

Lth 28345

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

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

APPLICATION FOR MATERIAL LICENSE

030-30989

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

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20556

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

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

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

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

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

IF YOU ARE LOCATED IN:

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

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

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

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

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

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

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

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

- A. NEW LICENSE
- B. AMENDMENT TO LICENSE NUMBER _____
- C. RENEWAL OF LICENSE NUMBER _____

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

Inframetrics, Inc.
16 Esquire Road
Billerica, MA 01862

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

Inframetrics, Inc.
16 Esquire Road
Billerica, MA 01862

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

J.T. Dasse

TELEPHONE NUMBER

(508)670-5555

SUBMIT ITEMS 5 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.

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

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

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

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

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

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

FEE CATEGORY 3P AMOUNT ENCLOSED \$ 300.00

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

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

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE-CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

Yona Wieder

Yona Wieder

V.P. Military Programs 2/3/89

9002050202 890217
REG1 LIC30
20-28345-01 PDR

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
APP	Feb. 14	3P		<i>D. Kimbly</i>
\$300	CHECK NUMBER	(870) refunded		DATE
	11694			2/23/89

OFFICIAL RECORD COPY MI 10

FEB 06 1989

Item 5

- a. Americium 241
- b. A 250 uci; Americium 241 foil disc is assembled as part of a Detector Unit, Chemical Agent Automatic Alarm: M43A1 as shown in the family tree for the device (Attachment 1). The M43A1 meets the requirements of EA-D-1242B (Attachment 2), and is packaged in accordance with Special Packaging Instructions P5-15-8100 (Attachment 3). This is the physical form Inframetrics will receive and transfer to Environmental Technologies Group, Inc. Baltimore, Maryland.
- c. The maximum amount which will be possessed is 6 packaged M43A1 Detector Units, or less than 2 mci.

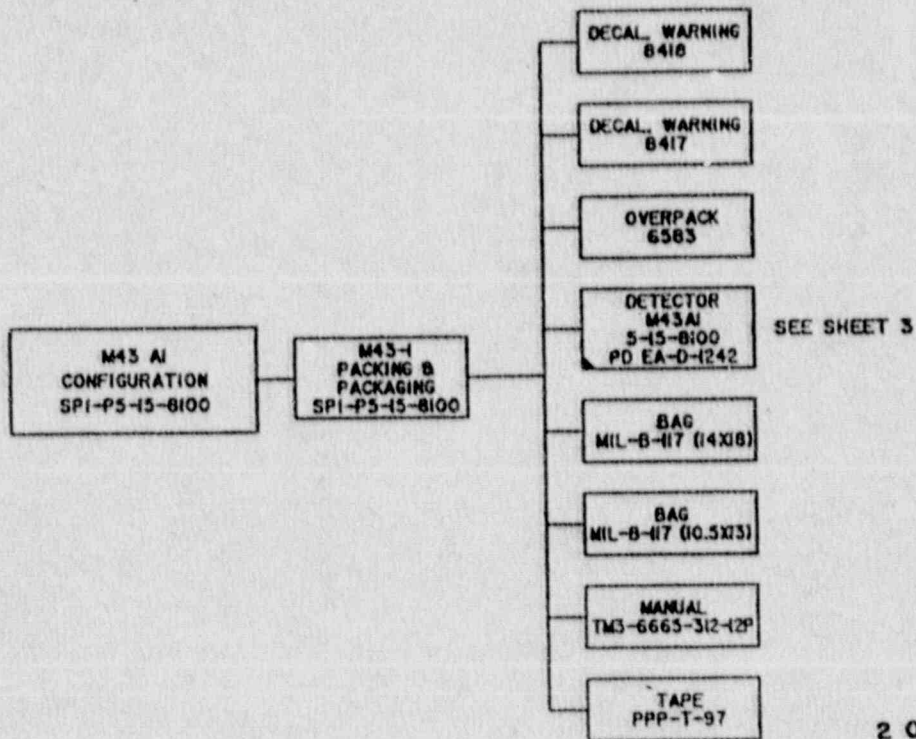
Item 6

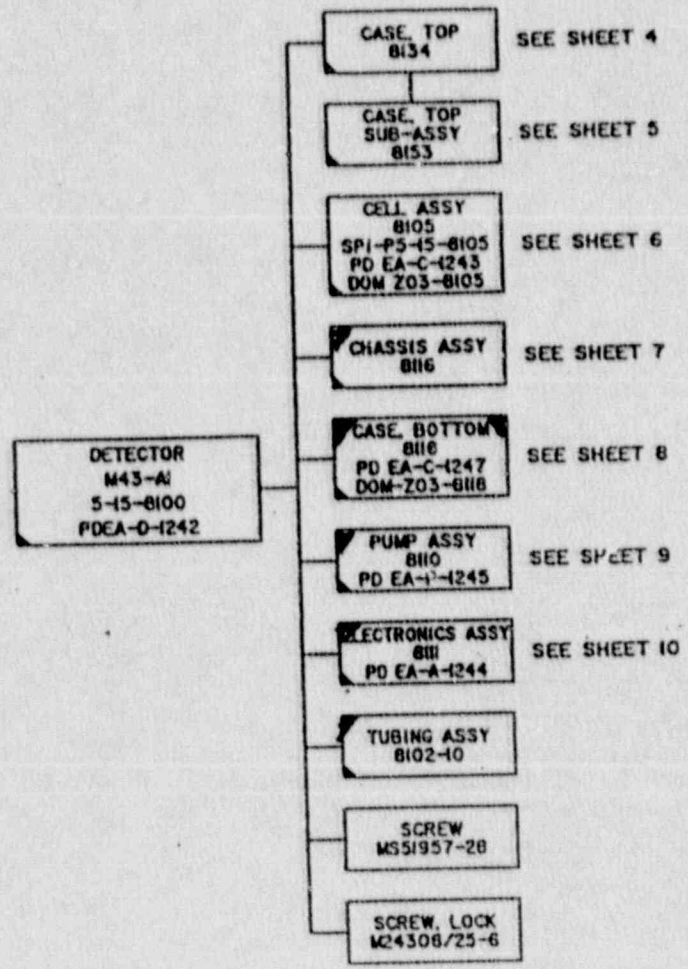
The license will be used to transfer 6 U.S. Government owned packaged M43A1 Detector Units from storage facilities at the U.S. Army Armament, Munitions and Chemical Command, (AMCCOM) Rock Island Arsenal, Rock Island, Illinois to Environmental Technologies Group, Inc. to be used as an aide in the development of Test Equipment for use under AMCCOM Contract DAAA09-88-C-1066. Environmental Technologies Group, Inc. (ETG) Baltimore, MD possesses a valid material license no. MD-05-012-01 issued by the State of Maryland (Attachment 4). Inframetrics will not open the packaged M43A1 Detector Units, but will forward the units immediately to ETG, Baltimore, MD.

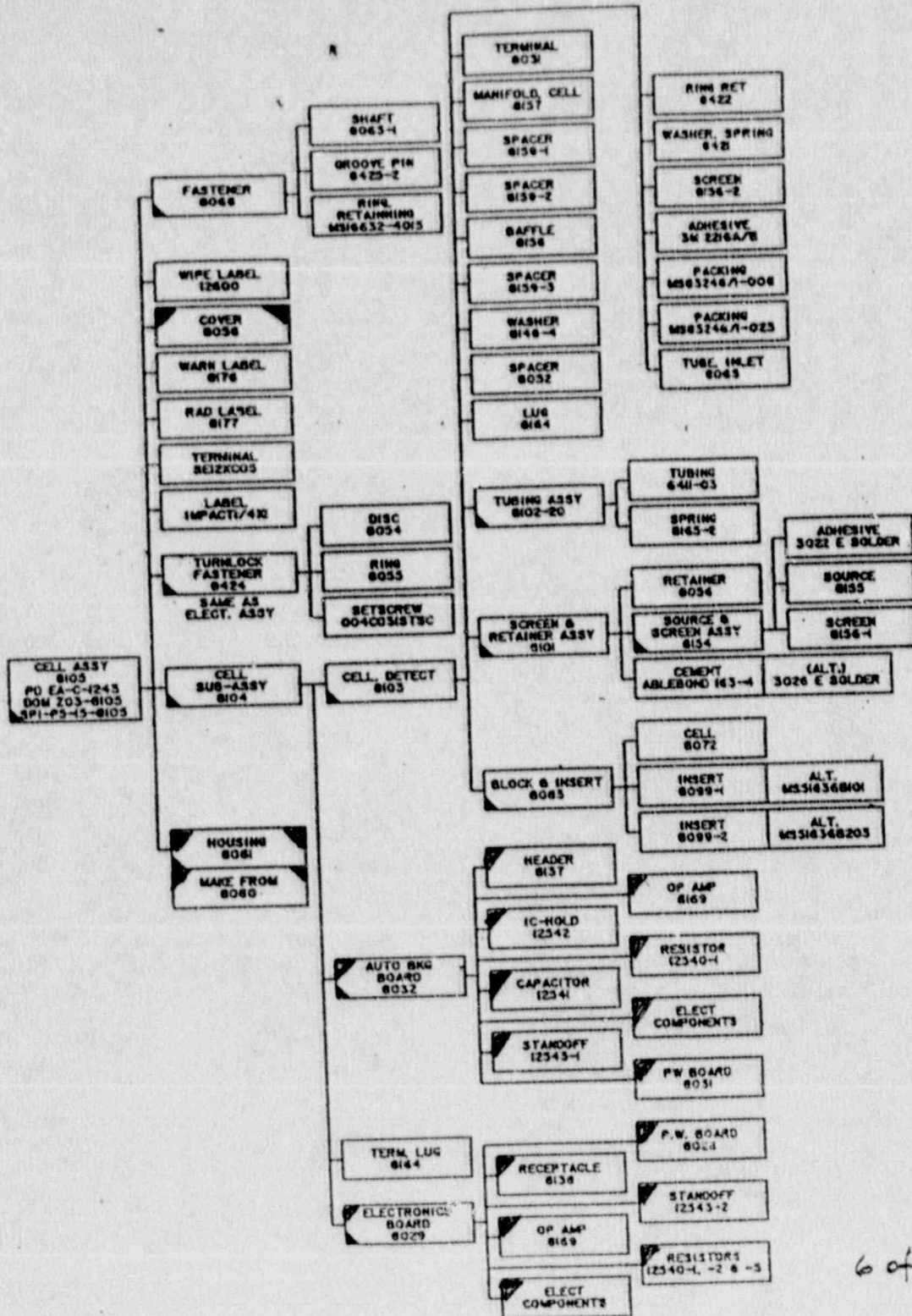
Item 7, 8, 9, 10 and 11

The transfer of the 6 M43A1 Detector Units containing a total of less than 2 mci will be accomplished only once and the packaged unit integrity will not be disturbed.

