materials will—

(1) Insure that, in the case of property which is contaminated with radioactive

material, all possible efforts are made to decontaminate the items before taking disposal action. In the event it is economically unsound to decontaminate the property or if the contamination cannot be reduced to a safe level, the contaminated property will be treated as radioactive waste. Decontamination procedures and techniques are contained in TM 3–220.

(2) Provide for the local storage, the preparation for shipment, and subsequent shipment of radioactive material to the appropriate radioactive material disposal facility.

(3) Maintain an SOP to cover these activities at all times. Additional guidance is furnished in TM 3–261.

f. The Inspector General. The Inspector General, Headquarters, Department of the Army will be responsible for conducting inspections of all radioactive material disposal facilities. The Inspector General will assume this responsibility on 1 July 1967.

5. Implementation. Commanding Generals of U.S. Army Materiel Command; U.S. Continental Army Command; U.S. Army Combat Developments Command; U.S. Army Air Defense Command; U.S. Army Security Agency; U.S. Army Strategic Communications Command; U.S. Army Intelligence Command; U.S. Army Forces, Strike Command, the major oversea commands, the heads of Department of the Army staff agencies, the Commander, Military Traffic Management and Terminal Service, and Superintendent, U.S. Army Military Academy will issue instructions implementing this regulation. As a minimum, the implementing instructions will designate channels for requests for radioactive materials disposal assistance.

6. Security. *a.* The security plan for disposal of unwanted radioactive material will be prepared by the command, activity, or project manager responsible for the material. The security plan for disposal will be incorporated into the technical literature for the item. The plan will provide the continuity of security protection for the radioactive material which is commensurate with the level of security classification involved, and will provide procedures for declassification.

b. Activities preparing to ship classified radioactive material will alert the consignee, in advance of shipment, of the security classification involved and the procedures for declassification after receipt.

c. Areas in CONUS in which unwanted radioactive material is stored, either temporarily pending shipment, in a consolidation storage area, or in an ultimate land disposal area, will be designated, posted, and protected as Restricted Areas, in accordance with AR 380–20. Physical safeguards which are appropriate to the degree of hazard or security classification involved will be employed, as described in AR 380–20. Commanders outside CONUS will use the provisions of AR 380–20 as guidance in the establishment of area protection and physical safeguards for radioactive material in storage.

7. Budgeting and funding. *a.* The disposal of unwanted radioactive material will be budgeted and reported under account 2200.2, in accordance with AR 37–1. Functions include handling, processing, packaging, escort service, transportation of unwanted radioactive material for shipment to radioactive disposal facilities. All costs for the above functions will be financed by the shipping installation or activity. Costs for ultimate disposal will be borne by the command operating the radioactive material disposal facility.

b. Oversea commanders are responsible for budgeting and funding for all costs incurred in processing, shipment, and ultimate disposal overseas or return to CONUS Army radioactive material disposal facilities, including technical escort but excluding ocean transportation costs which are initially financed by the Military Sea Transportation Service and which will be budgeted and funded by the ODCSLOG, Director of Transportation.

8. Support of equipment. Each commander responsible for the procurement and issue of items of equipment which contain radioactive materials will insure that the specifications and technical literature for the item contain information as to the quantity and type of radioactive material contained and procedures for safe handling, storing, and disposal of these items.

9. Special problems. Special radioactive material disposal problems requiring logistical assistance will be directed to the Commanding General, U.S. Army Materiel Command, ATTN: AMCMA–DA, Washington, D.C. 20315. Radioactive material disposal problems involving licensing regulations, decontamination, and/or radiological safety will be routed to Commanding General, U.S. Army Materiel Command, ATTN: AMCAD–S.

Section II. ACTION BY ORGANIZATIONS HAVING UNWANTED RADIOACTIVE MATERIAL

10. Holding action. Activities generating or accumulating radioactive material, including waste, will place such material in a secure local storage area pending shipment to a radioactive material disposal facility. It is more economical to process large quantities of radioactive material for ultimate disposal than to process small quantities. Therefore, installations which have radiological protection officers (AR 40–14) and which are able to store and safely consolidate radioactive material intended for ultimate disposal are encouraged to consolidate their waste before requesting shipping instructions. Additional guidance is furnished in TM 3–261.

