

VOID SHEET

TO: License Fee Management Branch

FROM: RIII - \_\_\_\_\_

SUBJECT: VOIDED APPLICATION

Control Number: 398220

Applicant: Army, Dept. of

License Number: 12-00722-13

Docket Number: 030-21073

Date Voided: 12-22-97

Reason for Void: at its own request, the licensee resubmitted its renewal application in its entirety.

Lynn Hunter  
Signature

12-22-97  
Date

Attachment:  
Official Record Copy of  
Voided Action

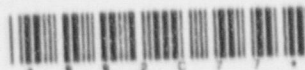
FOR LFMB USE ONLY

- ☐ Refund Authorized and processed  
☒ No Refund Due  
☒ Fee Exempt or Fee Not Required

Comments: \_\_\_\_\_

Log completed ☒

Processed by: SAC 12/30/97



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BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM  
AND  
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)  
INFORMATION FROM LTS

PROGRAM CODE: 03124  
STATUS CODE: 2  
FEE CATEGORY: EX 3P  
EXP. DATE: 19950331  
FEE COMMENTS:  
DECOM FIN ASSUR "REDDT" N  
|||||

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED  
APPLICANT/LICENSEE: ARMY, DEPARTMENT OF THE  
RECEIVED DATE: 950227  
DUCKET NO: 3021073  
CONTROL NO.: 398220  
LICENSE NO.: 12-00722-13  
ACTION TYPE: RENEWAL

2. FEE ATTACHED

AMOUNT: \*  
CHECK NO.: \*

3. COMMENTS

\* Fee Ex

SIGNED  
DATE

*D. Hersey*  
3-7-95

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

\_\_\_\_\_  
\_\_\_\_\_

FEE EXEMPT



(10-84)  
10 CFR 30, 32, 33,  
34, 35, 36, 39 and 40

## APPLICATION FOR MATERIAL LICENSE

ESTIMATE BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 9 HOURS. SUBMITTAL OF THE APPLICATION IS NECESSARY TO DETERMINE THAT THE APPLICANT IS QUALIFIED AND THAT ADEQUATE PROCEDURES EXIST TO PROTECT THE PUBLIC HEALTH AND SAFETY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0120), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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.

## APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY  
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555-0001

## 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:

LICENSING ASSISTANT SECTION  
NUCLEAR MATERIALS SAFETY BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

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

NUCLEAR MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION II  
101 MARIETTA STREET, NW, SUITE 2900  
ATLANTA, GA 30323-0199

## IF YOU ARE LOCATED IN:

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

MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION III  
801 WARRENVILLE RD.  
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS,  
LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA,  
OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH,  
WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TX 76011-8064

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 JURISDICTIONS.

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

- ☐ A. NEW LICENSE  
☐ B. AMENDMENT TO LICENSE NUMBER \_\_\_\_\_  
☒ C. RENEWAL OF LICENSE NUMBER HML 12-00722-13

## 2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip code)

DIRECTOR, Armament and Chemical Acquisition  
and Logistics Activity  
ATTN: AMSTA-AC-SF  
Rock Island, IL 61299-7630

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

U.S. Army, U.S. Marine Corps temporary jobsites worldwide

## 4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Jeffrey Havenner

TELEPHONE NUMBER  
(309) 782-2965

5. SUBMIT ITEMS 6 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

## 6. 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. See Supplement A

## 6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

See Supplement B

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

See Supplement C

## 8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

See Supplement D

## 9. FACILITIES AND EQUIPMENT.

See Supplement E

## 10. RADIATION SAFETY PROGRAM

See Supplement F

## 11. WASTE MANAGEMENT

See Supplement G

## 12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY Exempt 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, 36, 39 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. 1, 9 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.

## CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE

RICHARD D. HUSSON, DIRECTOR, ACALA

## SIGNATURE

*Richard D. Husson*

## DATE

2.24.95

## FOR NRC USE ONLY

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

RECEIVED

REGION III

398220

A-Approval

X-Signature

C-Concurrence

R-Review

FOR

X-AMSTA-AC

Mrs. Betty Peterson, AMSTA-AC-SF, x2962

AMSTA-AC-SF

24 Feb 95

SUBJECT: Request for Renewal of Nuclear Regulatory Commission (NRC) Byproduct Material License 12-00722-13

1. PURPOSE: To forward the renewal request to the NRC.

2. DISCUSSION:

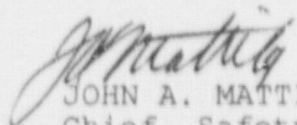
a. This license covers the world-wide use of the M8A1, Chemical Agent Alarm by Army and Marine Corps personnel. The license package is essentially the same as has been submitted previously.

b. The significant change is the change from a wipe test required every three years to wipe test every year. The basis for this change is discussed in Wipe test Results From Field Assots (encl 3).

3. CONCLUSION: The NRC license 12-00722-13 must be renewed.

4. RECOMMENDATION: That the Director sign the facing memorandum and the three copies of the NRC Form 313, Application for Material License.

Encls

  
JOHN A. MATTILA  
Chief, Safety Office

RECEIVED  
FEB 27 1995  
REGION III





DEPARTMENT OF THE ARMY  
ARMAMENT AND CHEMICAL ACQUISITION AND LOGISTICS ACTIVITY  
ROCK ISLAND, ILLINOIS 61299-7630



February 24, 1995

AMSTA-AC-SF

Nuclear Regulatory Commission, Region III  
Nuclear Materials Licensing Section  
801 Warrenville Road  
Lisle, IL 60532-4351

Dear Sir:

Attached are three signed copies of the application for renewal of Byproduct Material License 12-00722-13, issued to U.S. Army Armament and Chemical Acquisition and Logistics Activity.

This action has been coordinated with and approved by the Headquarters, Army Material Command Safety Office.

The point of contact is Mrs. Betty Peterson, AMSTA-AC-SF, (309) 782-2962, e-mail address [bpeterso@ria-emh2.army.mil](mailto:bpeterso@ria-emh2.army.mil).

R. D. HUSSON  
Director, Armament Chemical Acquisition  
and Logistics Activity

Enclosures

Copies Furnished:

HQ, AMC, ATTN: AMCSF-P (Mr. J. Manfre), 5001 Eisenhower Ave,  
Alexandria, VA 22333

### Executive Summary

This application is to renew Nuclear Regulatory Commission License BML-12-00722-13 in its entirety.

The M8A1 Chemical Agent Automatic Alarm consists of the M43A1 Chemical Agent Detector (CAD) and the M42 Remote Sensing Alarm. A component of the M43A1 CAD is the cell module that contains 250 microcuries of americium 241.

The source is located in the cell module of the detector and is a foil disk made of americium dioxide in a gold matrix. The foil layer containing the americium is pressed between a gold-palladium alloy face and a silver backing this is done by means of mechanical rolling. The completed source disk is affixed using epoxy, to a metal screen which is secured by a retainer ring within the sensing Cell Module. The source is certified as special form by the manufacturer.

The M43A1 CAD is used to detect the presence of battlefield chemical agents and warn troops of their presence. It is intended to be used outdoors either emplaced on the ground or on the exterior of a vehicle by special mounting brackets. Indoor operation for training or maintenance purposes must use an exit port filter unit. Distribution of this device will be world wide to all combat deployable units of the Army and Marine Corps.

The Cell Module is wipe tested for leakage annually. This represents a significant change which takes effect with this license renewal. The reasons for this change are discussed in enclosure 3.

No manufacturing of sources is done under this license. Manufacturers of the source and cell module are required to obtain their own license to do so from the NRC or appropriate Agreement State.



NRC LICENSE FORM 313  
SUPPLEMENTAL INFORMATION

SECTION	DESCRIPTION
SUPPLEMENT A	RADIOACTIVE MATERIAL
SUPPLEMENT B	PURPOSE FOR WHICH LICENSED MATERIAL WILL BE USED
SUPPLEMENT C	INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY AND THEIR EXPERIENCE
SUPPLEMENT D	TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS
SUPPLEMENT E	FACILITIES AND EQUIPMENT
SUPPLEMENT F	RADIATION PROTECTION PROGRAM
SUPPLEMENT G	WASTE MANAGEMENT
Enclosure 1	Source Drawing
Enclosure 2	Device Drawing
Enclosure 3	Wipe Test Results From Field Assets
Enclosure 4	Radiation Caution Plate
Enclosure 5	Resumes
Enclosure 6	Record of Environmental Consideration

SUPPLEMENT A



## Supplement A

### Item 5. Radioactive Material

- a. Element and Mass Number: americium 241
- b. Chemical and Physical Form: americium dioxide as a foil
- c. Maximum amount which will be possessed at any one time: 25 curies or a maximum of 100,000 sources. Each individual source will contain 250 microcuries +/- 20% (301.5 microcuries max).

SUPPLEMENT B



## Supplement B

### Item 6. Purposes for which Licensed Material will be Used:

The americium-241 source described in this application is an integral part of the M43A1 Chemical Agent Detector. This instrument is used to detect and warn soldiers of the presence of toxic nerve gases on the battle field. The Am-241 source is located in the cell module of the detector and is a foil disk made of americium dioxide in a gold matrix. The foil layer containing the americium is pressed between a gold-palladium alloy face and a silver backing this is done by means of mechanical rolling. The completed source disk is affixed using epoxy, to a metal screen which is secured by a retainer ring within the sensing Cell Module. The source is certified as special form by the manufacturer. The cell module itself is a zinc metal alloy box which is designed to preclude direct contact with the source either by operators or by personnel servicing the instrument. The cell module is never opened at any time during use of the device or during maintenance.

The M43A1 CAD functions specifically to detect the presence of battlefield chemical agents and warn troops of their presence. It is intended to be used outdoors either emplaced on the ground or on the exterior of a vehicle by special mounting brackets. Indoor operation for training or maintenance purposes must use a filter designed to affix to the air outlet port of the instrument.

SUPPLEMENT C



### Supplement C

Item 7, Individuals Responsible for the Radiation Safety Program,  
Their Training and Experience

Mr. John Ma' la, ACALA Safety Director, is designated License Manager. Mr. Jeffrey Havenner, ACALA Health Physicist is the Radiation Safety Officer (RSO). Ms. Elizabeth Peterson and Mr. Gavin Ziegler, ACALA Health Physicists are the Alternate Radiation Safety Officers.

Resumes are at Enclosure 5.

SUPPLEMENT D



Item 8. Training for Individuals Working in or Frequenting Restricted Areas.