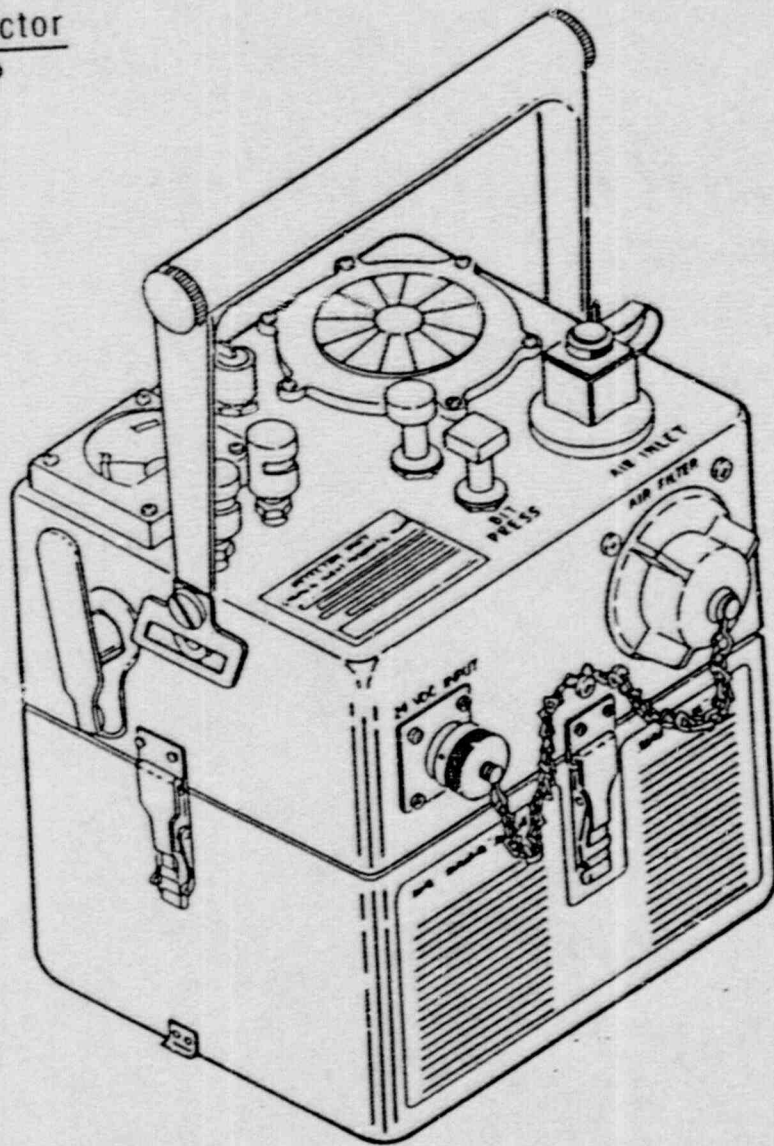
- 7 J.T. Dasse is responsible for the Radiation Safety and the physical security for this one time transfer. The units will have been wipe tested prior to packaging to assure no radiation leakage exists. The packaging will not be disturbed.
- 8 Cautious handling of the packaged units will be exercised with the unloading and reloading of the carrier vehicles. If transfer is not effected the same day, the units will be secured in the locked Government property area until transfer the next day.
- 9 Inframetrics shipping/receiving facilities will be utilized, and cautious handling procedures enforced.







M43A1 Detector
UNPACKAGED



Automatically detects nerve agents in the air. Will sound an alarm and send a signal to connected M42 Alarm.

UNLESS OTHERWISE SPECIFIED, DIMENSIONS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A SEPARATELY RELATED GOVERNMENT PROCUREMENT OPERATION. THE UNITED STATES GOVERNMENT THEREBY DISCLAIMS RESPONSIBILITY FOR ANY DELAY, INJURY, LOSS, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, PLANNED, OR ADVISED SUPPLYING THE SAID DIMENSIONS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE CONSIDERED AS IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSES THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYS ANY RIGHTS THAT MAY IN ANY WAY BE RELATED THERE TO.

UNLESS THIS DRAWING IS FOR USE ONLY IN CONNECTION WITH PROCUREMENT BY THE UNITED STATES GOVERNMENT AND SHALL NOT BE USED NOR REPRODUCED EITHER WHOLLY OR IN PART FOR ANY OTHER PURPOSE EXCEPT WHEN SPECIFICALLY AUTHORIZED.

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
A	M43AI WAS M43E1	17 FEB 81	<i>[Signature]</i>
B	NCR Z03-412-003 INC	25 JUN 84	<i>[Signature]</i>

LIST OF MATERIALS

LINE	QTY REQD	DRAWING OR PART NO.	NOMENCLATURE	MATERIAL	SPECIFICATION	ITEM NO.
1	---	E5-15-8100	DETECTOR UNIT CHEMICAL AGENT AUTOMATIC			---
2			M43AI			
3						
4	1	D5-15-8134	TOP CASE ASSY			1
5	1	D5-15-8118	BOTTOM CASE ASSY			2
6	1	E5-15-8116	CHASSIS ASSY			3
7	1	D5-15-8105	CELL MODULE			4
8	1	D5-15-8111	ELECTRONICS MODULE			5
9	1	D5-15-8110	PUMP MODULE			6
10	1	C5-15-8102-10	TUBING ASSEMBLY, PLASTIC			7
11	2	M24308/25-6	SCREW-LOCK ASSY, MALE		MIL-C-24308/25	9
12	4	MS51957-28	SCREW, MACHINE, PAN HEAD	CRES		10
13			6-32 X 3/8 LG UNC-2A			
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

APPLICATION NEXT ASSY EA-D-1242		ORIGINAL DATE OF DRAWING 80-08-15	U.S. ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND CHEMICAL SYSTEMS LABORATORY AMSCROSS PRODUCE GROUP, BANGOR, 21010	
		DIVISION E.R.A.	CHECKER WC.	
		SUBMITTED <i>[Signature]</i> APPROVED <i>[Signature]</i>		
		DETECTOR UNIT, CHEMICAL AGENT AUTOMATIC ALARM: M43AI		
END ITEM CODE NO. Z03	APPROVED BY ORDER OF <i>[Signature]</i>		CODE IDENT NO. 81361	QTY B PL5-15-8100
HONEYWELL, INC ST PETERSBURG, FLA		SCALE 1:1		DRW. NO. DA AK 11-76-C-0040

DRAWING 44-131-3000-4

EA-D-1242B
AMENDMENT 2
13 November 1987
SUPERSEDING
AMENDMENT 1
5 March 1987

CHEMICAL RESEARCH, DEVELOPMENT AND ENGINEERING CENTER PURCHASE DESCRIPTION

DETECTOR UNIT, CHEMICAL AGENT AUTOMATIC ALARM: M43A1

This amendment forms a part of Chemical Research, Development and Engineering Center (formerly Chemical Research and Development Center) Purchase Description EA-D-1242B, dated 7 March 1986.

PAGE 1

2.1:

Delete from FEDERAL SPECIFICATIONS, the following:

"QQ-S-781" and title.
"PPP-B-601" and title.
"PPP-B-621" and title.
"PPP-B-636" and title.

Delete from MILITARY STANDARDS, "MIL-STD-129" and title.

PAGE 2

2.1.2:

Delete from DRAWING list, the following:

"5-15-6564-21" and title.
"5-15-8193" and title.

Add to DRAWINGS, the following:

"P5-15-8100 - Special Packaging Instructions (SPI) for Detector Unit,
Chemical Agent, Automatic Alarm: ABCA-M43A1".

PAGE 9

3.11(b)(3): Delete in its entirety.

3.11(b)(4): Delete in its entirety.

FSC 6665

3.11:

At the end of 3.11 before "Upon completion of the reliability test . . .", add: "During the reliability test, the detector summing amplifier output (1A5J10-10 wrt 1A5J10-7) shall be 5 ± 0.50 V dc."

After "Upon completion . . . of Sensitivity and Radiation" add "(4.4.4.14.5)."

3.13, line 4: Change from "...Radiation, and Detector leakage when tested..." to "...and Radiation when tested..."

PAGE 12

4.3.1: Add the following to the end of text: "Three detectors shall be taken randomly from this sample and unit packed in accordance with SPL P5-15-8100."

4.3.2 title: Delete "4.3.2 Inspection procedures for examination and test." and substitute in lieu thereof "4.3.2.1 For examination and test."

Insert in sequence, "4.3.2 Inspection procedures."

Add new paragraph as follows:

"4.3.2.2 For destructive test. Prior to unit packing the three detectors, the two polystyrene containers (Drawing 5-15-6583) shall be tested as specified in 4.4.4.18. The acceptance number is zero."

PAGE 15

4.4.2.1: Change title to read as follows: "For examination and non-destructive test."

Add new paragraph as follows:

"4.4.2.2 For destructive test. Prior to unit packing, the polystyrene containers (Drawing 5-15-6583) shall be sampled in accordance with MIL-STD-105, level S-1 at the specified AQL."

4.4.3.2:

Change title to read "For non-destructive test."

EA-D-1242B
AMENDMENT 2

Change ". . . and the following figures of MIL-STD-781, MTBS figure C12, MTBFA figure C14, and MTBF figure C14 . . ." to ". . . and the following figure of MIL-STD-781, MTBS, MTBFA, and MTBF, figure C10 . . ."