11. Local storage. *a.* A radiation controlled area will be established to store accumulated radioactive material on a temporary basis. This area will be posted according to AR 385–30 to restrict entry and adequate security must be provided to prevent unauthorized access into and/or removal of the radioactive material. Until such time as the material is received by the radioactive material disposal facility, radiation safety associated with the material will be the responsibility of the Army element which was authorized to use the material under an AEC license or Department of the Army radioactive material authorization issued in accordance with AR 700–52.

b. Where practicable, material will be segregated as follows:

(1) Combustible.
  (*a*) Liquid.
  (*b*) Solid.
  (*c*) Gases.
(2) Noncombustible.
  (*a*) Liquid.
  (*b*) Solid.
  (*c*) Gases.

c. Materials will be stored in covered containers. Each container having radioactive materials stored therein will display a DA Label 15 (Caution: Radioactive Materials) and, if applicable, a radioactive waste container log. The following information, if unclassified, will be shown on DA Label 15 or on the log:

(1) Radiation symbol and words "Caution—Radioactive Material."
(2) Nomenclature, Federal stock number, and, where applicable, serial number.
(3) Physical description.
  (*a*) Solid, liquid, or gas.
  (*b*) Quantity (number, weight, volume, and, if gaseous, pressure at standard conditions).
(4) Chemical description.
  (*a*) Hazardous chemicals present.
  (*b*) For liquids, solvent present.
(5) Radiological description.
  (*a*) Radioisotopes.
  (*b*) Millicuries of activity per radioisotope and date measured or determined.
  (*c*) Maximum dose rates (mrad/hr) at the surface and at 1 meter from the surface of the storage container.

d. The local fire department will be kept currently advised as to location and types of stored radioactive material and procedures for fighting fires adjacent to or involving radioactive material.

12. Serviceable or economically repairable items. Accountable radioactive property (source sets, etc.) which is serviceable or economically repairable will be reported to the appropriate national inventory control point (NICP) for disposition instructions unless otherwise instructed in the technical literature pertaining to the item. The national inventory control point should take one of the following actions:

a. Direct that the property be transferred for further utilization to another Army installation or agency which is authorized to receive such material.

b. Request authority through command channels from the Deputy Chief of Staff for Logistics, PEMA Execution Division, to transfer this property to authorized agency outside the control of the Army. (After a policy has been established for a particular type of equipment, further coordination is unnecessary for transfers of items covered by such policy.) Upon receipt of Department of the Army approval, the transfer of the material can be accomplished.

c. Direct the possessor of the property to decontaminate it or to process it for ultimate disposal as radioactive waste in accordance with paragraph 15. Guidance on decontamination is contained in TM 3–220.

13. Waste from special weapons. Radioactive waste such as paper, clothing, and dust contaminated with source and special material will be

packaged and labeled in accordance with TM 39–20 6.

14. Returnable amounts of source and special nuclear material. Returnable amounts of source and special nuclear material from special weapons will be packaged, labeled and shipped in accordance with instructions in TM 39–N–11.

15. Disposition instructions for radioactive materials intended for ultimate disposal. *a.* Requests for disposition instructions should be submitted as follows:

(1) *CONUS, U.S. Army Forces, Southern Command and Greenland.* Installations and activities located in CONUS, U.S. Army Forces, Southern Command, and Greenland will forward disposal requests to Commanding Officer, U.S. Army Edgewood Arsenal, ATTN: SMUEA–ISDO, Edgewood Arsenal, Md., 21010.

(2) *Oversea commands.* Army installations and activities located outside CONUS, other than Greenland and the U.S. Army Forces, Southern Command, will forward disposal requests in accordance with instructions of the theater commander.

b. Requests for disposal will contain the following information:

(1) Nomenclature and Federal stock number and, where applicable, serial numbers.

(2) Physical description of items to include—

(*a*) Solid, liquid, or gases.

(*b*) Quantity (number, weight, and volume and, if gaseous, the standard pressure).

(*c*) Number of individual items per package and type of package.

(*d*) Number of shipping containers.

(*e*) Exterior dimensions and weight of packaged shipping container.

(*f*) Shielding material and thickness, if applicable.