1. User Training

a. For purposes of this license a user is defined as an individual or unit of the Army or Marine Corps which operates or possesses M43A1 Chemical Agent Detector.

b. Users of the M43A1 Chemical Agent Detector are provided with a published technical manual. This publication informs the user of the device that americium 241 is a radioactive material and is contained in the device. The manual specifies the precautions that must be taken and controls that must be observed for the safe use of the device. The published instructions to the users ensure uniformity in the use of the device throughout the Army during its life cycle regardless of the locations in which the device is used. The technical manual instructions are further specific in giving storage requirements for maintaining security over the device. Current copies of the technical manual are maintained in the files of this Activity for inspection by the Commission.

c. The Users of the M43A1 detector are authorized to store and operate the device. The technical manual instructions are specific in prohibiting users of the device from removing the cell module containing the radioactive source and/or the pump module for any reason.

d) Procedures limit the user to a performing a visual inspection of the M43A1 for obvious defects which might result from wear and tear, i.e. missing or broken components. The performance of a simple check for proper air flow is also authorized at the user level. None of these procedures requires disassembly of the device into subassemblies nor involves any potential exposure to Am-241. Users of the M43A1, therefore, do not come in direct contact with the Am-241 source at any time under normal operation.

e. The Users of this device receive 2 hours of awareness instruction from their supervisors. Supervisors are defined in paragraph f. The awareness training is to insure use of the device in accordance with the technical manual.

f. User supervisors are formally appointed individuals designated as Chemical, Biological, Radiological (CBR) Officer or Noncommissioned Officer; Nuclear, Biological, Chemical (NBC) Officer or Noncommissioned Officer; Radiological Protection Officer (RPO) or other accountable individual designated to insure local compliance with the license requirements as presented in the technical manual. Any of these individuals may provide users of the M43A1 with the required training.

## 2. Maintenance Training

a. Maintenance personnel who repair the M43A1 Chemical Agent Detector are assigned to support maintenance units at posts camps and stations in the U.S. Army and Marine Corps.

b. Maintenance personnel are provided with a published technical manual. This publication informs the maintainer of the device that americium 241 is a radioactive material and is contained in the device. The technical manual specifies the precautions that must be taken and controls that must be observed for this to maintain the device in a safe manner and minimize the potential for exposure to americium-241.

c. The published instructions to the maintenance personnel ensures that uniform procedures will be used to service the device in all locations which are authorized to perform direct support maintenance on this device. These instructions reflect the same control provisions for the device as established in this license application. Current copies of these direct support technical manual are maintained in the files of this Activity for inspection by the Commission.

d. Maintenance personnel for the M43A1 may be required to remove the pump module or cell module. They also will perform the required leakage tests on the device. These operations do not involve any direct contact with the Am-241 source since the cell module is never to be further disassembled. There is, however, a slightly increased risk of exposure for these individuals as their tasks involve opening the air path of the device as the modules are removed. This has the potential to expose them to any Am-241 that may have leaked from the source and been deposited in the air path. The risk is still judged to be minimal since the air path is again sealed when the modules are replaced.

e. For personnel performing maintenance on the M43A1 CAD, 8 hours of radiation safety training are required. This training incorporates the 2 hours of instruction described in paragraph 1c above and is augmented with the following information:

- 1) Introduction to the hazards of americium 241 and personal protection against those hazards.
- 2) Basic radiation units and biological effects of radiation.
- 3) Use of alpha radiation detection and survey instrumentation.
- 4) Wipe testing the M43A1 Chemical Agent Detector.
- 5) Emergency procedures in the event of release.



6) Serial number tracking of the Am-241 source.

f. The following facilities are authorized to perform direct support maintenance of the M43A1:

- o Test Measurement Diagnostic Equipment Support Groups;
- o Repair Depots;
- o Intermediate Direct Support Maintenance facilities
- o National Guard State Calibration shops

### 3. Depot Training

a. Depot personnel perform maintenance on the M43A1 Chemical Agent Detector which involves removal of the cell or pump modules or wipe testing the cell modules. In addition they may remove and replace the tubing of the air path and overhaul the pump module assembly. The procedures are performed at Anniston Army Depot, Anniston, AL or Marine Corps Logistics Base, Albany, Ga.

b. Depot personnel are provided with a Depot Maintenance Work Requirement for the M43A1. This publication informs the depot personnel of the hazards associated with the americium 241 contained in the device and specify the precautions that must be taken and controls that must be observed for this device during and after maintenance activities. Current copies of these Depot Maintenance Work Requirements are maintained in the files of this Activity for inspection by the Commission.

c. Each depot will have a designated Radiation Protection Officer (RPO) and at least one alternate. The RPO's at depot will have formal training in the following areas.

- o Principles and Practices of Radiation Protection
- o Radioactivity Measurement Standardization and Monitoring Techniques and Instruments.
- o Mathematics and Calculations Basic to the Use and Measurement of Radioactivity.
- o Biological Effects of Radiation.
- o Use of alpha radiation detection and survey instrumentation.
- o Wipe testing the M43A1 Chemical Agent Detector.
- o Emergency procedures in the event of release.

Successful completion of the U.S. Army Radiological Safety Course (4J-F3/494/-f14, formerly 7KF3) offered at the U.S. Army Chemical School, Ft. McClellan AL. or the RPO Course offered by the U.S. Navy Radiation Affairs Support Office (RASO), Yorktown, Va, satisfies this requirement. Alternate training for depot RPO's must be evaluated and approved by the ACALA RSO. The depot RSO is responsible for training depot maintenance personnel for the M43A1 CAD at least to the standards of paragraph 2e of this suppliment.



SUPPLEMENT E

## Supplement E

### Item 9. Facilities and Equipment:

#### 1. User Requirements.

a. The M43A1 Chemical Agent Detector is portable and is used in backpack, mobile and fixed position. When operated indoors for any purpose, a 0.2 micron exit port filter must be used in accordance with instructions in the technical manual.

b. When mounted on a vehicle and operated when the vehicle is in motion, the M43A1 must be mounted externally on the vehicle or in a manner such that the exit port is vented to the outside.

c. The user must ensure compliance with the Radiation Testing and Tracking System and ensure the following:

1) The M43A1 Detector is submitted to an authorized maintenance facility for leakage testing annually from the date on which the test was last performed. This represents a change from previous procedures.

2) M43A1 detectors which have exceeded the one year period between wipe tests must be wipe tested prior to putting the device in service.

3) Ensure that all shipments, receipts and other transactions regarding changes of ownership are properly reported to the tracking system.

d. User storage areas will be secured against unauthorized access. The storage areas will be located so as to be free from the danger of flooding and outside the danger radius of flammable materials and explosives.

#### 2. Depot Storage Requirements.

a. Depots authorized to store bulk quantities of M43A1 Chemical Agent Detectors and Cell Modules will store these items in rooms, or caged areas designated for the storage of radioactive items.

b. Buildings in which these items are to be stored will also be those designated for the purpose of storing radioactive items. Buildings and storage areas for the M43A1 and Cell Modules will be posted with signs stating "Radioactive Material". The storage locations will be secured against unauthorized access and will be free from the danger of flooding and outside the danger radius of flammable materials and explosives.

c. There is no limit to the number of detectors and/or cell modules per storage area at bulk storage locations.



d. Depot storage areas for the M43A1 and Cell Module will be monitored monthly with appropriately calibrated portable alpha radiation survey meters. Wipe test surveys of bulk storage areas will be performed quarterly. Wipe tests will be analyzed using gas flow proportional counting system or equivalent alpha counting instrumentation. Limits for removable alpha contamination given in AR 385-11 table 4-3 will apply (100 dpm/100cm<sup>2</sup>).

e. Scintillation Counting Systems or equivalent may be used to analyze wipe tests. This is permissible provided that the machines are calibrated in accordance with paragraph 4d of this supplement.

f. Depots will process receipt, shipment and other transactions and report these to the Radiation Testing and Tracking System.

g. Any M43A1 Chemical Agent detector or Cell Module that is in depot storage is exempt from the routine annual leakage testing requirement. Instead, M43A1 Chemical Agent Detectors and Cell Modules will be leak tested prior to shipment to a new owning unit. These wipe tests will be posted to the Radiation Testing and Tracking System.

### 3. User Maintenance Facilities

a. Personnel responsible for maintenance involving removal and replacement of cell or pump modules will have an AN/PDR 77, AN/PDR 56F or AN/PDR 60 or equivalent alpha survey instrument. The maintenance areas will be surveyed at the end of each work day that maintenance is performed.

b. Maintenance facilities will process receipt, shipment, wipe test, cell exchange and other transactions for spare cell modules and returns to depot as required for the Radiation Testing and Tracking System, described in Supplement F.

### 4. Depot Maintenance Facilities

a. Maintenance Depots will wipe test all field returned M43A1 detectors and obtain results prior to start of work. These wipe tests may be analyzed locally provided the conditions of paragraph 4d of this supplement are certified by the Depot Safety Office as being complied with.

b. Results of wipe tests in excess of 20 dpm will be considered to indicate a leaking source. Any such device will be turned in through supply channels to Anniston Army Depot or the Marine Corps Logistics Base at Albany GA.



#### 4. Calibration of Instruments

a. Calibration service for active level portable survey may be obtained from regional U. S. Army Test, Measurement and Diagnostic Equipment Support Group calibration facilities.

b. All radiation survey equipment used under this license will be calibrated at intervals will be those specified for calibration and repair Army materiel. For ionizing radiation monitoring instrumentation used in personnel safety application under this license, these intervals will not exceed one year in duration.

c. Calibration sources used for all active level RADIAC equipment (which includes both alpha and beta/gamma radiation measurement instruments must be traceable to National Institute of Standards Technology (formerly the National Bureau of Standards).

d. Gas flow proportional or Liquid Scintillation counting systems used to evaluate wipe tests will be calibrated at least every 90 days using alpha radiation reference sources traceable to national standards. Certified alpha radiation check sources will be used prior to each day's operation.

SUPPLEMENT F



## Supplement F

### The ACALA Radiation Safety Program:

#### 1. General:

The U.S. Army Armament and Chemical Acquisition and Logistics Activity is responsible for management and support of the M8A1 Chemical Agent Alarm of which the M43A1 Chemical Agent Detector is a component. This includes the radiation protection officer and NRC license management functions.

#### 2. Organization of the ACALA Safety Office:

a) The ACALA Safety Office reports directly to the Director of the ACALA, Mr. Richard D. Husson, who is the signature authority for license applications. The License Manager is Mr. John Matilla, Chief of the ACALA Safety Office.

b) The Health physics staff of the ACALA administers the radiation safety program under the technical supervision of the Radiation Protection Officer and Alternates whose resumes appear at Enclosure 5.

#### 3. Ionizing Radiation Control Committee:

a) In addition to the health physics staff, the Safety Office is assisted in executing the radiation safety program for its NRC license by the Ionizing Radiation Control Committee (IRCC). This committee meets at least quarterly and includes representatives from all of the functional directorates of the ACALA listed below.