Change paragraph "4.4.3.4" to "4.4.3.5".

Change paragraph "4.4.3.3" to "4.4.3.4".

Add new paragraph as follows:

"4.4.3.3 For destructive tests. Samples of polystyrene containers (Drawing 5-15-6583) shall be tested as specified in 4.4.4.18. The acceptance/rejection criteria shall be at an AQL of 2.5 percent defective."

PAGE 16

4.4.3.5(b) (formerly 4.4.3.4(b)), Major 104: After "AQL 2.5 percent defective", add "(Inspection Level S-1)".

PAGE 17

4.4.4.8: Change ". . . and start timer. Record the summing amplifier output at 2 minutes and peak voltage within 5 minutes. When the detector horn sounds, stop the timer, disconnect the detector from the DMMP source, depress the detector reset switch and record the elapsed time indicated by the timer." to ". . . and start timer. When the detector horn sounds, stop the timer and switch the summing amplifier auto background to "off". Monitor the summing amplifier output voltage for a period of 5 minutes from the time of connection to DMMP. Record time to alarm and peak voltage reached."

PAGE 19

4.4.4.14.5 Corrective action: Add the following "Detector that exhibits summing amplifier (1A5J10-10 wrt 1A5J10-7) voltage outside the range of 5 ± 0.50 V dc, or baseline with auto background, zeroed after reliability outside of 5 ± 0.50 V dc or peak voltages exceeding 14 V dc in the sensitivity test after the reliability chamber, will not be scored as reliability stoppages but shall be removed from the test lot and reworked as required. No individual unit shall be cycled through the reliability chamber more than two times."

Add new paragraph as follows:

"4.4.4.18 Moisture content. Prior to unit packing as specified on SPI P5-15-8100, determine the moisture content of the polystyrene container (Drawing 5-15-6583) in accordance with MIL-P-60312, except that the sampling and acceptance/rejection criteria shall be as specified herein."

Section 5: Delete in its entirety and substitute new section 5 as follows:

"5. PACKAGING

5.1 Packaging. Packaging requirements shall be as specified on SPI P5-15-8100.

5.2 Repair/replacement parts. When applicable components of the detector unit are procured for storage and issue as a repair or replacement part, preservation, unit packing, packing and marking shall be as specified on the applicable Special Packaging Instructions (SPI) or Packaging Data Sheets (PDS) which is identified by the part number preceded by "P".

6.4.6(a), Pump module: Delete in its entirety.

6.4.6(b), Cell module: Delete in its entirety.

The margins of this amendment are marked with an asterisk or vertical lines to indicate where such changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

Preparing activity:

Commander
U.S. Army Chemical Research, Development
and Engineering Center
ATTN: SMCCR-SPT-S
Aberdeen Proving Ground, MD 21010-5423

EA-D-1242B
7 March 1986
SUPERSEDING
EA-D-1242A
18 February 1981

CHEMICAL RESEARCH AND DEVELOPMENT CENTER PURCHASE DESCRIPTION

DETECTOR UNIT, CHEMICAL AGENT AUTOMATIC ALARM: M43A1

1. SCOPE

1.1 Scope. This specification covers one type of portable, automatic chemical agent detector.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

- QQ-S-781 - Strapping, Steel, and Seals.
- PPP-B-601 - Boxes, Wood, Cleated Plywood.
- PPP-B-621 - Box, Wood, Nailed and Lock Corner.
- PPP-B-636 - Boxes, Shipping, Fiberboard.

MILITARY

- MIL-P-60312 - Parts, Molded, Plastic Foam, Polystyrene (For Use With Ammunition).

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-252 - Classification of Visual and Mechanical Defects For Equipment, Electronic, Wired, and Other Devices.
- MIL-STD-454 - Standard General Requirements for Electronic Equipment.

- MIL-STD-461A - Electromagnetic Interference Characteristics Requirements For Equipment.
- MIL-STD-462 - Electromagnetic Interference Characteristics, Measurement Of.
- MIL-STD-781 - Reliability Design Qualification and Production Acceptance Tests: Exponential Distribution.
- MIL-STD-810 - Environmental Test Methods.

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

DRAWINGS AND TECHNICAL DATA PACKAGE LIST (TDPL)

US ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND

CHEMICAL RESEARCH AND DEVELOPMENT CENTER

- 5-15-5300 - Mounting Kit, Chemical Agent Automatic Alarm: Low Profile, ABCA-M182.
- 5-15-6564-21 - Marking Diagram.
- 5-15-6583 - Overpack.
- 5-15-8100 - Detector Unit, Chemical Agent Automatic Alarm: M43A1.
- 5-15-8180 - Test Paddle Assembly.
- 5-15-8193 - Unit Package of Detector Unit, M43A1.
- 5-15-8211 - Blocked Air Filter Assembly.
- 136-47-0210 - Tester, Functional, Detector, Q238.
- 136-47-0250 - Simulant Aerosol Generator, Q239.

PUBLICATIONS

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

- TM 3-6665-312-12&P - Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List; Detector Unit, Chemical Agent Automatic, M43A1.
- TM 3-6665-312-30&P - Direct Support Maintenance Manual, Including Repair Parts and Special Tools List; Detector Unit, Alarm, Chemical Agent, Automatic: M43A1 and Associated Equipment.

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Materials and components.

3.1.1 Materials. All materials cited on Drawing 5-15-8100 or on the subsidiary drawings shall conform to the specifications listed thereon, or to the specific characteristics set forth on the drawings and in this specification.

3.1.2 Components. All components of the detector unit shall conform to the specifications and drawings listed on Drawing 5-15-8100 and subsidiary drawings.

3.2 Manufacture and assembly. The components shall be manufactured and assembled as specified on the subsidiary drawings listed on Drawing 5-15-8100.

3.3 Resistance to airflow. The resistance to airflow of the several sections of the air system shall be as required when tested as specified in 4.4.4.1.

(a) Detector air inlet to the chassis seal at the air pump inlet. At an airflow rate of 1.3 ± 0.1 liters per minute (l/m), with a detector cell and air filter paddle removed, the resistance to airflow of the air system from the detector air inlet to the pump inlet shall not exceed a pressure drop of 3.0 inches (7.62 centimeters) (cm) of water.

(b) Chassis seal at the air pump outlet to the detector air outlet. At an airflow rate of 1.3 ± 0.1 l/m, the resistance to airflow of the air system from the chassis seal at the air pump outlet to the detector air outlet shall not exceed a pressure drop of 0.5 inch (1.27 cm) of water.

3.4 Air leakage.

3.4.1 Air leakage at the detector's air filter seal. Air leakage around or past the detector's air filter shall not exceed a rate of 0.7 cubic centimeters (cc) per minute (cc/m) when a blank air filter is installed in place of the detector's air filter, and the downstream side of the air filter is at a pressure of 3.0 ± 0.5 inches (7.6 ± 1.3 cm) of water less than the upstream side when tested as specified in 4.4.4.2. For the purpose of this requirement, a blank air filter is defined as an air filter having the same interface dimensions as the M40 Test Sets blocked air filter assembly (Drawing 5-15-8211) but is impermeable to the passage of air.

3.4.2 Air leakage of the air system. The static air leakage rate of the system shall not exceed 1.2 cc per minute with the internal air pressure at 10 to 12 inches (25.4 - 30.5 cm) of water greater than the external pressure when tested as specified in 4.4.4.3.

3.5 Performance. The performance requirement of the detector shall be attained when tested under conditions as specified.

(a) Input voltage. A potential of 27.0 ± 9.0 volts direct current (vdc) shall be applied to the detector's 24 vdc input [1A4J1-E with respect to (wrt) 1A4J1-B].

(b) Environment. The air entering the detector's air inlet shall be at a temperature of $75^\circ \pm 5^\circ\text{F}$ ($24^\circ \pm 3^\circ\text{C}$).

(c) Airflow. The airflow measured at the air inlet shall be 1.3 ± 0.1 l/m free flow.

(d) Clean air. Unless otherwise specified, the air entering the air inlet shall be charcoal filtered.

(e) Alarm inhibit. Switch 1A5S5 shall be in the ON position.

3.5.1 Operating temperature. The temperature measured at the air filter location shall be $118^\circ \pm 8^\circ\text{F}$ ($47.8^\circ \pm 4.4^\circ\text{C}$) when tested as specified in 4.4.4.4.

3.5.2 Simulated alarm. Activation of the "built-in-test" (BIT) switch shall simulate the detector in the alarm mode of operation. The detector unit shall exhibit the following performance characteristics before and after the BIT switch is actuated when tested in accordance with 4.4.4.5:

(a) Before the BIT switch is actuated:

- (1) The detector meter shall be in the green zone.
- (2) The detector horn shall not be sounding.
- (3) The voltage at the REMOTE terminals shall be less than 1.0 vdc.
- (4) The pump motor shall be operating.
- (5) The input current measured at 1A4J1-E shall be 115 ± 25 milliamperes (ma).
- (6) The output of the summing amplifier (1A5J10-10 wrt 1A5J10-7) shall be 5.0 ± 0.5 vdc.

(b) After the BIT switch is actuated:

- (1) The detector meter shall rise from the green zone to the black zone and return to zero.
- (2) The detector horn shall sound with a varying frequency.

(3) The horn sound output level shall decrease as the HORN VOL control is rotated from fully clockwise (cw) to fully counterclockwise (ccw).

(4) A voltage within 4.5 volts of the input voltage (1A4E4 wrt 1A4E3) shall appear at the REMOTE terminals and at 1A4J1D wrt 1A4J1C.

(5) The input current measured at 1A4J1-E shall be less than 60 milliamperes (ma).

(6) The pump motor shall stop operating.

(7) The output of the detector summing amplifier (1A5J10-10 wrt 1A5J10-7) shall be less than 0.2 vdc.

The detector shall remain in the alarm mode [3.5.2(b)] until the RESET switch is actuated and shall be returned to the pre-alarm mode [3.5.2(a)] by activation of the RESET switch.