(*g*) ICC, USCG, or CAB permit or waiver number, if applicable.

(3) Chemical and radioisotopic description, to include—

(*a*) Hazardous chemicals present.

(*b*) For liquids, the solvent present.

(*c*) Radioisotopes present.

(4) Radioactivity and radiation measurements, to include—

(*a*) Millicuries of activity of each radioisotope.

(*b*) Maximum radiation dose rates (mrad/hr) at the surface and at 1 meter from the surface of the radioactive items, if practical. If dose rate at 1 meter is undetectable, report dose rate at 1 foot from surface. For alpha sources, report counts per minute at surface.

(*c*) Maximum radiation dose rates (mrad/hr) at the surface and (mrad/hr) at 1 meter from the surface of the package.

(*d*) Security consideration.

1. Classification.

2. Procedures for declassification.

c. Emergency requests will be made by the most expeditious means available.

16. Replies to disposal requests. Replies to ultimate disposal requests will furnish the following minimum information:

a. Any packaging, labeling, shipping, and special transportation information beyond that established by AR 55–55 and AR 55–355.

b. Adequate radiation safety requirements to be observed.

c. Preferred date and time for receiving shipment.

d. Special instructions to be observed during transit and at transfer points.

17. Shipment of unwanted radioactive material. *a.* Containers for radioactive material will be substantial enough to endure the shocks of transportation without allowing escape of radioactive material. Containers should comply with ICC container specifications.

b. Unwanted radioactive materials for disposal, when moved locally within an installation, may be moved by unit transportation under the supervision of a technically qualified officer, enlisted person, or Department of the Army civilian of the installation.

c. The post transportation officer will arrange for shipments of all unwanted radioactive material to be transported beyond the limits of an installation. Certification of the contents as to hazards, special requirements, safety precautions, will be made to the post transportation officer in accordance with AR 55–55. The post transportation officer will insure compliance with AR 55–55, AR 55–162, and AR 55–355 and will take such other actions as are necessary under existing regulations to insure safe and secure transport from origin to destination.

d. Use of U.S. mails including parcel post is prohibited for forwarding unwanted radioactive material.

18. Special shipping instructions for CONUS, Alaska, and Hawaii. *a.* Transportation of radioactive material and waste materials can be accomplished by either military or common carrier, whichever is more advantageous to the Government, and in strict accordance with applicable regulations. If, in the best interests of the Government, a waiver or permit is required for a given shipment, application for waiver or permit will be made to the Deputy Chief of Staff for Logistics, ATTN: Director of Transportation, for approval prior to submission in accordance with paragraph 203019 or 216035, AR 55–355.

b. When radioactive material is shipped by common carrier, marking and labeling will conform to AR 380–20, 55–55, and 55–355. In addition, the following supplementary information, if unclassified, will also be marked on each package:

(1) Radiation symbol and "CAUTION RADIOACTIVE MATERIAL."
(2) Consignee.
(3) Maximum dose rate in mrad/hr at surface of package.
(4) Maximum dose rate in mrad/hr at 1 meter from package.
(5) Radioisotopes present.
(6) Amount of radioactivity, i.e., number of curies, millicuries, or microcuries contained in the package.
(7) Words "No removable surface contamination".

c. Shipments to or passing through Canada will also conform to Canadian requirements.

19. Special shipping instructions for oversea areas other than Alaska and Hawaii. *a.* In oversea theaters, local national or international regulations in force within the country of origin and countries through which the unwanted radioactive materials are moved will apply.

b. Shipments of radioactive material destined for CONUS, Alaska, and Hawaii will be labeled and marked as required in paragraph 18.

c. Shipments not destined for CONUS, Alaska, and Hawaii will be marked in accordance with the requirements of the regulations of those areas to which and through which the shipments are to be made. In addition, information indicated in paragraph 18*b* if unclassified, will be marked on each package containing radioactive material.