The IRCC provides the license manager with guidance for the formulation of policy and assistance in the implementation of policy for the management of NRC licensed Materials.

##### b) IRCC Membership

- Safety Office
- Acquisition Center (Procurement)
- Logistic Engineering and Maintenance Directorate
- Materiel Management Directorate
- Customer Support Directorate
- Weapon Systems Management Directorate
- Security Assistance Management Directorate
- Legal Group
- Quality Assurance

#### 4. Radiation Safety Supervision:

##### a) Local Radiation Protection Officers (RPO):

(1) The commodities covered by this application are issued to United States Army and Marine Corps units for use at



locations world wide. The U.S. Army and Marine Corps, under authority of their own regulations governing the use of radioactive commodities, requires that each post, camp and station where commodities containing radioactive materials are used, maintained and/or stored have a Radiation Protection Officer (RPO) appointed on orders by the local commander.

(2) The local or installation RPO acts as the licensee's representative for ensuring that license conditions are fulfilled at the site where the material is used. The task of local RPO's at posts, camps and stations and alternates is to ensure the safe handling, storage and maintenance of commodities containing radioactive sources. In addition the installation RPO is responsible for the following:

i) Maintain an inventory of radioactive materials at the post camp or station.

ii) Conduct regular inspections and perform routine radiation monitoring and survey tasks.

iii) Ensure that training for individuals working with licensed material is accomplished.

iv) Respond to incidents and or accidents involving licensed material and reporting the same to the ACALA RPO.

v) Maintaining records of his or her actions at the local level for inspection by the ACALA RPO.

(3) All installation RPO's are required to complete the U.S. Army Radiological Safety Course (4J-F3/494-F14, formerly 7KF3) offered at the U.S. Army Chemical School, Ft. McClellan AL or equivalent.

b) Major Command (MACOM) Radiation Protection Officers:

(1) The Army/Marine Corps is organized into several Major Commands (MACOMs). All posts, camps and stations fall under the jurisdiction of one of these MACOMs. Each MACOM safety office has a Radiation protection officer appointed by the MACOM Commander.

(2) The MACOM RPO's task is to oversee the actions of the local installation RPOs under the MACOM Commander's jurisdiction.

(3) The MACOM RPO is the primary point of contact for the ACALA radiation protection officer to ensure that license requirements are adhered to at the user level.

(4) The list of MACOMs and RPOs is as follows:

(a) Marine Corps is under the jurisdiction of the Commandant of the Marine Corps, Safety Division (SD), Headquarters U.S. Marine Corps, 2 Navy Annex, Washington, DC 20380-1775. RSO: Radiation Safety Specialist.

(b) Depot receipt, bulk storage, and shipping activities are under the jurisdiction of the Defense Logistics Agency (DLA), ATTN: DLA-WH (RSO), Cameron Station, Alexandria, VA.

(c) The Army is organized into several Major Army Commands (MACOMS). Army MACOMS are as follows:

(1) U.S. Army Forces Command, ATTN: FCJI-SO (RSO), Fort McPherson, GA 30330-6000.

(2) U.S. Army Training and Doctrine Command, ATTN: ATOS-ER (RSO), Fort Monroe, VA 23651-5000.

(3) U.S. Army Special Operations Command, ATTN: AAOS (RSO), Fort Bragg, NC 28307-5000.

(4) U.S. Army Reserve Command, ATTN: AFRC-SA (RSO), 3800 SW Camp Creek Parkway, Atlanta, GA 30331.

(5) U.S. Army National Guard Bureau, Washington, DC 20310-2500. RSO: CECOM (see below).

(6) U.S. Army South Command, ATTN: UNIT 7101 SCSF (RSO)

(7) U.S. Forces, Korea/Eighth U.S. Army, ATTN: EASF (RSO)

(8) U.S. Army Pacific command, ATTN: APSL (RSO)

(9) U.S. Army Europe & 7th Army, ATTN: AEAGA-S (RSO)

(10) U.S. Army Materiel Command (AMC), ATTN: AMCSF-P (RSO), 5001 Eisenhower Avenue, Alexandria, VA 22333-0001.  
Subordinates to AMC include:

a. Depot maintenance activities are managed by U.S. Army, Industrial Operations Command (IOC), ATTN: AMSMC-SFS (RSO), Rock Island, IL 61299-6000.

b. U.S. Army Communications-Electronics Command (CECOM), ATTN: AMSEL-SF-RER (RSO), Fort Monmouth, NJ 07703-5000. This organization serves as the National Guard RSO.

c. U.S. Army, Armament and Chemical Acquisition and Logistics Activity (ACALA), ATTN: AMSTA-AC-SF (RSO), Rock Island, IL 61299-7630.



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(b) Depot receipt, bulk storage, and shipping activities are under the jurisdiction of the Defense Logistics Agency (DLA), ATTN: DLA-WH (RSO), Cameron Station, Alexandria, VA.

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(3) U.S. Army Special Operations Command, ATTN: AAOS (RSO), Fort Bragg, NC 28307-5000.

(4) U.S. Army Reserve Command, ATTN: AFRC-SA (RSO), 3800 SW Camp Creek Parkway, Atlanta, GA 30331.

(5) U.S. Army National Guard Bureau, Washington, DC 20310-2500. RSO: CECOM (see below).

(6) U.S. Army South Command, ATTN: UNIT 7101 SOSF (RSO)

(7) U.S. Forces, Korea/Eighth U.S. Army, ATTN: EASF (RSO)

(8) U.S. Army Pacific command, ATTN: APSL (RSO)

(9) U.S. Army Europe & 7th Army, ATTN: AEAGA-S (RSO)

(10) U.S. Army Materiel Command (AMC), ATTN: AMCSF-P (RSO), 5001 Eisenhower Avenue, Alexandria, VA 22333-0001. Subordinates to AMC include:

a. Depot maintenance activities are managed by U.S. Army, Industrial Operations Command (IOC), ATTN: AMSMC-SFS (RSO), Rock Island, IL 61299-6000.

b. U.S. Army Communications-Electronics Command (CECOM), ATTN: AMSEL-SF-RER (RSO), Fort Monmouth, NJ 07703-5000. This organization serves as the National Guard RSO.

c. U.S. Army, Armament and Chemical Acquisition and Logistics Activity (ACALA), ATTN: AMSTA-AC-SF (RSO), Rock Island, IL 61299-7630.



5. Depot Storage Facilities: Depot Facilities managed by the Defense Logistics Agency or the Army are authorized to store bulk quantities of the M43A1 Chemical Agent Detector.

6. Radiation Safety Inspection Program:

a) The ACALA health physicists conduct a regular program of license compliance inspections of posts camps and stations where commodities are used under this license. Inspections are also conducted on a regular basis at storage facilities and maintenance facilities named in this application as conducting NRC licensed activities.

b) The ACALA is assisted in conducting a program of inspections by the U.S. Army Communications/Electronics Command (CECOM), which is designated as Radiation Protection Officer for Army National Guard units. Their health physicists conduct independent inspections of National Guard facilities and incorporates our license inspection checklists regarding ACALA commodities. The CECOM inspectors provide copies of their reports to the ACALA Safety Office. The ACALA is also using other Army organizations, U.S. Army Test Measurement and Diagnostic Equipment Activity to assist with inspections.

c) Independent inspections of ACALA NRC License compliance are conducted by the U.S. Army Environmental Hygiene Agency which is under the command of the Army Medical Department under authority of the Army Surgeon General. These inspection results are reported to this command through medical channels.

7. Radiation Testing and Tracking System (RATTS):

a) This is a computerized tracking system which records the owner of each cell module covered by this license. This system also monitors and records compliance with the requirement of this license to perform leakage testing of all cell modules covered by this license. Each cell module for the M43A1 Chemical Agent Detector is tracked by means of its own unique serial number.

b) Users and maintainers of the M43A1 Chemical Agent Detector are required to submit reports to the tracking system each time a cell module covered by this license changes ownership or is tested for leakage.

c) When a defective cell module is removed by the appropriate Army maintenance unit it is returned to the Anniston Army depot for disposal as radioactive waste. This transaction is recorded via the tracking system.

d) Anniston Army Depot maintains a record of the cell module serial numbers that have been disposed of as radioactive waste. These records are available to the ACALA RPO during inspection and upon request.

8. Quality Assurance Program:

a) During production the ACALA requires independent testing of manufactured items (cell modules) to ensure their integrity.

b) The ACALA has established a quality assurance program to conduct independent surveillance of source integrity in the field.

9. Radioactive Waste Disposal:

a) The ACALA is supported for disposal of radioactive waste from its commodity programs by the U.S. Army Armament, Munitions and Chemical Command (AMCCOM). The AMCCOM is tasked with proper disposal of all DOD Radioactive Waste through its Radioactive Waste Disposal office.

b) The destination for disposal of the radioactive waste is determined by the geographic location of the material at the time it is declared to be waste. Cell modules determined to be nonfunctional become radioactive waste under this license. This determination is made at the Anniston Army Depot maintenance facility which resides in the Southeast Low Level Radioactive Waste Disposal Compact and currently has access to the Barnwell S.C. disposal facility.

c) Restrictions on the disposal of americium-241 at the Barnwell facility may dictate that waste generated under this license be placed in interim storage at a NRC licensed radioactive waste storage facility.



SUPPLEMENT G



SUPPLEMENT G

## Supplement G

### Item 11. Waste Management.

1. The responsible agency for the safe disposal of all unwanted, low-level radioactive waste in the Department of Defense is the Department of Defense Executive Agency for Low Level Radioactive Waste, located at Rock Island, Illinois. As program manager, the Agency issues instructions to all military users on proper packaging and marking of shipments of radioactive waste. The agency contracts with qualified companies to provide brokerage, shipping and disposal services. In addition, the Agency conducts on-site audits of some prospective radioactive waste shipments.

2. The ACALA is supported for disposal of radioactive waste from its commodity programs by this agency. Radioactive waste generated by users, maintenance facilities and depots is packaged in containers acceptable for commercial land burial. Unwanted cell modules containing americium-241 sources are shipped and disposed in accordance with all current DOT and NRC regulations.

3. Facility Decommissioning. Decontamination will be conducted prior release of facilities and equipment to unrestricted areas. Surveys will be conducted for removable contamination on potentially contaminated surfaces (e.g., floors, walls, furnishings, equipment, etc.). Decontamination procedures will be repeated until contamination levels are ALARA or additional efforts do not significantly reduce contamination levels below  $20^1$  DPM per  $100\text{ cm}^2$ . Decommissioning of Army facilities will be conducted in accordance with Army radiation safety program closeout survey instructions. Other services will operate similarly.

---

<sup>1</sup> Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material, U.S. NRC, August 1987.