3.5.3 Meter accuracy. With the input voltage at the detector's 24 vdc input (1A4J1-E wrt 1A4J1-B) at 26 vdc and 24 vdc, operation of the BATTERY TEST switch shall cause the detector meter to indicate within 2.0 volts of the input voltage when tested in accordance with 4.4.4.6.

3.5.4 Stability. With the auto background zeroed (1A5J10-4 connected to 1A5J10-3) the detector's summing amplifier output voltage (1A5J10-10 wrt 1A5J10-7) shall be 5.0 ± 0.5 vdc and shall not exhibit drifts in excess of 0.2 volts per hour during a monitoring period of at least 1.0 hour nor exhibit random perturbations in excess of 0.4 volts, when tested in accordance with 4.4.4.7.

3.5.5 Sensitivity. With the auto background zeroed (1A1A2P8-3 connected to 1A1A2P8-4) and after a run in period the summing amplifier baseline voltage shall be 5.0 ± 0.5 vdc. During exposure to a concentration of $.08 \pm .01$ milligrams per cubic meter (mg/m³) of dimethyl methyl phosphonate in air at a relative humidity of 50 ± 10 percent, the detector shall alarm with the auto background on within 2 minutes and the summing amplifier output with auto background off shall not exceed 14 vdc within 5 minutes when tested as specified in 4.4.4.8.

3.5.6 Nuclear effects compensation. With the alarm inhibited (1A5J10-2 connected to 1A5J10-1) and the auto background zeroed (1A5J10-4 connected to 1A5J10-3), the detector's summing amplifier output voltage (1A5J10-10 wrt 1A5J10-7) shall be within ± 1.00 vdc of baseline output prior to test within one minute after applying a simulated positive or negative 5.0 ± 0.5 millivolt DC offset to the input of the preamplifier in accordance with 4.4.4.16.

3.6 Radiation.

3.6.1 Alpha contamination. The average removable alpha radiation on the exterior surface of the detector shall not exceed 100 disintegrations per minute per 100 square centimeters when tested in accordance with 4.4.4.9.

3.6.2 Gamma radiation. When tested in accordance with 4.4.4.10, the radiation dose at the exterior surface of the unpackaged detector shall not exceed 0.7 millirems per hour.

3.7 Detector leakage. The detector shall be tested in accordance with 4.4.4.11.1. If a leak exists at the dust cover air outlet interface or between case top and bottom only, use 4.4.4.11.2 to assure no leakage using positive pressure.

3.7.1 Water immersion. When tested in accordance with 4.4.4.11.1, there shall be no evidence of leakage with the detector assembly completely immersed in water so that the upper most part of the case is 2 ± 1 inches (5.08 ± 2.54 cm) below the surface of the water and the detector internally pressurized to a pressure of 50 ± 2 inches (127 ± 5.08 cm) of water and maintained for a minimum of 60 seconds. Two or more bubbles coming from within the case shall be considered a leakage; however, bubbles which result from trapped air on the exterior surfaces of the case shall not be considered a leak.

3.7.2 Air pressure. When tested in accordance with 4.4.4.11.2, there shall be no evidence of leakage from the hose attached to the air inlet when the pressure vessel is pressurized to 50 ± 2 inches (127 ± 5.08 cm) of water and allowed to stabilize for 15 seconds prior to commencing the test for a further 60 seconds. Bubbles coming from the hose after the stabilization period shall be considered a leakage. Bubbles which result from the detector stabilizing under pressure during the stabilization period shall not be considered a leak.

3.8 Electromagnetic interference. When tested in accordance with 4.3.3.6 the detector shall meet the following requirements of MIL-STD-461A.

<u>Method</u>	<u>Range</u>	<u>Limit</u>
CE01	30 Hz to 50 kHz	Fig 4
CE04	50 kHz to 50 MHz	Fig 5, Fig 6
CS01	30 Hz to 50 kHz	Fig 8
CS02	50 kHz to 400 MHz	Fig 19
CS06	Spike 10 sec	Fig 10
RE02	14 kHz to 1000 MHz (Broadband)	Fig 13 @ 1 meter
RE02.1	14 kHz to 12.4 GHz (Narrowband)	Fig 12 @ 1 meter
RS03.1	2 MHz to 29.9 MHz	5 V/M
	30 MHz to 299 MHz	10 V/M
	300 MHz to 1999 MHz	10 V/M
	2000 MHz to 12.4 GHz	5 V/M

3.9 Low temperature startup. When tested in accordance with 4.4.4.12 the detector shall operate within 50 minutes of the application of 28.0 ± 2.0 vdc to the detector's 24 vdc input (~~1A4J1-E wrt 1A4J1-B and 1A4J1-A wrt 1A4J1-B~~) with the alarm inhibited (1A5J10-2 connected to 1A5J10-1) following an exposure of at least 3.0 hours duration to a temperature of $-40^\circ \pm 5^\circ\text{F}$ ($-40^\circ \pm 3^\circ\text{C}$) while in a nonoperating condition and no power applied to the detector's 24 vdc input. The input current measured at 1A4J1-E shall be between 970 and 1260 ma after application of power to the 24 vdc input. Operation shall be evidenced by the following:

- (a) The pump motor shall be operating.
- (b) The appearance of 5.0 ± 0.5 vdc from the detector's summing amplifier (1A5J10-10 wrt 1A5J10-7).
- (c) The input current measured at 1A4J1-E shall be between 1.1 to 1.45 amps.

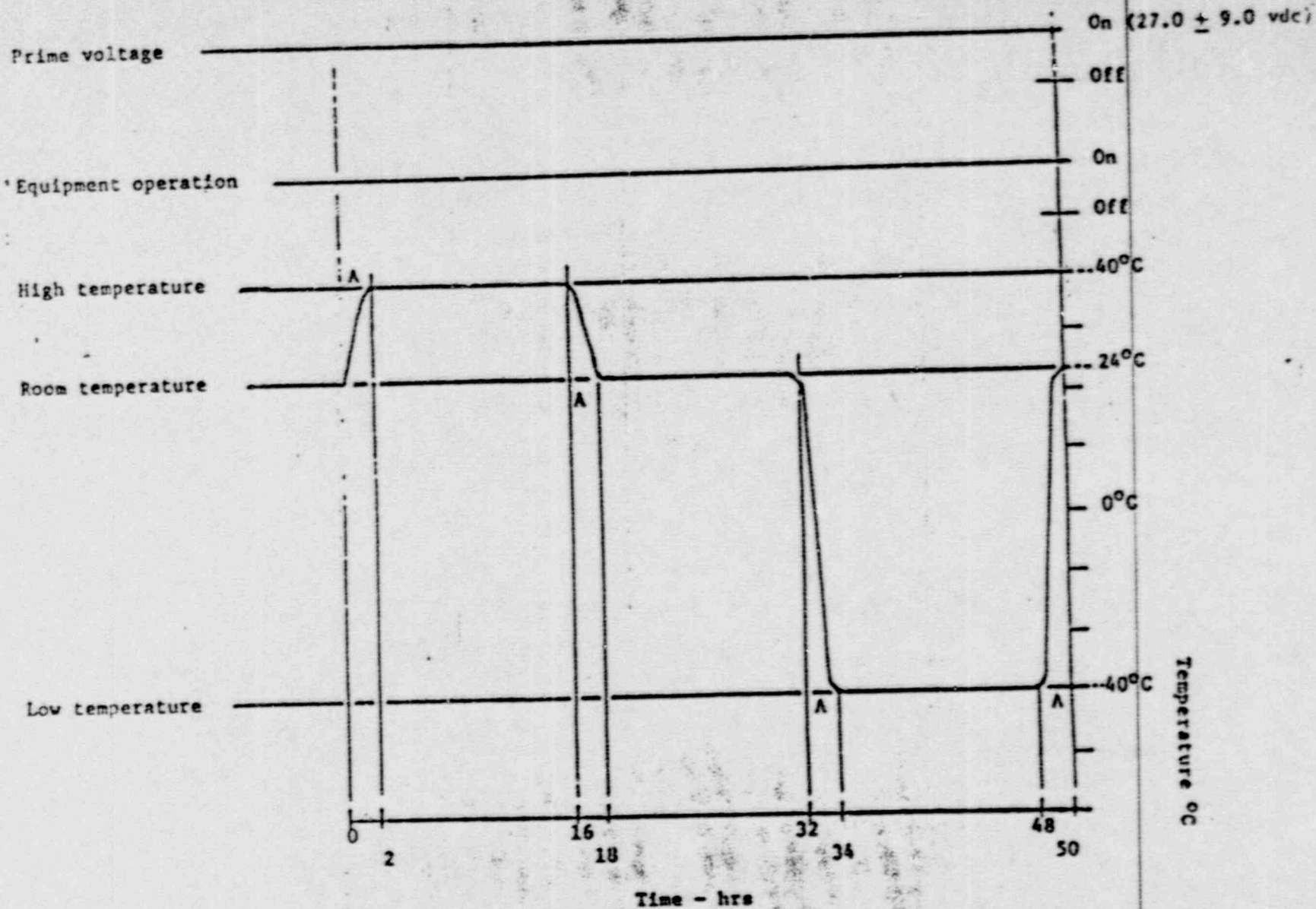
Fifteen minutes after the detector unit has been in operation, install the flow-meter in the detector air inlet; the ball should be in the green zone. Remove the inhibit connection and press the BIT switch. The detector shall meet the requirements of 3.5.2(b) except that input current shall be between 970 and 1260 ma.

3.10 Vibration.

3.10.1 Operation during vibration. When tested in accordance with 4.3.3.7 the detector shall operate without stoppage (see 6.4.4) and shall not experience any anomaly requiring corrective maintenance during exposure to the vibration environment described in MIL-STD-810, Method 514.2, procedure VIII, curve W (6,000 miles) (9,654 kilometers) while mounted in a mounting kit (Drawing 5-15-5300) and then meet the requirements of Resistance to airflow, Air leakage, Radiation, and Detector leakage.

3.10.2 Operation after vibration. When tested as specified in 4.4.4.13 the detector shall exhibit no physical deterioration and shall meet the requirements of Simulated alarm, Stability, and Sensitivity.