20. Escort of shipments of unwanted radioactive material. *a.* In special situations, material will be escorted from the point of shipment into the radioactive material disposal facility. This is done in the following cases when—

(1) The material cannot be packaged and shipped without waiver of an ICC, CAB, or USCG requirement. Requests for waivers for such shipments, will list Deputy Chief of Staff for Logistics, ATTN: Director of Transportation, Department of the Army, as an intermediate address.
(2) Security considerations require an escort.
(3) The commanding officer of the shipping agency considers an escort is in the best interests of the Government based on an evaluation of inherent factors of public relations, economics, and degree of hazard involved.

b. Where escort of shipment of unwanted radioactive material is required, escort will be arranged for in accordance with section VI, AR 55–16 and AR 55–55. If qualified personnel are not available, escort assistance can be obtained from Commanding Officer, U.S. Army Technical Escort Unit, Edgewood Arsenal, Md., 21010.

Section III. ULTIMATE DISPOSAL

21. Disposal by radioactive material disposal facilities. *a.* Local disposal of AEC licensed radioactive materials will be in accordance with Sections 20.106, 20.301a and b and 20.303 of 10 CFR, Part 20; with regulations of local civil regulatory bodies; and where applicable, with international agreement. In oversea areas, the more restrictive regulations, domestic or foreign, will be followed.

Note. Copies of 10 CFR 20 are available from the U.S. Atomic Energy Commission, Director of Materials Licensing, Washington, DC, 20545.

b. The type of ultimate disposal operations conducted by each of the radioactive material disposal facilities located in CONUS or overseas will be coordinated with the Commanding General, U.S. Army Materiel Command. The operations of the radioactive material disposal facilities will be in accordance with TM 3–260. The Commanding General, U.S. Army Materiel Command, will conduct such liaison visits as are necessary to Army radioactive material disposal facilities to enable him to carry out his responsibilities, as outlined in

paragraph 4. In addition, [redacted] will provide for necessary technical assistance visits at the request of overseas commands.

22. **Disposal authorized locally.** *a.* Normally, ultimate disposal is limited to radioactive material disposal facilities (TM 3–260). However, units other than authorized radioactive material disposal facilities may dispose of radioactive materials as follows:

(1) Dispose of specific types and quantities of radioactive material in accordance with disposition instructions obtained in accordance with paragraphs 15 and 16.

(2) Dispose of effluents (liquids and gases) into unrestricted areas in accordance with Title 10, Code of Federal Regulations, Section 20.106, provided local governments do not prohibit such disposal. Compliance with concentrations established in Appendix B of Title 10, Code of Federal Regulations, Part 20 will be determined by averaging concentrations on a monthly basis instead of on a yearly basis.

(3) Dispose of liquids into the sanitary sewage system in accordance with Title 10, Code of Federal Regulations, Section 20.303, provided local governments do not prohibit such disposal.

b. Incineration of Atomic Energy Commission (AEC) licensed radioactive material is not authorized except by units possessing a valid AEC license which authorizes incineration of such materials.

c. Incineration of radioactive materials other than AEC licensed material and land burial of radioactive materials on Army installations is not authorized without approval of Commanding General, U.S. [redacted]my Materiel Command. Request for such approval will be forwarded through channels to Commanding General, U.S. Army Materiel Command, ATTN: AMCAD–S, Washington, D.C. 20315 and will contain all the information required by paragraph 7*n*, AR 40–37.

d. Conventional disposal of solid material is authorized for waste material which has been controlled through the period of radioactive decay to a normal background level of activity, i.e., less than 0.002 microcuries per gram. This procedure is recommended for facilities with adequate local storage and for materials containing short, half-life radioisotopes to decay to background level within less than 12 months. This procedure is used by some hospitals and laboratories where short, half-life radioisotopes are used in tracer techniques and the resulting waste contains low level activity in such items as excreta, laboratory animals, infectious waste, absorbent tissue, and sputum.

e. Disposal operations outside the United States, its territories and possessions, will also be subject to the radiological safety requirements of the host nation. In the event of a conflict in regulations, the more severe regulation will govern.

f. Waivers to the above requirements will be granted only for unusual circumstances. Requests for such waivers will be addressed to the Commanding General, U.S. Army Materiel Command, ATTN: AMCAD–S, Washington, D.C. 20315.

23. **Transfer, sale, or donation.** Transfer, sale, or donation of radioactive materiel to other than authorized Army recipients requires prior approval of the Deputy Chief of Staff for Logistics (see AR 700–52).