ENCLOSURE 1



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5.-AMERICIUM 241-SPECIAL FORM

6.- SOURCE MAT'L TO BE 125 ±20% MICROCURIES/SQ. CM. OVER ENTIRE DISK, ONE SIDE ONLY.

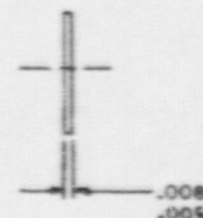
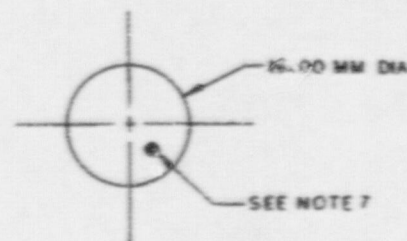
7.- MARK APPR/X 1/8" DIA SPOT ON INACTIVE SIDE.

8.- CAUTION-RADIOACTIVE MATERIAL- PROCESS AND HANDLING IN ACCORDANCE WITH CODE OF FEDERAL REGULATIONS- CFR-10. TRANSPORTATION IN ACCORDANCE WITH CFR-49

9.- THE AMERICIUM FOIL SOURCE SHOULD BE WIPE TESTED USING STANDARD SCINTILLATION TECHNIQUES BEFORE ASSEMBLY INTO CELL. TOTAL REMOVABLE SURFACE CONTAMINATION SHOULD BE LESS THAN 5 NANOCURIES.

SUPPLIER DATA		
FSCN	PART NUMBER	NAME AND ADDRESS
51431	AMM5	AMERSHAM/SEARLS CORP. 2636 S CLEARBROOK DRIVE ARLINGTON HEIGHTS, IL 60005
5K923	NRD 1001	NRD DIV. MARK III INDUSTRIES 2937 ALI. BOULEVARD GRAND ISLAND, NY. 14072

FOR QUALITY ASSURANCE PROVISIONS  
SEE QAP 5-15-8155



# NOTES:

1. THIS DRAWING SHALL BE INTERPRETED IN ACCORDANCE WITH APPLICABLE STANDARDS LISTED IN MIL SPEC 9664-0000

2. THE FOLLOWING ARE MANDATORY WHEN INDICATED BY R

☐ REMOVE BURRS ☐ BREAK SHARP EDGES .010 MAX

☐ FILLETS .010 MAX R.

☐ FIN ALL OVER, EXCEPT AS NOTED

☐ DIMENSIONS APPLY AFTER PLATING

☐ TOLERANCES ON STOCK MATERIAL SIZES, SHALL BE AS SPECIFIED IN APPLICABLE SPECIFICATIONS.

3. ONLY THE ITEM DESCRIBED ON THIS DRAWING WHEN PROCURED FROM THE VENDOR(S) LISTED HEREON IS APPROVED BY CHEMICAL SYSTEMS LABORATORY, ABERDEEN PROVING GROUND, MD.21010 FOR USE IN THE APPLICATION(S) SPECIFIED HEREON. A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR APPROVAL BY CHEMICAL SYSTEMS LABORATORY, ABERDEEN PROVING GROUND, MD.21010.

4. IDENTIFICATION OF THE APPROVED SOURCE(S) HEREON IS NOT TO BE CONSIDERED AS A GUARANTEE OF PRESENT OR CONTINUED AVAILABILITY AS A SOURCE OF SUPPLY FOR THE ITEM DESCRIBED ON THE DRAWING.

## SOURCE CONTROL DRAWING

QTY REQD	DRAWING OR PART NO.	NOMENCLATURE	MATERIAL	SPECIFICATION	ITEM NO.
LIST OF MATERIALS					
APPROVAL		UNLESS OTHERWISE SPECIFIED		DATE OF REVISION	
NEXT REV		DIMENSIONS ARE IN INCHES		80-08-15	
85-15-8154		TOLERANCES ON:		ERA WC	
		2 PLACE DECIMALS ±.25MM			
		3 PLACE DECIMALS ±			
		FRACTIONS ± 1/32			
		ANGLES ± 5'			
MATERIAL		APPROVED BY		APPROVED BY	
SEE NOTE 546		James A. Leop		James A. Leop	
		Approved by		Approved by	
		J. E. Cleary		J. E. Cleary	
		HONEYWELL INC		HONEYWELL INC	
		ST PETERSBURG FLA		ST PETERSBURG FLA	
		CODE IDENT NO.		CODE IDENT NO.	
		81361		81361	
		C		C	
		C5-15-8155		C5-15-8155	
		SCALE 2/1		SCALE 2/1	
		DPAK 11-78-C-00-00		DPAK 11-78-C-00-00	

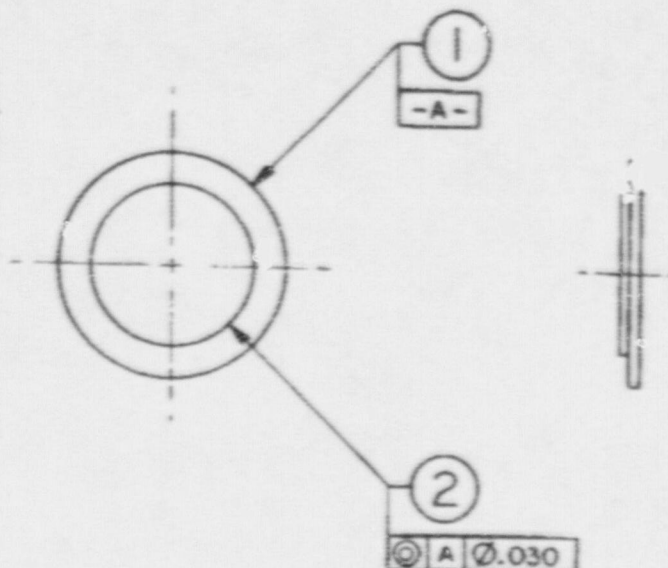
DISK, SOURCE

NOTES: UNDER GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED AS IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OF PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THEREIN.

NOTICE: THIS DRAWING IS FOR USE ONLY IN CONNECTION WITH PROCUREMENT BY THE UNITED STATES GOVERNMENT AND SHALL NOT BE USED FOR REPRODUCTION EITHER WHOLLY OR IN PART FOR ANY OTHER PURPOSE EXCEPT WHEN SPECIALLY AUTHORIZED.

REVISIONS			
LTN	DESCRIPTION	DATE	APPROVAL
A	NOR Z03-008-001 INC	17 FEB 68	22/82

5. CAUTION — RADIOACTIVE MATERIAL — PROCESS AND HANDLE IN ACCORDANCE WITH CODE OF FEDERAL REGULATIONS — CFR-10, TRANSPORTATION IN ACCORDANCE WITH CFR-49



SEE NOTES 3 AND 4

NOTES:

1. THIS DRAWING SHALL BE INTERPRETED IN ACCORDANCE WITH APPLICABLE STANDARDS LISTED IN MIL SPEC DDD-D-1000.
2. THE FOLLOWING ARE MANDATORY WHEN INDICATED BY ■
  - ☐ REMOVE BURRS
  - ☐ BREAK SHARP EDGES .010 MAX
  - ☐ FILLETS .010 MAX R.
  - ☐ .001 V ALL OVER, EXCEPT AS NOTED
  - ☐ DIMENSIONS APPLY AFTER PLATING
  - ☐ TOLERANCES ON STOCK MATERIAL SIZES SHALL BE AS SPECIFIED IN APPLICABLE SPECIFICATIONS.
3. ATTACH ITEM 2 TO ITEM 1 WITH MARKING SPOT AGAINST ITEM 1.
4. CEMENT ITEM 2 TO ITEM 1 USING ITEM 3

SEE PARTS LIST PL5-15-8154

BS-8101	Z 03	UNLESS OTHERWISE SPECIFIED	ORIGINAL DATE: 8C-08-15	U.S. AIR FORCE RESEARCH AND DEVELOPMENT COMMAND
		DIMENSIONS ARE IN INCHES	DRAWN BY: FAS	CHECKED BY: WC
		TOLERANCES ON:	SUBMITTED BY: [Signature]	
		2 PLACE DECIMALS ±.01	REVIEWED BY: [Signature]	
		3 PLACE DECIMALS ±.005	APPROVED BY: [Signature]	
		FRACTIONS ± 1/16	DATE: 17 FEB 68	
		ANGLES ± 1°	SCALE: 2/1	
		INTERNAL	DAAK11-78-C-0040	
NEXT ASSY	CODE NO.	SOURCE & SCREEN ASSEMBLY		
APPLICATION		81361 B B5-15-8154		



[illegible]

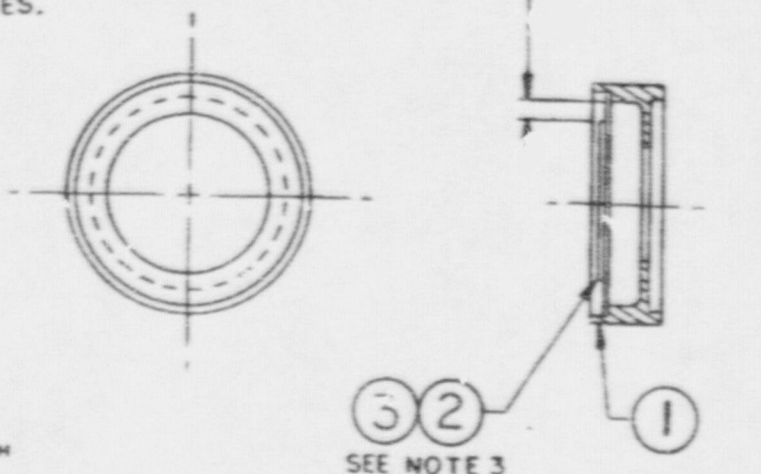
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NOTICE: THIS DRAWING IS FOR USE ONLY IN CONNECTION WITH PROCUREMENT BY THE UNITED STATES GOVERNMENT AND SHALL NOT BE USED FOR REPRODUCTION EITHER WHOLLY OR IN PART FOR ANY OTHER PURPOSE EXCEPT WHEN SPECIALLY AUTHORIZED.

FOR SUPPLEMENTARY QUALITY ASSURANCE  
PROVISIONS SEE SQAP 5-15-8101

REVISIONS			
LT#	DESCRIPTION	DATE	APPROVED

5. THE AMERICIUM FOIL SOURCE SHOULD BE WIPE TESTED USING STANDARD SCINTILLATION TECHNIQUES BEFORE ASSEMBLY INTO CELL. TOTAL REMOVABLE SURFACE CONTAMINATION SHOULD BE LESS THAN 5 NANOCURIES.