3.11 Reliability. The detector shall meet the following criteria for Mean Time Between Stoppages (MTBS) (see 6.4.1), Mean Time Between False Alarms (MTBFA) (see 6.4.2), and Mean Time Between Failures (MTBF) (see 6.4.3), while subjected to the test cycle described by figure 1 when tested in accordance with 4.4.4.14:



A - Time for chamber to reach stabilization at required temperature.

NOTE: Before, during and after each cycle the detector unit shall meet the performance criteria specified in 3.12.

FIGURE 1. Reliability cycle

Reliability Criteria (Hours)

Lower Test* (θ_1)

MTBS	469
MTBFA	1000
MTBF	1250

*As defined in MIL-STD-781.

The following occurrences shall be considered as stoppages (6.4.4) of the detector:

(a) At the start and end of each test cycle:

(1) The detector meter fails to indicate a voltage of within 2.0 volts of the input voltage when the BATTERY Test switch is pressed.

(2) The airflow is outside the green zone of the detector flow meter (1.1 to 1.5 liters per minute).

(3) The detector fails to meet the requirements of Simulated alarm.

(b) While the detector is in normal operation:

(1) The detector false alarms (see 6.4.5).

(2) There is no low or high airflow of the detector as determined by the detector flow meter.

(3) The detector meter is not within the green band.

(4) The appearance of a voltage outside the range of 5.00 ± 0.5 vdc from the detector summing amplifier (1A5J10-10 wrt 1A5J10-7).

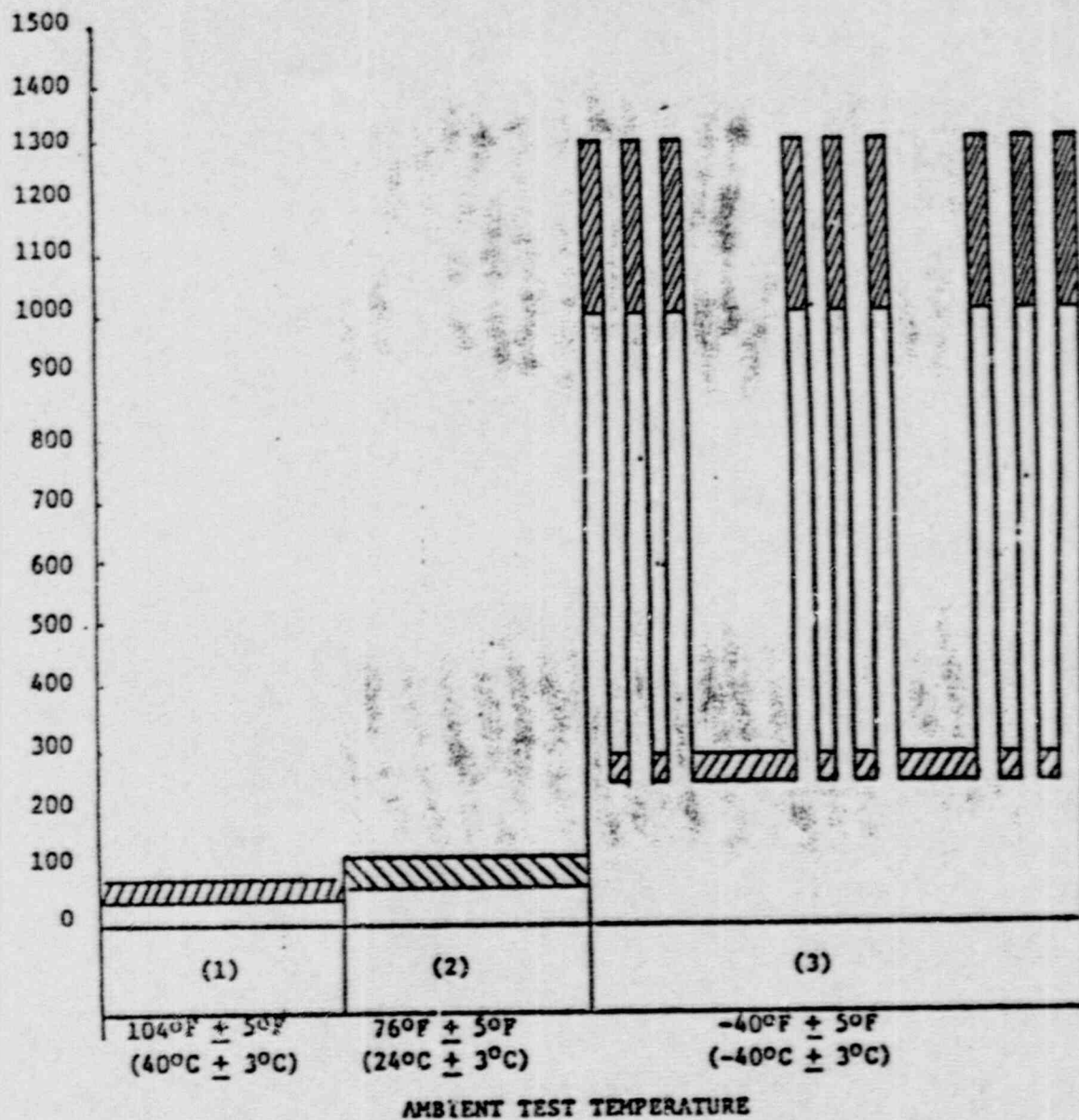
(5) Indications of dithering (see 6.4.9) or creepage (see 6.4.8) of the detector thermostat switches, S3 or S4, as evidenced by deviation from the nominal pattern shown in figure 2.

(6) The detector operating input current fails to fluctuate as shown in figure 2.

(c) While the detector is in the alarm mode:

(1) A voltage within 4.5 volts of the input voltage (1A4E4 wrt 1A4E3) fails to appear at the REMOTE terminals or at 1A4J10 wrt 1A4J1C.

APPROXIMATE DETECTOR INPUT CURRENT (ma)
(at 24 vdc)



Operating Detector

- (1) Less all heaters
(High Temperature)
- (2) Plus inlet air heater
(Room Temperature)
- (3) Plus cycling case
bottom heater
(Low Temperature)



Denotes input current range

NOTE: This chart shows input current fluctuation at temperature specified.

FIGURE 2. Detector operating input current.

(2) Detector airflow, as indicated by the detector flow meter, fails to drop to zero.

(3) The voltage from the detector summing amplifier (1A5J10-10 wrt 1A5J10-7) fails to drop to below 0.2 vdc.

(4) The detector horn does not sound with a varying frequency.

(5) The detector fails to remain in alarm mode until the RESET switch is actuated.

(6) The detector cannot be reset by actuation of the RESET switch.

Upon completion of the reliability test, the detector shall meet the requirements of Sensitivity and Radiation.

3.12 Low temperature storage. The detector unit shall withstand a low temperature storage for no less than 48 hours at $-65^{\circ} \pm 5^{\circ}\text{F}$ ($-54^{\circ} \pm 3^{\circ}\text{C}$) and then meet the requirements of Resistance to airflow, Air leakage, Performance, Radiation, and Detector leakage when tested in accordance with 4.3.3.1.

3.13 High temperature storage. The detector unit shall withstand a high temperature storage for no less than 48 hours at $165^{\circ} \pm 5^{\circ}\text{F}$ ($74^{\circ} \pm 3^{\circ}\text{C}$) and then meet the requirements of Resistance to airflow, Air leakage, Performance, Radiation, and Detector leakage when tested in accordance with 4.3.3.2.

3.14 Operation during rain. The detector unit, while in operation, shall withstand the rainfall specified in procedure II, Method 506.1 of MIL-STD-810 with the top panel of the detector in the up position and then with the unit canted $45^{\circ} \pm 5^{\circ}$ on each of the four sides for at least 0.5 hour at each orientation for a total exposure of 2.5 hours. During this rainfall exposure, the detector unit shall neither false alarm (see 6.4.5) nor experience any anomaly requiring corrective maintenance, shall meet the Simulated alarm requirement at each orientation of the detector, except the voltage at the remote terminals and at 1A4J1D wrt 1A4J1C shall be not greater than 8.0 volts below the input voltage (1A4E4 wrt 1A4E3), and not accumulate water in the detector case when tested in accordance with 4.3.3.3.

3.15 Operation after shock. The detector unit shall withstand the shock environment specified in MIL-STD-810, Method 516.2, procedure II, except that the detector unit shall be completely unpackaged and dropped from a height of no less than 28 inches so as to strike at least once on each face and corner for a total of 14 drops. After this shock the unit shall meet the requirements of Resistance to airflow, Air leakage, Performance, Radiation, and Detector leakage when tested in accordance with 4.3.3.4.

3.16 Preproduction. Prior to the start of regular production, a preproduction sample of detectors shall be produced in accordance with this specification for examination and test (see 4.3).

3.17 Preshipment requirements.

3.17.1 Purging. Prior to shipment, detector units shall be purged for at least 30 minutes immediately after final exposure to simulant.

3.17.2 Alarm inhibit switch. Prior to shipment, the detector alarm inhibit switch shall be placed in the normal position (top of toggle switch pointing to the outside of the case) when inspected in accordance with 4.4.4.

3.18 Workmanship. The workmanship of the detector shall be in accordance with MIL-STD-454.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection.

4.1.1 Contractor's responsibility. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.2 Objective evidence. The contractor shall provide objective evidence acceptable to the contracting officer that the requirements of 3.1 and section 5 for which specific inspection has not been provided in this specification have been satisfied.

4.2 Classification of inspection. The inspection requirements specified herein are classified as follows:

- (a) Preproduction inspection (see 4.3)
- (b) Quality conformance inspection (see 4.4).

4.3 Preproduction inspection.

4.3.1 Sample. A preproduction sample of 22 detectors shall be manufactured using the same methods, materials, equipment and processes as will be used during regular production; the provisions of Preconditioning burn-in of MIL-STD-781 shall apply.