[AMCAD]

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:
To be distributed in accordance with DA Form 12-9 requirements for Logistics Responsibilities, Functions & Procedures, General:
Active Army: A. *NG:* B. *USAR:* A.

TAGO 708A

U.S. GOVERNMENT PRINTING OFFICE: 1966 250–468

CURRICULUM VITAE OF RADIATION RADIOLOGICAL PROTECTION OFFICER

1. Mr. Epifanio Cruz, DAC, SSN 522-22-5064, Fort Ord Radiological Protection Officer for nonhuman sources received the following training at the US Naval Schools Command, Treasure Island, California Radiac Instrument Maintenance course for a period of four weeks: March 1969.

a. Principles and practices of radiation.

b. Radioactivity measurement standardization and monitoring techniques and instruments.

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

d. Biological effects of radiation.

This training was a formal course and on-the-job.

2. EXPERIENCE WITH RADIATION.

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION	TYPE OF USE
CO 60	30 mil, C	Fort Ord, CA	11 years	Survey and wipe test
STR 90 Y90	100 mil, C	Fort Ord, CA	11 years	Calibration service
Ra 226	Unknown	Fort Ord, CA	11 years	Disposal service
H-3	Unknown			
CS137				
KR 85				
TH 232				
C060				
AM 241				
I 125				
Tc 90				
MO 99				
Plo 239	1-5 UC	Fort Ord, CA	11 years	Calibration service

and other isotopes used by the military

3. RADIATION DETECTION INSTRUMENTS.

a. AN/PDR-27: Number Available: 2
Radiation Detected: Gamma/Beta
Sensitivity Range: .5 to 500
Window Thickness: .0005 inches
Use: Monitoring, surveying and measuring

b. AN/PPR-60: Number Available: 1
Radiation Detected: Alpha/Gamma
Sensitivity Range: 0-2,000,000 CPM

c. AMS-2 Eberline, Air Monitoring System
Beta-Gamma Radioactive Particulate

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

Radioactive Surce, AV/VDM-2, Beta Particles/Brennstrahhing X-Rays
Radioactive Source, AN/UDM 6, Alpha Particles - intervals 6 months.
Radioactive Source, M3, Gamma Rays/Beta Particles.

Maximum amount of trapped gas leaked out of trap

$$= 2.1 \times \frac{10^6 \text{ uCi}}{\text{year}} \times 10^{-4} = \frac{104 \text{ uCi}}{\text{year}}$$

Exhaust rate of base exhaust system = 255 cfm

Air flow per year:

$$V = 169 \text{ cfm} \times 1.49 \times 10^{10} \frac{\text{ml/year}}{\text{cfm}}$$

$$V = 2.5 \times 10^{12} \text{ ml/year}$$

Average concentration at the point of release due to leakage gas:

$$C_{\substack{\text{max} \\ \text{leakage}}} = \frac{104 \text{ uCi/year}}{2.5 \times 10^{12} \text{ ml/year}}$$

$$= 4.6 \times 10^{-11} \text{ uCi/ml}$$

(3) Traps will initially be monitored by forcing a calibrated amount of Xenon 133 through the traps at a nominal rate, corresponding to that which a patient expires. This then gives the known entrance concentration rate. The concentration rate (mCi/ml/min) is monitored at the exhaust outlet by means of a Xenon gas monitor. Since the entrance and exit concentration rates are than known, the trapped efficiency can be determined. Both traps are expected to show better than 99% efficiency.

This procedure will be repeated on regular basis to determine trapping efficiency. It can be seen from the results of the preceeding calculation in 6b(2), (calculations for leakage gas) that a trapping efficiency of much less than 99% could be tolerated. The manufacturer indicates that our traps will be good for at least five years at the current rate of use. In any case, monitoring and surveillance methods will be continually applied. Saturation should be detected with the techniques since, at that point, the trapping efficiency would drop to very low values.

(4) The filters are encased in lead-shielded boxes. The surface radiation exposure will be checked regularly. Should a filter become saturated, it will be removed. Both ends of the filter will be capped off airtight. The unit will be allowed to set in the storage area for ten half lives (54 days).

(5) The Preventive Medicine Activity will monitor ventilation rates of all concerned areas on a quarterly basis to determine linear air flow volumes.