NOTES:

- THIS DRAWING SHALL BE INTERPRETED IN ACCORDANCE WITH APPLICABLE STANDARDS LISTED IN MIL SPEC D10 D1000.
- THE FOLLOWING ARE MANDATORY WHEN INDICATED BY ■
  - ☐ REMOVE BURRS ☐ BREAK SHARP EDGES .010 MAX
  - ☐ FILLETS .010 MAX R
  - ☐ 1" V ALL OVER, EXCEPT AS NOTED
  - ☐ DIMENSIONS APPLY AFTER PLATING
  - ☐ TOLERANCES ON STOCK MATERIAL SIZES SHALL BE AS SPECIFIED IN APPLICABLE SPECIFICATIONS.
- CEMENT ITEM 2 TO ITEM 1 USING ITEM 3.
- CAUTION - RADIOACTIVE MATERIAL - PROCESS AND HANDLE IN ACCORDANCE WITH CODE OF FEDERAL REGULATIONS CFR-10.

SEE PARTS LIST PL5-15-8101

05-15-8103	Z 03	UNLESS OTHERWISE SPECIFIED		ORIGINAL DATE 80-08-15	U.S. ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND	
		DIMENSIONS ARE IN INCHES		BY SKETCHES	CHEMICAL SYSTEMS LABORATORY	
		TOLERANCES ON:		DRAFTSMAN	CHECKER	OR LENDER
		2 PLACE DECIMALS ± .01		FAS	WC	
		3 PLACE DECIMALS ± .005		SUBMITTED		
		FRACTIONS ± 1/32		James A. Alap		
		HOLE ± .010		APPROVED		
		MATERIAL		Raymond L. Z. Alap		
NEXT ASSY	CODE NO.	APPROVED BY JAMES 80-08		CODE IDENT NO.		
APPLICATION		HONEYWELL INC		81361		
		ST. PETERSBURG, FLA		B		
				B5-15-8101		
				SCALE 2/1		
				DAAK11-78-C-0040		



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(a)ALTERNATE

REVISIONS			
LINE	DESCRIPTION	DATE	APPROVED
A	INC NOR 203-203-001	2 MAY 83	<i>[Signature]</i>

LIST OF MATERIALS

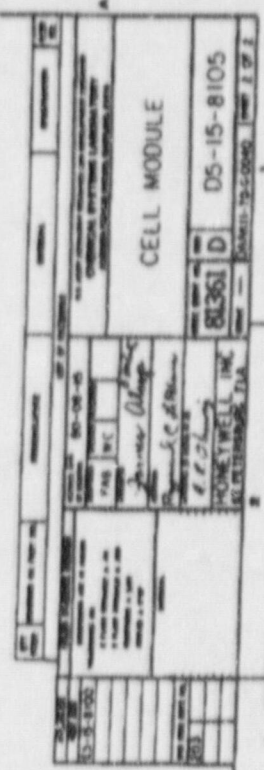
LINE	QTY	DRAWING OR PART NO.	REMARKS	MATERIAL	FSC M	SPECIFICATION	FORM NO.
1	---	BS-15-8101	SCREEN AND RETAINER ASSEMBLY				---
2							
3	1	BS-15-8056	RETAINER, SOURCE				1
4	1	BS-15-8154	SOURCE AND SCREEN ASSEMBLY				2
5	AR	ABLEBOND 163-4	CEMENT COND.EPOXY	(a)			3
6			ABLESTIK LABS				
7			833 WEST 182 <sup>ND</sup> ST				
8			GARDENA, CA 90248				
9	ALT	3026	E-SOLDER	(d)			4
10			ACME CHEMICAL		70103		
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DRAWING NO. 05-15-8101		APPROVED DATE 80-08-15		U.S. ARMY ARMAMENT RESEARCH AND DEVELOPMENT CENTER CHEMICAL SYSTEMS LABORATORY ADDRESS: PROVO, UTAH 84601	
DESIGNED BY <i>[Signature]</i>		CHECKED BY FAS WC		SCREEN AND RETAINER ASSEMBLY	
DRAWN BY <i>[Signature]</i>		APPROVED BY <i>[Signature]</i>			
PART CODE NO. 203		APPROVED BY <i>[Signature]</i>		CODE NO. 81361	
HONEYWELL INC ST PETERSBURG FLA		B PL5-15-8101		2/1 DAAK11-78-G-0040	

ENCLOSURE 2









		REVISIONS			
LTR		DESCRIPTION	DATE	APPROVED	
E		REPLACES PL5-15-B105 REV D, DATED 8 MAR 85 AND ADDS SHEET 2 OF 2 AND INC NCR ZOS-717-002	4 OCT 85	<i>[Signature]</i>	
F		NOR S9C3068-0002 89-04-18 NOR S9C3042-0001 89-04-06	89-10-02	<i>[Signature] R/S</i>	

WARNING: THIS DOCUMENT IS FOR USE ONLY IN CONNECTION WITH PROGRAMS OF THE UNITED STATES GOVERNMENT AND SHALL NOT BE USED FOR PROPRIETARY PURPOSES WITHOUT THE WRITTEN PERMISSION OF THE SECRETARY OF DEFENSE.

### PARTS LIST

LINE	CITY REQD	DRAWING OR PART NO.	NOMENCLATURE	MATERIAL	FSCM	SPECIFICATION	ITEM #
1	---	D5-15-B105	CELL MODULE				---
2							
3	1	D5-15-B081	CELL HOUSING, MACHINING				1
4	1	D5-15-B104	CELL SUBASSY				2
5	1	C5-15-B058	COVER, CELL				3
6							
7	1	C5-15-B424	DISC, LOCKING SUBASSY				5
8	2	5B04-74-1	WASHER, CRESENT STYLE SPRING	SEASTROM WPG CO.	B6928		6
9	1	B5-15-B068	TURNOLOCK FASTENER, CELL ASSY				7
10	1	B5-15-B176	LABEL, WARNING				8
11	1	B5-15-B177	LABEL, RADIOACTIVE MAT'L				9
12							
13	AR		SEALING COMPOUND, GRADE AA			MIL-S-22473	11
14							
15	4	MS24693-C2	SCREW, MACHINE, FLAT HEAD				
16			100° 4-40 X 1/4 LG	CRES			12
17	4	MS51957-13	SCREW, MACHINE, PAN HEAD				
18			4-40 X 1/4 LG, CROSS-RECESSED	CRES			13
19	1	SEI2XC05S	TERMINAL, TURRET	BRASS, TIN DIP		MIL-T-55155/12	14
20							
21	AR		FAB-ORG COAT LABELS				
22			BLACK ON CLEAR			MIL-STD-130	16
23	AR		PROTECTIVE COATING			FED-STD-141	17
24	AR		COMPOUND, RETAINING, GR B			MIL-S-22473	18
25	AR		SOLDER SN60 OR 63	SEE NOTE 8		QQ-S-571	19
26							
27							
28		DOM5-15-B105	DESCRIPTION OF MANUFACTURE				
29	1	C5-15-12600	LABEL, WIPE TEST				21
30	AR	GEI201	GLYPHAL RED ENAMEL		50293		22

APPLICATION	DESIGN OFFICE	U.S. ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND
HEAT ABST	BO-08-15	CHEMICAL SYSTEMS LABORATORY
E5-15-B100	REVIEWER F.A.S. CHECKER W.C.	ARMORY PROTEST GROUND, MARYLAND 21010
	SUBMITTED BY <i>[Signature]</i>	
	APPROVED BY <i>Ronald C. [Signature]</i>	
	APPROVED BY GROUP OF CR <i>[Signature]</i>	
END ITEM CODE NO. Z03		CODE EXIST? NO. SIZE 81361 B PL5-15-8105

### CELL MODULE

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# REVISIONS

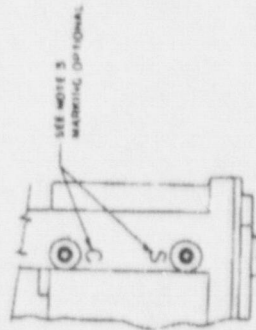
REV	DESCRIPTION	DATE	APPROVED

## PARTS LIST

LINE	QTY	DESCRIPTION OR PART NO.	NOMENCLATURE	INTERNAL	SPECIFICATION	ITEM NO.
1	1		LABEL, VOID CHROME,			
2			1/4 X 1 INCH LONG, IMPACT			
3			LABEL CO., 4612 W.			
4			BUFFALO AVE., TAMPA,			
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APPLICATION NEXT STEP		DESIGN NO. 80-08-15		U.S. ARMY AMMUNITION RESEARCH AND DEVELOPMENT COMMAND	
PL5-15-8105		APPROVED: M.A.B. WC		CHEMICAL SYSTEMS LABORATORY	
		DESIGNED: JAMES WILSON		ADDRESS: FORT MONROE, VIRGINIA 23060	
		DRAWN: R. C. BLANK		CELL MODULE	
AND ITEM CODE 203		APPROVED BY: R. C. BLANK		CODE IDENT NO. 81361	
				B PL5-15-8105	
				SHEET 2 OF 2	