4.3.2 Inspection procedures for examination and test. The preproduction sample of detectors shall be tested in accordance with 4.4.4.1 through 4.4.4.11 for conformance to the requirements of 3.3 through 3.7. The tests may be performed in any convenient order except that 4.4.4.7 and 4.4.4.8 shall be the last tests performed and 4.4.4.8 shall be performed after 4.4.4.7. The preproduction sample of detectors shall then be examined and tested in accordance

with classification of defects (4.4.3.4) for conformance to the requirements of 3.10.2 and 3.17. All of the detectors shall then be tested as specified in 4.4.4.14 without the occurrence of a stoppage. Each detector shall be run for at least 50 hours as specified in figure 1. The detectors shall then be divided into groups and tested as specified in table I.

Table I. Preproduction sample testing.

Group	Quantity	Requirement	Test paragraph	Accept/Reject Criteria
I	12	3.11	4.4.4.14	(see 4.3.3.5)
II	8	3.12	4.3.3.1	0/1
		3.13	4.3.3.2	0/1
		3.14	4.3.3.3	0/1
		3.9	4.4.4.12	0/1
		3.10.1	4.3.3.7	0/1
	2	3.8	4.3.3.6	0/1

4.3.3 Tests. Tests shall be conducted as follows:

4.3.3.1 Low temperature storage. Examine the detector to establish that the pump unit, the electronics module and the cell are properly installed and secured. Reinstall the case bottom. Install the covers onto the electrical connector and the air outlet. Close the air inlet. Examine the rainshield and the flow meter to establish that these components are properly installed and secured. Place the detector in the environmental test chamber and lower the internal chamber temperature to the required storage temperature and maintain the temperature for the required time. Raise the internal chamber temperature to ambient conditions and allow at least one hour for the detector to stabilize. Operate and inspect the detector as required.

4.3.3.2 High temperature storage. Examine the detector to establish that the pump unit, the electronics module and the cell are properly installed and secured. Reinstall the case bottom. Install the covers onto the electrical connector and the air outlet. Close the air inlet. Examine the rainshield and the flow meter to establish that these components are properly installed and secured. Place the detector in the environmental test chamber and raise the internal chamber temperature to the required storage temperature and maintain the temperature for the required time. Lower the internal chamber temperature to ambient conditions and allow at least one hour for the detector to stabilize. Operate and inspect the detector as required.

4.3.3.3 Operation during rain. Examine the detector to establish that the pump unit, the electronics module and the cell are properly installed and secured. Reinstall the case bottom. Remove the covers from the electrical connector and the air outlet. Install the rainshield in the air inlet. Place

the detector in the rain chamber, connect power, establish normal operation and expose the detector to the required rainfall environment. Monitor the detector for false alarm (see 6.5.5) during the rainfall period. The rain may be interrupted for the period of time necessary to enter the test chamber and reposition the detector as required. Upon completion of the rainfall exposure operate and inspect the detector as required. The test shall be completed within one hour after the detector is removed from the rain environment.

4.3.3.4 Operation after shock. Examine the detector to establish that the pump unit, the electronics module and the cell are properly installed and secured. Reinstall the case bottom. Install the covers onto the electrical connector and the air outlet. Close the air inlet. Examine the rainshield and the flow meter to establish that these components are properly installed and secure. Subject the detector to the required shock stress while non-operating. After each drop re-examine the detector to establish that the pump unit, the electronics module, the cell, the rainshield and the flowmeter are all still properly installed and secure, that the covers over the electrical connector and the air outlet are still installed, and that the air inlet is still closed. Upon completion of the shock stress, operate and inspect the detector as required.

4.3.3.5 Reliability. The detectors shall be tested as specified in 4.4.4.14 with "accept" and "reject" criteria in accordance with the following test plans of MIL-STD-781:

MTBS - Test Plan 20-12
 MTBFA - Test Plan 10-4
 MTBF - Test Plan 20-4

Continue testing until either an "accept" decision is reached for all three criteria (MTBS, MTBFA, and MTBF) or a "reject" decision is reached for one of three criteria (MTBS, MTBFA or MTBF). The provisions of Determination of compliance of MIL-STD-781 shall apply.

4.3.3.6 Electromagnetic interference. Test the detector for electromagnetic interference using MIL-STD-462.

4.3.3.7 Operation during vibration. Examine the detector to establish that the pump unit, the electronics module and the cell are properly installed and secured. Reinstall the case bottom. Examine the rainshield and the flowmeter to establish that these components are properly installed and secured. The chains securing the electrical connector cover and the filter part cover to the detector may be taped to the detector to reduce noise during the test. Attach all required instrumentation, connect power, establish normal operation and expose the detector to the required vibration environment. Monitor the detector input current, summing amplifier output and the output voltage from the REMOTE terminals (1A4E3 and 1A4E4) or from 1A4J1D wrt 1A4J1C for the occurrence of a stoppage (see 6.4.4). Upon completion of the vibration environment, operate and inspect the detector as required.

4.3.4 Acceptance/rejection criteria. The preproduction sample of detectors shall ~~comply with the examination and tests specified in 4.3.2 to be acceptable.~~ The contractor shall obtain written approval from the contracting officer before proceeding with regular production.

4.4 Quality conformance inspection.

4.4.1 Lotting. A lot shall consist of the detectors offered for acceptance at one time, which have been produced by one manufacturer, at one plant, under essentially the same manufacturing conditions.

4.4.2 Sampling.

4.4.2.1 For examination and test. Sampling for examination and test shall be conducted in accordance with MIL-STD-105.

4.4.3 Inspection procedures.

4.4.3.1 For examination and test. Sample detectors and level A packaging shall be examined and tested in accordance with the classification of defects 4.4.3.4 and MIL-STD-105.

4.4.3.2 For test. Each detector shall be tested in accordance with 4.4.4.1 through 4.4.4.11. The tests may be performed in any convenient order except that 4.4.4.7 and 4.4.4.8 shall be the last tests performed, and 4.4.4.8 shall be performed after 4.4.4.7. The lot of detectors shall then be sampled for major defects as listed in 4.4.3.4(a). All of the detectors shall then be tested as specified in 4.4.4.14 with "accept" and "reject" criteria in accordance with all the equipment production reliability acceptance test of MIL-STD-781 and the following figures of MIL-STD-781: MTBS figure C12, MTBFA figure C14, and MTBF figure C14. The provisions of Determination of compliance of MIL-STD-781 shall apply. Each detector shall be run for at least 50 hours as specified in figure 1.

4.4.3.3 For critical defects. Each detector in the lot shall be inspected for critical characteristics listed in the classification of defects.

4.4.3.4 Classification of defects.

(a) Detector unit, chemical agent automatic alarm (Dwg 5-15-8100).

<u>Categories</u>	<u>Defects</u>	<u>Acceptance standards</u>
<u>Major:</u>	AQL 1.5 percent defective	
101	Operation during vibration	4.4.4.13

Minor: AQL 6.5 defects per hundred units

201 Workmanship (applicable defects listed as Minor in MIL-STD-252 - see 3.18)

AQL 10.0 defects per hundred units

202 Workmanship (applicable defects listed as Control in MIL-STD-252 - see 3.18)

(b) Packaging (section 5).

<u>Categories</u>	<u>Defects</u>	<u>Acceptance standards</u>
<u>Critical:</u>		
1	Radiation	4.4.4.9 and 4.4.4.15
<u>Major:</u> AQL 1.0 percent defective		
101	Packaging component missing, incorrect, or incorrectly assembled	
102	Packaging component damaged	
103	Marking missing, incorrect, or illegible	
<u>Major:</u> AQL 2.5 percent defective		
104	Moisture content	5.1.1

4.4.4 Tests.

4.4.4.1 Resistance to airflow. Determine the resistance to airflow utilizing the Q238 Tester, Functional, Detector (Drawing 136-47-0210).

4.4.4.2 Air leakage at the detector's air filter seal. Determine the air leakage at the detector's air filter seal utilizing the Q238 Tester, Functional, Detector (Drawing 136-47-0210).

4.4.4.3 Air leakage of the air system. Determine the air leakage of the air system utilizing the Q238 Tester, Functional, Detector (Drawing 136-47-0210).

4.4.4.4 Operating temperature. Determine the temperature at the air filter location utilizing the Q238 Tester, Functional, Detector (Drawing 136-47-0210).

4.4.4.5 Simulated alarm. Test the detector's response to actuation of the BIT switch utilizing the Q238 Tester, Functional, Detector (Drawing 136-47-0210).

4.4.4.6 Meter accuracy. Test the detector's meter accuracy by depressing the BATTERY TEST switch and evaluate. The meter response shall be as required.

4.4.4.7 Stability. Attach all required instrumentation, connect power, establish normal operation and monitor the detector summing amplifier output as required.

4.4.4.8 Sensitivity. Install a test adapter fitting in the air inlet of the detector to facilitate connecting the detector to the test reagent (DMMP) source. This DMMP source shall be the Simulant Aerosol Generator (Dwg 136-47-0250). Connect power to the detector and establish normal operation. After normal operation has been established, connect the detector to the DMMP source and start a timer. Record the summing amplifier output at 2 minutes and peak voltage within 5 minutes. When the detector horn sounds, stop the timer, disconnect the detector from the DMMP source, depress the detector RESET switch and record the elapsed time indicated by the timer.

4.4.4.9 Alpha contamination. With absorbent material such as millipore filter paper, wipe approximately 16 square inches (103 sq cm) of the required exterior surface using moderate pressure. Using radiation detection instruments, measure the activity on the wiping material as detailed in the equipment operating instructions. The average measured activity shall not exceed requirements.

Caution: Clean hands with soap and water before and after performing tests.

4.4.4.10 Gamma radiation. Using a gamma radiation detector, measure the radiation rate from the various surfaces of the unpackaged unit to attain the highest reading. The highest measured rate shall not exceed requirements.

4.4.4.11 Detector leakage.

4.4.4.11.1 Water immersion test. Remove pump unit and cell, close air outlet, close air inlet and install rainshield. Attach pressure hose to rainshield adapter and pressurize as required. Place under water so that top surface is at the required depth below the surface and look for bubbles.

4.4.4.11.2 Positive air pressure test. Close air outlet and install rainshield adapter. Place in pressure vessel and attach hose to rainshield adapter and pressurize as required. Place the air inlet hose in a transparent vessel containing water and look for bubbles.

4.4.4.12 Low temperature startup. Attach all required instrumentation, connect the power source and establish normal operation of the detector. Disconnect power and place the detector into an environmental test chamber. Lower the internal chamber temperature to the required temperature. Maintain the detector, nonoperating at the required temperature for the required time. Inhibit the alarm, apply power to the detector, monitor the detector input current, and record the time required for the detector to start operating. After the detector starts operating, wait the required time and activate the BIT switch after removing the alarm inhibit condition. Monitor detector operation as required. Evaluate the results of the tests and observations as required.

4.4.4.13 Operation after vibration. Examine the detector to establish that the pump unit, the electronics module and the cell are properly installed and secured. Reinstall the case bottom. Examine the rainshield and the flow meter to establish that these components are properly installed and secured. The chains securing the electrical connector cover and the filter part cover to the detector may be taped to the detector to reduce noise during the test. Mount the detector onto a vibration table in the vertical position. Subject the detector to 2.2 G + 10 percent peak acceleration value at a nonresonant frequency between 20 and 60 Hertz (as determined in 4.3.3.7) in the vertical plane as measured at the equipment monitoring points on the vibration table. The duration of vibration shall be at least two hours. The vibration transducer shall be "on" and monitored during vibration. Upon completion of the two hour vibration period, remove the detector from the vibration table and visually examine the unit for physical deterioration. Operate and inspect the detector as required.

4.4.4.14 Reliability.

4.4.4.14.1 Test planning. A reliability test plan document and reliability test procedures shall be prepared in accordance with Reliability test planning, Reliability test plan document, and Reliability test procedures of MIL-STD-781.

4.4.4.14.2 Operation, maintenance, and repairs. The detector shall be operated, maintained, and repaired in accordance with the procedures described in TM 3-6665-312-30EP and TM 3-6665-312-124P, except that any power source supplying 15 to 38 vdc may be used in lieu of those specified in the technical manual. If an alternate power source is used, be careful to observe the correct polarity when connecting the power source to the detector. The provisions of Verifying repair and Preventive maintenance of MIL-STD-781 shall apply.

4.4.4.14.3 Test facilities. Test facilities used for the reliability test shall comply with the provisions of Test facilities of MIL-STD-781.

4.4.4.14.4 Failure actions. On the occasion of a stoppage (see 6.4.4) the provisions of Failure actions of MIL-STD-781 shall apply.

4.4.4.14.5 Corrective action. Corrective action for all stoppages (see 6.4.4) shall be accomplished in accordance with the provisions of Corrective action of MIL-STD-781.

4.4.4.14.6 Test records. Test records shall be maintained in accordance with paragraph Test records of MIL-STD-781.

4.4.4.14.7 Restoration of tested equipment. Upon completion of the reliability test the detectors shall be refurbished in accordance with Restoration of tested equipment of MIL-STD-781.

4.4.4.14.8 Reliability test procedure. Examine the detector to establish that the pump unit, the electronics module and the cell are properly installed and secured. Remove the covers from the electrical connector and the air outlet. Install the rainshield in the air inlet and attach the flow meter to the rainshield. Attach all required instrumentation, connect power and establish normal operation. Operate the detector with the flow meter attached to remove any contaminants associated with the test chamber. The detector flow meter shall be used to measure airflow at the beginning of the test. A suitable calibrated airflow measuring device shall be used at the end of the test prior to removing power from the detector or performing the BIT testing.^{1/} After normal operation has been established, close the environmental test chamber door and subject the detector to the required environmental test cycle (figure 1). The operating detector should not be subjected to a rate of temperature change in excess of 54°F (3.0°C) per every five minutes. Monitor the detector input current, summing amplifier output and the REMOTE terminals as follows for the occurrence of a stoppage (6.4.4) during the environmental test cycle (figure 1):

(a) Monitor the detector input current with a suitable strip chart recorder a minimum of five consecutive minutes during each hour of operation.

(b) Monitor the summing amplifier output.

(c) Monitor the output voltage from the REMOTE terminals or from IA4J1D wrt IA4J1C.

Evaluate the recording of the detector input current as required. Evaluate the results of the tests and observations as required. At the start and upon completion of the test cycle check the detector as required. Upon completion of the reliability test, operate and inspect the detector as required.

^{1/} A suitable charcoal filter, such as the M140 Test Set filter, may be used in lieu of the detector flow meter after normal operation has been established.

4.4.4.15 Radiation (packaged). Using a radiation detector, measure the radiation dose rate on the surface of the external surface of the outside package (5.2) to attain the highest reading. The highest reading measured shall not exceed the requirement.

4.4.4.16 Nuclear effects compensation. Attach all required instrumentation, connect power, establish normal operation and monitor the summing amplifier output while performing the following steps:

(a) Simulate a +5 millivolt offset to the input of the preamplifier by applying $14.7 \pm .1$ vdc to the remote trigger input (1A5J10-8 wrt 1A5J10-1). Start a timer when the voltage is applied to the remote trigger input and stop the timer when the detector's summing amplifier output (1A5J10-10 wrt 1A5J10-7) has returned to the limits specified. Record the elapsed time as indicated by the timer.

(b) Remove all voltage from the remote trigger input and allow detector to establish normal operation.

(c) Simulate a -5 millivolt offset to the input of the preamplifier by applying 7.9 ± 0.1 vdc to the remote trigger input (1A5J10-8 wrt 1A5J10-1). Start a timer when the voltage is applied to the remote trigger input and stop the timer when the detector's summing amplifier output (1A5J10-10 wrt 1A5J10-7) has returned to the limits specified. Record the elapsed time as indicated by the timer.

4.4.4.17 Preshipment inspection. Detectors shall be visually inspected to verify that the alarm inhibit switch is in the required position prior to shipment.

5. PACKAGING

5.1 Preservation and unit packing, level A. The detector unit shall be unit packed in accordance with Drawing 5-15-8193.

5.1.1 Moisture content. The moisture content of the molded polystyrene overpack (E5-15-6583) prior to unit packing (5.1) shall not exceed 0.4 percent when tested in accordance with MIL-P-60312 with the exception that sampling shall be in accordance with this specification. The rejected overpacks shall be redried and retested to these requirements.

5.2 Packing. Level A or level B (see 6.2).

5.2.1 Level A. The detector unit, unit packed as specified in 5.1, shall be packed in containers conforming to the following:

(a) Box, wood, class 2, style 4, grade B, type 1 load, weight of contents 0-50 pounds, of PPP-B-621.

(b) Box, cleated plywood, overseas type, style optional, grade B, type 1 load, weight of contents 0-100 pounds, of PPP-B-601. The inside dimensions of the boxes shall be 9-1/8 by 9-1/8 by 18-1/8 inches (23.18 by 23.18 by 33.34 cm) [+ 1/8 inch (0.32 cm) tolerance on each of the dimensions] length, width, and depth, respectively. The boxes shall be closed and strapped in accordance with the appendix of their respective specifications. Strapping and seals shall conform to QQ-S-781 [Strapping - type I (regular duty), finish B, grade 2, and Seals - type D, style I or IV, finish B, grade 2].

5.2.2 Level B. The detector unit, unit packed as specified in 5.1, shall be packed as specified in 5.2.1, except that the containers shall be fabricated of fiberboard conforming to class weather-resistant, type CP, variety SW, grade W5c, or type SF, grade W5c, or type SF, grade W5s, style RSC, type I load (special requirements) of PPP-B-636. The box shall be closed in accordance with method V, closure requirements and strapped with nonmetallic or tape banding in accordance with the reinforcement requirements in the appendix to PPP-B-636.

5.3 Marking. In addition to any special marking required by the contract or order, unit packs (5.1) shall be marked in accordance with MIL-STD-129 (interior unit pack markings). Level A shipping containers (5.2.1) shall be marked in accordance with Drawing 5-15-6564. Level B shipping containers (5.2.2) shall be marked in accordance with MIL-STD-129 (exterior container identification and contract data markings).

5.4 Radiation.

(a) The radiation dose rate at any point on the external surface of the outside container (5.2) shall not exceed 0.5 millirems per hour when tested in accordance with 4.4.4.15.

(b) The average removable alpha radioactivity on the exterior surface of the outside container shall not exceed 100 disintegrations per minute per 100 square centimeters when tested in accordance with 4.4.4.9.

6. NOTES

6.1 Intended use. The detector unit is intended to detect and warn of the presence of V and G agents.

6.2 Ordering data. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Level of packing required.
- (c) Preproduction.

(1) Time allowed for contractor submission of samples for Government test and evaluation after award of contract.

(2) Name and address of test facility and shipping instructions when testing is performed by the Government.

(3) Time required for the Government to notify the contractor whether or not to proceed with production.

6.3 Test reagent. Dimethyl methyl phosphonate ventron grade, item 89999, boiling point 92° - 97°C/50 millimeters may be purchased from Alfa Division, Ventron Corporation, P. O. Box 299, 152 Andover Street, Danvers, MA 01923.

6.4 Definitions. For the purpose of this specification, the following definitions apply:

6.4.1 Mean time between stoppages (MTBS). Mean operating time between the occurrence of all stoppages (see 6.4.4).

6.4.2 Mean time between false alarms (MTBFA). Mean operating time between the occurrence of all false alarms (see 6.4.5).

6.4.3 Mean time between failures (MTBF). Mean operating time between the occurrence of all failures (see 6.4.6).

6.4.4 Stoppage. The occurrence of a false alarm (see 6.4.5); any detector anomaly requiring corrective maintenance; detector failure or inability to alarm to specified concentrations of the test reagent, DMMP. Stoppages caused by operator error (see 6.4.7), test equipment or facility failure are nonrelevant (see Nonrelevant failure, MIL-STD-781). A stoppage which causes a false alarm is to be considered as one stoppage.

6.4.5 False alarm. The sounding of the detector horn without the presence of the test reagent, DMMP, or the test paddle, unless the alarm was human induced (i.e. purposely sounded for testing purposed) and not due to operator error (see 6.4.7), test equipment or facility failure.