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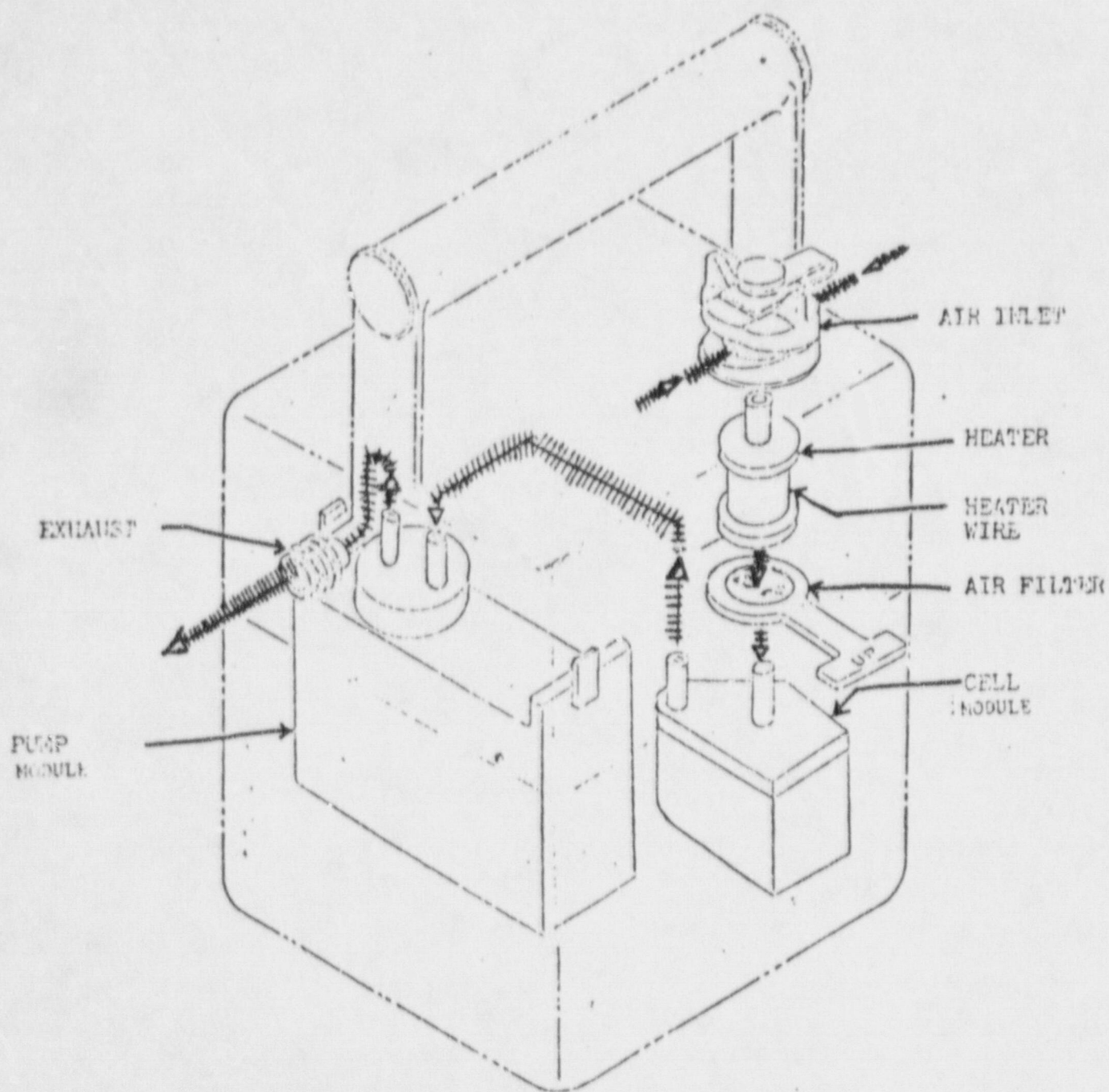
VIEW D—D  
ROTATED 90° CLOCKWISE  
SCALE: 2/1

LINE		CITY	ORIGINATING OR PART NO.	NOMENCLATURE	MATERIAL	FSM	SPECIFICATION	ITEM NO.
1	-	BS-15-8103	DETECTOR CELL ASSEMBLY					-
2								
3	1	BS-15-8003	BLACK AND INSERT ASSY					1
4	1	CS-15-8005	TUNE INLET					2
5	2	BS-15-8001	TERMINAL STUD					3
6								
7	1	BS-15-8101	SCREEN AND RETAINER ASSY					5
8	1	CS-15-8157	BAFFLE, CELL					6
9	8	BS-15-8156-1	SPACER, CELL					7
10	4	BS-15-8156-3	SPACER, CELL					8
11	4	BS-15-8156	BAFFLE, CELL					9
12	1	BS-15-8156-2	SPACER, CELL					10
13	1	BS-15-8002	SPACER, TAPPED					11
14	1	CS-15-8156-2	SCREEN, CELL					12
15	2	CS-15-8148-4	WASHER, NON-METALIC					13
16	1	AS-15-8164	TERMINAL, LUG	COPPER				14
17	1	CS-15-8102-20	TWIRING ASSEMBLY, PLASTIC					15
18	1	M63248/1-073	PACKING, PREFORMED				MIL-R-83248/1	16
19	1	M63248/1-080	PACKING, PREFORMED				MIL-R-83248/1	17
20	1	M551857-1	SCREW, PMM 2-56 X 1/8 LG	CRS				18
21	1	M53338-134	WASHER LOCK NO 2	CRS				19
22			PIRE UNINSULATOR, SOFT	(SOLID COPPER)			BS 8-343	20
23	AR		DRAWN AND ANNEALED, ANG 22	TIN PLATED			TYPE 3	
24	AR		SOLDER SN60 BR 40				DS-2-671	21
25	AR		PAB-ORG COAT LABELS, BLACK ON CLEAR				MIL-STD-130	22
26	AR		PROTECTIVE COAT				FED-STD-141	23
27	1	CS-15-8421	WASHER, SPRING TENSION					24
28	1	CS-15-8422	RING, RETAINER					25
29	AR	SM 2216	ADHESIVE			01963		26
30								

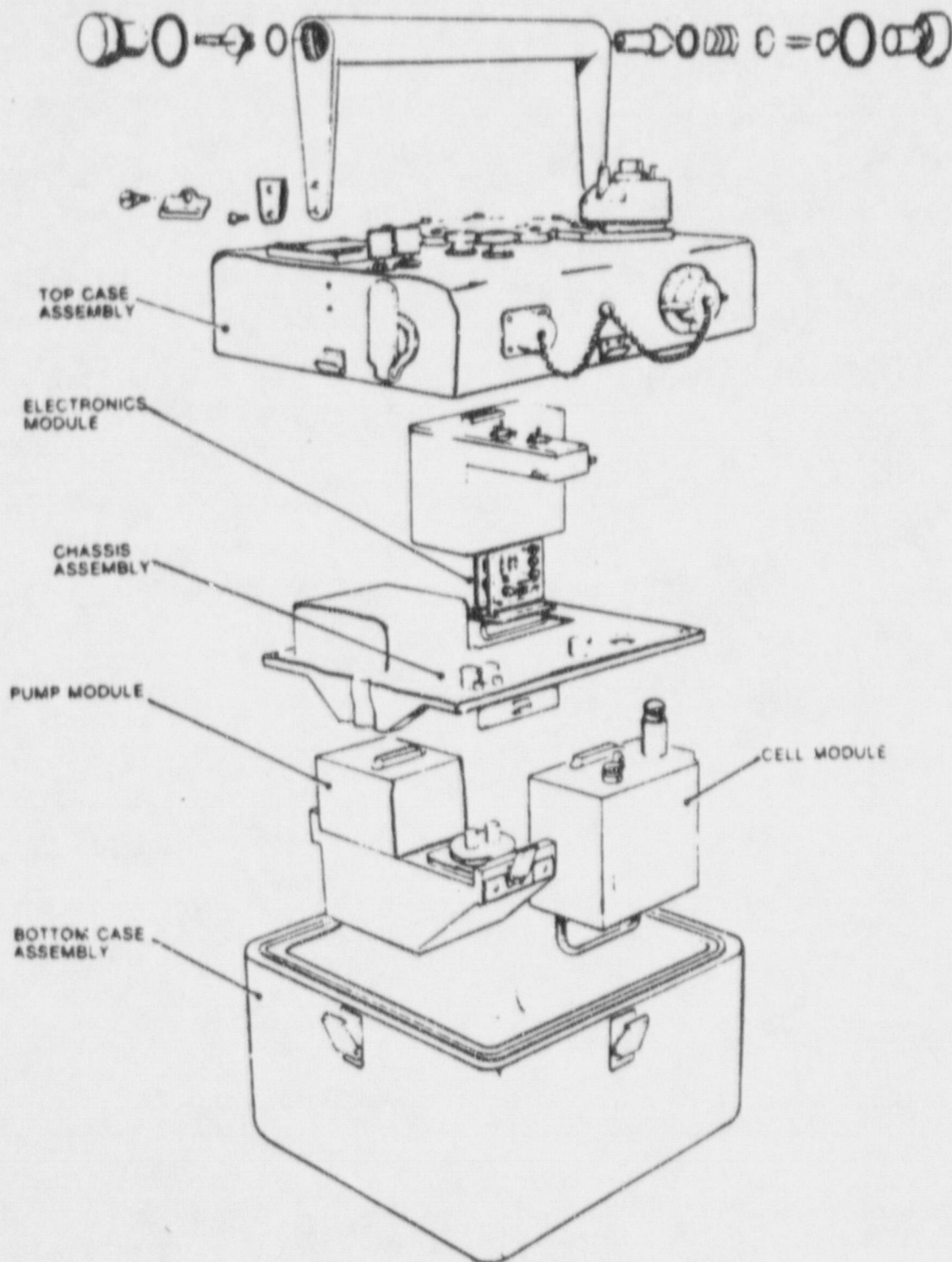
  

APPLICATION NEXT ASST	ISSUED, DATE OF REVISION	U.S. ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND CHEMICAL SYSTEMS LABORATORY ADDRESS PROVING GROUND, MARYLAND, 21010
05-45-8104	80-08-15	DETECTOR CELL ASSEMBLY
	DATE ERA WC	
	SUBMITTER James L. [Signature]	
	APPROVED [Signature]	
END ITEM CODE NO.	APPROVED BY, GRADES OF US	CODE AND NO.
203	A. L. [Signature]	81361
	HONEYWELL INC ST. PETERSBURG, FLA	B PL5-15-8103
		SCALE [Blank] (MIL-STD-130) / SHEET





M43E-1 PNEUMATIC PATH



Isometric Sketch of the M43A1 Detector Unit



Enclosure 3

### Wipe Test Results from Field Assets

The M43A1 Chemical Agent Alarm has been in the field since 1984. The cell module containing the Am-241 source disk cannot be opened and so it has not been possible to perform direct leakage tests on the disk itself. Instead the external surfaces of the cell module and the device have been wipe tested. In that time the wipe testing program has never shown any removable americium-241 on the areas that are accessible to users and maintainers of the device.

In 1992 the AMCCOM Safety office began receiving reports from maintenance activities of M43A1 Chemical Agent Detectors observed to have a "white powder" accumulating in the air path tubing. The observations were made during maintenance on the devices. In each instance the maintainers were instructed to treat the devices to be potentially leaking radioactive material and turn them in to the Army's central collection point at Anniston AL.

Wipe tests later showed that this white powder, contained detectable levels of Am-241. The highest result obtained from these samples was 0.00047 microcuries. Since no tests had ever exceeded minimum detectable levels these results were cause for concern.

Special studies were initiated to examine the integrity of the Am-241 sources given their 8-10 year age. These studies were performed by Battelle's Columbus Ohio Laboratory. In some cases the studies found measurable levels of removable americium-241 inside the cell module. In at one case the removable material within the cell module was 0.018 microcurie. The cell modules used in these studies already had been withdrawn from service and were disposed of as radioactive waste at the Barnwell, South Carolina site.

The Battelle study indicates that deterioration of the Am-241 source is being occurring. Due to the alpha particle bombardment of the micro-pores or micro-fractures are developing in the gold matrix. Micrographs of source disks showed discrete spots of silver from the source backing that had migrated through the gold layers to the surface. This was interpreted to be transport and deposition of dissolved silver through channels which develop due to alpha particle bombardment and recoil effects. Water vapor condensing in the fractures could be dissolving material and allowing it to be transported to the surface. The conclusion was that if silver was being transported to the surface of the source in this manner the same was occurring with americium.

Concern arising from this was that Am-241 might be escaping from the cell module. Thus a wipe test designed to look specifically at the air path at the outlet of the cell module was designed. The air path wipe tests have found low levels of free Am-241 in the plastic tubing between the cell module and the pump module. In the highest instance the level of activity was less than 200 dpm.



About 4% of the devices in the sample population of 500 detectors examined showed any removable activity. The levels found have varied between just above minimum detectable (3 dpm) to 180 dpm. We believe that the design of the cell module, through which air flows in a "U" shaped path from inlet to outlet, is functioning to trap most of the free Am-241 released from the source disk.

The cell module is never opened in any servicing procedure. Some maintenance procedures do call for removing and replacement of the cell module. We are, therefore, initiating a change to the wipe test procedure to be used in the field. The new test is designed to directly examine the air path tubing at the cell module outlet to detect removable Am-241. This can be done without any disassembly of the device beyond removal of the cell module.

Removal of the cell module is authorized at the support maintenance level. In this way we will be able to detect any migration of Am-241 from the cell module. Wipe test results showing removable Am-241 above 20 dpm will be considered a contaminated device and removed from service. This wipe test will be performed annually and prior to any maintenance bring performed on the device.

ENCLOSURE 4



1

Other authors suggest the effect may also arise in the "T-shaped" board. In a study with 30 men, Tversky and Kahneman (1983) showed how a "T-shaped" board, identical to a 300-dot board, was perceived as having 300 dots.

4612 W. PULFALO AVE  
TAMPA, FLA 33614

05-559105	703	ANALYST: [blank] DATE: [blank] TIME: [blank]	U.S. GOVERNMENT PRINTING OFFICE: 1964 CHEMICAL SYSTEMS LABORATORY ARMOEDEN PROJECT OFFICE, NEWARK, N.J. 07102
		ANALYST: [blank] DATE: [blank] TIME: [blank]	LABEL, RADIOACTIVE MAT'L.
		ANALYST: [blank] DATE: [blank] TIME: [blank]	
		ANALYST: [blank] DATE: [blank] TIME: [blank]	CODE IDENT NO.: 81361 DATE: B TIME: 815-8177
		ANALYST: [blank] DATE: [blank] TIME: [blank]	SCALE: 2/1 DATE: 11-7-64

SEE PARTS LIST 745-15-8096			
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st 32nd 33rd 34th 35th 36th 37th 38th 39th 40th 41st 42nd 43rd 44th 45th 46th 47th 48th 49th 50th 51st 52nd 53rd 54th 55th 56th 57th 58th 59th 60th 61st 62nd 63rd 64th 65th 66th 67th 68th 69th 70th 71st 72nd 73rd 74th 75th 76th 77th 78th 79th 80th 81st 82nd 83rd 84th 85th 86th 87th 88th 89th 90th 91st 92nd 93rd 94th 95th 96th 97th 98th 99th 100th 101st 102nd 103rd 104th 105th 106th 107th 108th 109th 110th 111th 112th 113th 114th 115th 116th 117th 118th 119th 120th 121st 122nd 123rd 124th 125th 126th 127th 128th 129th 130th 131st 132nd 133rd 134th 135th 136th 137th 138th 139th 140th 141st 142nd 143rd 144th 145th 146th 147th 148th 149th 150th 151st 152nd 153rd 154th 155th 156th 157th 158th 159th 160th 161st 162nd 163rd 164th 165th 166th 167th 168th 169th 170th 171st 172nd 173rd 174th 175th 176th 177th 178th 179th 180th 181st 182nd 183rd 184th 185th 186th 187th 188th 189th 190th 191st 192nd 193rd 194th 195th 196th 197th 198th 199th 200th 201st 202nd 203rd 204th 205th 206th 207th 208th 209th 210th 211st 212nd 213th 214th 215th 216th 217th 218th 219th 220th 221st 222nd 223rd 224th 225th 226th 227th 228th 229th 230th 231st 232nd 233rd 234th 235th 236th 237th 238th 239th 240th 241st 242nd 243rd 244th 245th 246th 247th 248th 249th 250th 251st 252nd 253rd 254th 255th 256th 257th 258th 259th 260th 261st 262nd 263rd 264th 265th 266th 267th 268th 269th 270th 271st 272nd 273rd 274th 275th 276th 277th 278th 279th 280th 281st 282nd 283rd 284th 285th 286th 287th 288th 289th 290th 291st 292nd 293rd 294th 295th 296th 297th 298th 299th 300th 301st 302nd 303rd 304th 305th 306th 307th 308th 309th 310th 311st 312nd 313th 314th 315th 316th 317th 318th 319th 320th 321st 322nd 323rd 324th 325th 326th 327th 328th 329th 330th 331st 332nd 333rd 334th 335th 336th 337th 338th 339th 340th 341st 342nd 343rd 344th 345th 346th 347th 348th 349th 350th 351st 352nd 353rd 354th 355th 356th 357th 358th 359th 360th 361st 362nd 363rd 364th 365th 366th 367th 368th 369th 370th 371st 372nd 373rd 374th 375th 376th 377th 378th 379th 380th 381st 382nd 383rd 384th 385th 386th 387th 388th 389th 390th 391st 392nd 393rd 394th 395th 396th 397th 398th 399th 400th 401st 402nd 403rd 404th 405th 406th 407th 408th 409th 410th 411st 412nd 413th 414th 415th 416th 417th 418th 419th 420th 421st 422nd 423rd 424th 425th 426th 427th 428th 429th 430th 431st 432nd 433rd 434th 435th 436th 437th 438th 439th 440th 441st 442nd 443rd 444th 445th 446th 447th 448th 449th 450th 451st 452nd 453rd 454th 455th 456th 457th 458th 459th 460th 461st 462nd 			



Enclosure 5

## RESUME OF TRAINING AND EXPERIENCE

John A. Mattila

### 1. Educational Background:

Purdue University - BSME Mechanical Engineering 1956-1960  
University of Iowa - Graduate Studies  
Intermediate Thermodynamics (3 sem hrs) 1964  
Differential Equations (3 sem hrs) 1965

### 2. Formal Training in Radiation Protection:

Radiation Protection Officer (RPO) Course (1 week) 1-5 Aug 94  
Given by U.S. Army Communications-Electronics  
Command (CECOM) at Phoenix, AZ

Conventional Ammunition Radiation Training 12-23 Sep 94  
(CART) (2 weeks)  
Given by U.S. Army Defense Ammunition  
Center & School (USADACS) at Savanna, IL

### 3. Experience Background:

Weapons design and project engineer, Feb 64 - Dec 67  
research and development (R&D) artillery  
and aircraft weapons.  
Rock Island Arsenal (RIA), Rock Island, IL

Reliability, Availability, and Jan 68 - Jan 74  
Maintainability (RAM) engineer team leader,  
R&D and production artillery, aircraft weapons,  
and small arms.  
RIA, Army Weapons Command, and Rodman Laboratory,  
Rock Island, IL

RAM and process quality engineer team leader Feb 74 - Apr 94  
and branch chief production aircraft weapons,  
small arms, air defense, fighting vehicles,  
related ammunition, and defensive chemical  
equipment. Army Armament Command (ARMCOM)/  
Armament Readiness Command (ARRCOM)/Armament,  
Munitions & Chemical Command (AMCCOM),  
Rock Island, IL



3. Experience Background: (continued)

Temporary detail of 120 days to Logistic Engineering & Maintenance Directorate, co-located in AMCCOM Safety Office to provide introduction/experience to Radiation Safety Program. Detail is in preparation for future assignment as Chief of Armament and Chemical Acquisition Logistic Activity (ACALA) Safety Office. Duties will include designation as License Manager for ACALA Radiation Licenses on transfer from AMCCOM, Rock Island, IL. May 94 - Sep 94

Chief of ACALA Safety Office on production weapons and defensive chemical equipment. Oversees management of ACALA Radiation License actions, Radiation Safety Program, Army Radiation Authorizations, System Safety Engineering Program and Safety-of-Use Message Program. Oct 94 - Present

# RESUME OF TRAINING AND EXPERIENCE

ELIZABETH A PETERSON

Radiation Protection Officer for Licenses 12-00722-04, 12-00722-06, and SUC1340, XB001141 and Alternate Radiation Protection Officer for Licenses 12-00722-13 and 12-00722-14.

## 1. GENERAL EDUCATION BACKGROUND:

Bachelor of Science in Chemistry (1964), minors math and physics. Mary Washington College of the University of Virginia, Fredericksburg, Virginia

Graduate work, Inorganic chemistry (1964-66)  
Oklahoma State University, Stillwater, Oklahoma

## 2. FORMAL TRAINING IN RADIATION SAFETY:

### A. Principles and Practices of Radiation Protection.

<u>Course</u>	<u>Duration of Training</u>	<u>Completion</u>
Radiological Safety Fundamentals 133 Correspondence Course Aberdeen, MD	13 credit hours	Sept 1975
Radiological Safety 7K-F3 Aberdeen, MD	120 hours	Oct 1975
Laser Safety Field safety Activity Charlestown, IN	24 hours	Oct 1980
Nuclear Accident/Incident Control Operations and Planning Defense Ammo Center & School Savanna, IL	80 hours	Dec 1980
Radioactive Waste Disposal Work Shop US Ecology Inc Rock Island, IL	16 hours	March 1981
Applied Health Physics Oak Ridge Assoc Universities Oak Ridge, TN	200 hours	Jun 1983
Depleted Uranium Safety course Battelle PNL US Army Belvoir Research and Development Center Fort Belvoir, VA	40 hours	Mar 1984
Basic Radiation Protection and Tritium Illumination Devices, Allied Tech Group, Inc	24 hours	Aug 1994



Atlanta, GA

B. Radioactivity Monitoring Techniques and Instruments:

<u>Course</u>	<u>Duration of Training</u>	<u>Completion</u>
Alpha, Beta, Gamma, and Liquid scintillation Counting Rock Island Arsenal Rock Island, IL	1966-77 (on the job)	1977
Applied Health Physics Oak Ridge Assoc U. Oak Ridge, TN	200 hours	Jun 1993

C. Mathematics and Calculations:

<u>Course</u>	<u>Duration of Training</u>	<u>Completion</u>
Shielding, Decay Calculations	1966-78 (on the job)	1978
Applied Health Physics	200 hours	Jun 1983

D. Biological Effects of Radiation.

<u>Course</u>	<u>Duration of Training</u>	<u>Completion</u>
Radiological Safety 7K-F3	120 hours	Oct 1975
Applied Health Physics	200 hours	Jun 1983
Radiation Emergency Response Radiation Management Corp. US Army Belvoir Research and Development Center Ft Belvoir, VA	40 hours	Jan 1984

3. EXPERIENCE WITH RADIOISOTOPES:

<u>Isotope</u>	<u>Max. Activity</u>	<u>Duration of Experience</u>	<u>Type of Experience</u>
Co60	120 Ci	6 years	leak test, irradiation experiments
Pm147	1mCi	3 years	leak tests of sealed sources, tracer studies
Po210	180mCi	5 years	leak test of sealed sources
H3	10 Ci	10 years	leak test sealed sources, inventory, lab analyses

### 3. EXPERIENCE WITH RADIOISOTOPES:

<u>Isotope</u>	<u>Max. Activity</u>	<u>Duration of Experience</u>	<u>Type of Experience</u>
S35	10mCi	4 years	tracer studies
Sr90	10mCi	4 years	tracer studies
Mo99	10mCi	4 years	tracer studies

### 4. EXPERIENCE WITH OTHER RADIATION PRODUCING MACHINES:

<u>Instrument</u>	<u>Duration of Experience</u>	<u>Completion</u>
X-ray Diffraction Spectrometer	10 years	1977
X-ray Fluorescence Spectrometer	10 years	1977
Scanning Electron Microscope with energy and wave length dispersive spectrometers	5 years	1980

### 5. GENERAL RADIATION WORK BACKGROUND:

a. Was employed by Rock Island Arsenal at Rock Island, IL from 1966-1980 and assigned to the Materials Evaluation Branch of the Engineering Directorate. Conducted tracer analyses, leak tests, surveys, and calibrations of various types of radiation detection equipment.

b. Was employed as a health physicist for Headquarters, US Army Armament, Munitions and Chemical Command (HQ, AMCCOM) at Rock Island from 1980-1986. Duties included working as alternate AMCCOM RPO, advising the Commanding General on radiological safety matters, preparing NRC licenses, and DA authorizations for radioactive items of issue managed by AMCCOM, conducting inspections of radiation safety programs at Army ammunition plants, and conducting inspections of compliance to NRC license requirements at user and storage locations.

c. Am currently again employed as a health physicist for the Armament and Chemical Acquisition and Logistics Activity at Rock Island since Feb 1993. Duties include working as ACALA RPO, advising the Commanding General on radiological safety matters, preparing NRC licenses for radioactive items of issue managed by ACALA, conducting inspections of radiation safety programs for compliance to NRC license requirements at user and storage locations.

**Resume of Training and Experience**  
**Jeffrey A. Havenner**

**ACALA Health Physicist**

**1. General Educational Background:**

Bachelor of Science, 1973, University of Maryland,  
College Park, Md. Major: Microbiology

Master of Science, 1976, University of Maryland,  
College Park, Md. Major: Microbiology, Emphasis in Cell  
Physiology and Biochemistry

**2. Training in Radiation Safety**

a. 1977-1978 Laboratory Technician, Litton Bionetics Inc,  
Fredrick Cancer Research Center. Training in radiation safety  
practices and procedures in handling, accounting for and proper  
disposal of radioisotopes used in biomolecular research projects.

b. 1979-1982 Microbiologist, U.S. Army Walter Reed Army  
Institute of Research, Department of Rickettsial Diseases.  
Training in radiation safety practices and procedures in handling,  
accounting for and proper disposal of radioisotopes. Training in  
the use of cobalt-60 cell irradiation equipment.

c. 1982 U.S. Army Radiological Safety Course (7KF3) at the  
U.S. Army Chemical School, Ft. McClellan AL. (Duration 3 weeks)

d. 1991 Depleted Uranium/Heavy Metals, U.S. Army Armaments  
Research, Development and Engineering Center, Dover N.J. Course  
covered manufacture, characteristics and handling of depleted  
uranium materials. (duration 1 week)

e. 1992 Low Level Radioactive Waste Packaging and  
Transportation Course, U.S. Ecology Inc, Las Vegas Nevada.

f. 1992 Site Safety Training, Department of Energy, Fernald  
Environmental Management Program, Fernald, OH. (Duration 2 weeks)  
Training in use of monitoring and survey equipment, personal  
protective equipment and emergency response to accidental releases  
of radioactive material and criticality emergencies.

**3. Experience with Radionuclides**

a) 1974-1976 Department of Microbiology, University of  
Maryland, College Park, MD. Research involving bacterial uptake  
and metabolism of carbon-14 and tritium labeled amino acid and  
vitamin preparations. Work involved calculation of specific  
activity, scintillation counting procedures, inventory procedures,  
safe storage, handling and disposal techniques as well as  
performing surveys of work areas.



b) 1977-1978 Litton Bionetics, Fredrick Cancer Research Center, Division of Viral Oncology, Fort Detrick, Md. Used carbon-14, tritium and phosphorus-32 labeled nucleotide preparations in DNA and RNA sequencing and virus genome isolation procedures. Work involved calculations of specific activity, scintillation counting procedures, inventory procedures, safe storage, handling and disposal techniques as well as performing surveys of work areas.

c) 1979-1982 Walter Reed Army Institute of Research, Walter Reed Army Medical Center, Washington, D.C. Used a cobalt-60 cell irradiator to inhibit reproduction of viable cell populations for the purpose of cultivating rickettsia. Used preparations of carbon-14 and tritium labeled amino acids in vivo in mice to detect immune response to rickettsial infections and isolate labeled antisera to rickettsial strains.

d) 1983 U.S. Army, Chemical Staff Officer, 3rd Armored Division Headquarters. Participated in emergency response to and environmental clean up of one of the first tank fires involving up loaded depleted uranium ammunition.

e) 1988-1991 U.S. Army Armament Munitions and Chemical Command, Chemical Equipment Branch, Rock Island, IL. Americium-241, Weapon System Manager of the M43A1 Chemical Agent Detector fielding program and the for the Advanced Chemical Agent Detector which incorporated a nickel-63 source.

#### 4. General Health Physics Background

a) 1991-1992 U.S. Army Armament Munitions and Chemical Command, Safety Office, Rock Island, IL. Health Physicist, Worked on licensing and radiation safety issues involving the Army's war reserve depleted uranium (U-238) ammunition stock pile manufacturing, maintenance and storage.

b) 1992-1994 U.S. Army Armament Munitions and Chemical Command, Radioactive Waste Disposal Office, Rock Island, IL. Health Physicist. Developed and executed radioactive waste packaging, transportation and disposal projects including large scale remediation and decontamination projects.

c) 1994-present U.S. Army Armament Munitions and Chemical Command, Safety Office, Rock Island, IL. Health Physicist for licensing and radiation safety issues involving tritium, americium-241 and nickel-63 sources in NRC licensed Army commodities.

**RESUME OF TRAINING AND EXPERIENCE**  
**GAVIN ZIEGLER**

GENERAL EDUCATION BACKGROUND: Bachelor of Science in Engineering Mechanics (1986), Southern Illinois University, Carbondale, Illinois

FORMAL TRAINING IN RADIATION SAFETY:

- A. Principles and Practices of Radiation Protection.
- B. Radioactivity Monitoring Techniques and Instruments.
- C. Mathematics and Calculations.
- D. Biological Effects of Radiation.

<u>Category</u>	<u>Course</u>	<u>Duration</u>
C	Calculus, Physics, and other math courses. Southern Illinois University, Carbondale, Illinois	30 hrs (1982-86)
A B C D	Radiological Safety I - Fundamentals U.S Army Training Support Center, Newport News, Virginia	13 hrs (1990)
A B C D	Radiological Protection Management Course Field Safety Activity, Charlestown, Indiana	24 hrs (1990)
A B C D	Radiological Safety Course U.S. Army Chemical School, Fort McClellan, Alabama	120 hrs (1990)
A B C D	Radioactive Waste Guidance Chem Nuclear Systems, Inc., Columbia, South Carolina	40 hrs (1990)
C D	Radiological Bioassay and Dosimetry Software Training Fort Belvoir, Virginia	40 hrs (1992)

GENERAL DUTIES: Health Physicist for Headquarters, U.S. Army Armament, Munitions and Chemical Command, October 1990 to present. Duties include:

Assist in preparation of Nuclear Regulatory Commission (NRC) licenses and amendments and Department of the Army (DA) authorizations held by the command.

Reviews applications submitted by subordinate installations.

Assess installation radiation safety programs and compliance with AMCCOM NRC license requirements.

Assist in the performance of assigned inspections.

Provide response to special problems, questions, and directions.



ITEM 8, NRC FORM 313  
TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED  
AREAS

There is no use of the M7 and M8 sources. Therefore, there are no training requirements.

ITEM 9, NRC FORM 313  
FACILITIES AND EQUIPMENT

There is no use of the M7 and M8 sources. Therefore, there are no facilities and equipment requirements.

ITEM 10, NRC FORM 313  
RADIATION SAFETY PROGRAM

The M7 and M8 radioactive sources are obsolete and have been repeatedly recalled from use. Attached are the recall documents.

ITEM 11, NRC FORM 313  
WASTE MANAGEMENT

The only radioactive waste associated with this license is the 13 M8 sources in storage at Richland Washington. As soon as preparations can be made for disposal, disposal will occur. Once disposal is accomplished, a request for termination of the license will be requested.



Enclosure 6

### Record of Environmental Consideration

1. **PROJECT TITLE:** Renewal of Nuclear Regulatory Commission License BML 12-00722-13.
2. **BRIEF DESCRIPTION:** Renewal of License BML 12-00722-13 is required for continued use and possession of the M43A1 chemical agent detector. The M43A1 contains a 250 microcurie americium-241 source.
3. **ANTICIPATED DATE AND/OR DURATION OF PROPOSED ACTION:** Mar 95 to Mar 2000.
4. **REASON FOR USING RECORD OF ENVIRONMENTAL CONSIDERATION:** Is categorically excluded under the provisions of CX number 6, AR 200-2 Appendix A, (and no extraordinary circumstances exist as defined in AR 200-2, Paragraph 4-3), because these items are manufactured items.

Signed

*John Mattila*  
JOHN MATTILA  
Director, ACALA Safety Office

Date

2-06-95

Signed

*Robert J. Radkiewicz*  
HQ, AMCCOM, Environmental Coordinator

Date

2-23-95

*RAF*  
*15 Feb 95*

398220



MAR 03 1995

Department of the Army  
U.S. Army Armament and Chemical  
Acquisition and Logistics ACTI  
ATTN: AMSTA-AC-SF  
Elizabeth Peterson  
Alternative RSO  
Rock Island, IL 61299-7630

SUBJECT: LICENSE RENEWAL APPLICATION

Dear Ms. Peterson:

This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Original Signed By  
Marianne Meenan, Chief  
Nuclear Materials Support Section

License No. 12-00722-13  
Control No. 398220

DOCUMENT NAME: M:\03021073

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure  
"N" = No copy

OFFICE	DRSS/RIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NAME	MMEENAN:brt <i>mm</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DATE	03/3 /95	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OFFICIAL RECORD COPY