6.4.6 Failure. A stoppage that cannot be corrected by the operator without corrective maintenance or repaired by the replacement of one or more of the following:

- (a) Pump module.
- (b) Cell module.
- (c) Electronics module.
- (d) Case bottom.
- (e) Flow meter.
- (f) Air filter.

6.4.7 Operator error. Operation of the detector in a manner not in conformance with TM 3-6665-312-12&P.

6.4.8 Creepage. Failure of a thermostat to respond to temperature changes with immediate positive snap action of the disk at a set-temperature.

6.4.9 Dithering. A sudden deviation of the switching temperature of a thermostat from its original set-temperature, resulting in a very narrow switching band.

6.5 Contract data requirements. Items of deliverable data required by this specification are cited in the following paragraphs:

<u>Paragraph</u>	<u>Data Requirements</u>	<u>Applicable DID</u>
4.4.4.14.1	Plan, Reliability Test	DI-R-7033
4.4.4.14.1	Procedures, Reliability Test	DI-R-7035
4.4.4.14.5	Plan, Corrective Action	DI-R-7038

6.6 Superseded document. For the purpose of this specification only, MIL-STD-461A, Electromagnetic Interference Characteristics Requirements For Equipment is to be used.

6.7 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:

Commander
 U.S. Army Chemical Research and
 Development Center
 ATTN: SMCCR-SPD-TS
 Aberdeen Proving Ground, MD 21010-5423

ATTACH 3

PART LIST BACK PAGE

SPECIAL PACKAGING INSTRUCTION (AMCCOM SUPPL 1 TO AR 700-10)				NATIONAL STOCK NO. 66C5-01-081-8140			
NOMENCLATURE DETECTOR UNIT, CHEMICAL AGENT AUTOMATIC ALARM: M43A1			VI EA	CLEANING/DRYING C-1 / ANY		GPI NUMBER AND P5-15-8100	
LEVEL A UNIT PACK REQUIREMENTS (MIL-P-116 METHOD B/A)	STEPS	DRAWING OR SPECIFICATION	STYLE	TYPE	GRADE	CLASS	SIZE AND DIMENSIONS
BARRIER	•1	MIL-B-117	2	I		B	14 X 18
CLOSURE	••2	MIL-P-116					HEAT SEAL
OVERPACK	•••3	5-15-6583					2 REED
CLOSURE	••••4	PPP-T-97					2 REED, 1/2 IN. WIDE X 48 LG
BARRIER	•••••5	MIL-B-117	I OR 2	I OR II		E	10 1/2 X 13
CLOSURE	•••••6	MIL-P-116					HEAT SEAL
MARKING	••••••7						
LEVEL B: METHOD) <input checked="" type="checkbox"/> NOT APPLICABLE <input type="checkbox"/> SEE NOTE <input type="checkbox"/> IAW MIL-STD-883C-1 LEVEL C: METHOD) <input checked="" type="checkbox"/> NOT APPLICABLE <input type="checkbox"/> SEE NOTE <input type="checkbox"/> IAW MIL-STD-883C-1 COMMERCIAL PACKAGING <input checked="" type="checkbox"/> NOT APPLICABLE <input type="checkbox"/> SEE NOTE <input type="checkbox"/> IAW ASTM-D2001							
UNIT PACK LOGISTICS DATA (WEIGHTS AND SIZES APPROXIMATE)							
LEVEL	UNIT PACK QUANTITY	UNIT PACK WEIGHT	UNIT PACK CUBE	UNIT PACK SIZE (EXTERIOR) FEET			
A	1	10.00	.663	.80 X .76 X 1.09			
INTERMEDIATE PACKAGING AND PACKING WILL BE IN ACCORDANCE WITH SPECIFICATION MIL-STD-883C-1 OR AS OTHERWISE SPECIFIED HEREIN. ••••••							
MARKING WILL BE IN ACCORDANCE WITH MIL-STD-129. •••••• / ••••••••••							
SPECIFICATIONS, STANDARDS, AND DRAWINGS LISTED HEREIN OF THE ISSUE IN EFFECT ON DATE OF INVITATION FOR BID FORM A PART OF THIS DATA SHEET. THE APPLICABLE GENERAL AND REFERENCED REQUIREMENTS OF SPECIFICATION MIL-STD-883C-1 FORM PART OF THIS DATA SHEET. UNLESS OTHERWISE SPECIFIED, MATERIALS WILL BE MINIMUM SIZE IAW MIL-STD-883C-1.							
TOLERANCES SHALL BE IN ACCORDANCE WITH MATERIAL SPECIFICATIONS. QUALITY PERFORMANCE AND TESTING REQUIREMENTS SHALL BE IN CONFORMANCE WITH MIL-P-116 OR AS OTHERWISE SPECIFIED HEREIN. •••••• / •••••••••• / ••••••••••							
REMARKS / NOTES							
<ul style="list-style-type: none"> • -PRIOR TO ENCLOSING DETECTOR IN BARRIER, ALL OPENINGS ON DETECTOR SHALL BE CLOSED USING CLOSURES PROVIDED. THE BOTTOM OF THE DETECTOR SHALL BE INSTALLED AND ALL FASTENERS LATCHED. BAO MATERIAL SHALL BE I-P-378, TYPE I OR II, GRADE A, AS SPECIFIED IN MIL-B-117. •• -HEAT SEAL IN ACCORDANCE WITH BARRIER SUPPLIER'S RECOMMENDATION. INCLUDED AIR VOLUME IN BAO SHALL BE KEPT TO A MINIMUM. TESTING OF BARRIER NOT REQUIRED. ••• -SECURE TWO OVERPACK HALVES TOGETHER USING SPECIFIED TAPE, AS SHOWN ON SKETCHES 1 AND 2, PAGE 4. CLOSURE TAPE (STEP 4) SHALL OVERLAP TO FORM A PULL-TAB AS SHOWN ON SKETCH 2, PAGE 4. AT THE SAME TIME THE HALVES ARE TAPED TOGETHER, SECURE PACKAGED TM 3-8665-312-12 & P TO OVERPACK ON OPPOSITE SIDE FROM MARKING (STEP 5, NOTE ••••••). •••• -MOISTURE CONTEXT. THE MOISTURE CONTENT OF THE OVERPACK CONTAINER (STEP 3) SHALL NOT EXCEED 0.4 PERCENT WHEN TESTED IN ACCORDANCE 							
ITEM DATA (APPROX)		PREPARING ACTIVITY		66X2642 203-048		3 FEB 86	
ITEM CODE - Z03		AMCCOM 81361		-008			
ITEM SIZE -		SMCCR-SPD-PP					
7 7/8 X 6 3/4 X 11		PAGE NUMBER	NUMBER OF PAGES				
ITEM WEIGHT- 7.00		1	4	APPROVAL	REVISION	DATE	

SPECIAL PACKAGING INSTRUCTION (CONTINUED)

MATERIAL STOCK NUMBER

6665-01-081-8140

DPI NUMBER (PDI)

P5-15-8100

WITH MIL-P-60312, EXCEPT THAT SAMPLING SHALL BE IN ACCORDANCE WITH PURCHASE DESCRIPTION EA-D-1242. THE REJECTED OVERPACKS CAN BE REDRIED AND RETESTED TO THESE REQUIREMENTS PRIOR TO REPACKAGING (UNIT PACKING).

***** -TECHNICAL PUBLICATION (SEE NOTE *** ABOVE) SHALL BE ENCLOSED IN SPECIFIED BARRIER (STEP 5) AND CLOSED (STEP 6).

***** -THE SPECIAL MARKINGS BELOW SHALL BE APPLIED IN ACCORDANCE WITH MIL-STD-129.

A. MARK OVERPACK (STEP 3) AS SHOWN ON SKETCH 1. APPLY TWO DECAL WARNING LABELS AS SHOWN ON SKETCH 2. WHEN SHIPPED BY MILITARY AIR TRANSPORTATION, MARK "RADIOACTIVE" ON AREA SHOWN ON SKETCH 1.

B. LOCATE DECALS APPROXIMATELY AS SHOWN (SEE PAGE 4) ON ONE HALF OF OVERPACK. LOCATE SAME DECALS ON OPPOSITE SIDE OF OTHER HALF AFTER MATING HALVES.

C. MARK SERIAL NUMBER OF CELL MODULE (5-15-8105) ON OVERPACK. LOCATE MARKING DIRECTLY UNDER THE IDENTIFICATION MARKINGS. THE SERIAL NUMBER SHALL BE PRECEDED BY THE WORDS "CELL MODULE SERIAL NO."

***** -PACKING. PACKING SHALL BE LEVEL A OR B (SEE PARA 6.2 OF PD EA-D-1242).

A. LEVEL A. THE DETECTOR UNIT, UNIT PACKED AS ABOVE, SHALL BE PACKED AS FOLLOWS:

1. BOX, WOOD, NAILED, CLASS 2, STYLE 4, GRADE B, LOAD TYPE 1, WEIGHT OF CONTENTS 0 - 50 POUNDS, OF PPP-B-621; OR BOX, WOOD, CLEATED-PLYWOOD, OVERSEAS TYPE, STYLE OPTIONAL, GRADE B, LOAD TYPE 1, WEIGHT OF CONTENTS 0 - 100 POUNDS, OF PPP-B-601.

2. THE INSIDE DIMENSIONS OF THE BOXES SHALL BE 10 1/4 X 9 1/8 X 13 1/8 INCHES (+ 1/8 INCH TOLERANCE OF EACH OF THE DIMENSIONS) LENGTH, WIDTH AND DEPTH, RESPECTIVELY. FIBERBOARD FILLER PADS, CONFORMING TO CLASS DOMESTIC, VARIETY SW, GRADE OPTIONAL, SHALL BE INCLUDED AS NECESSARY TO MAKE A TIGHT PACK. THE BOX SHALL BE CLOSED AND STRAPPED IN ACCORDANCE WITH THE APPENDIX OF THEIR RESPECTIVE SPECIFICATIONS. STRAPPING AND SEALS SHALL CONFORM TO OQ-S-781 (STRAPPING - TYPE I, (REGULAR DUTY), FINISH B, GRADE 2; SEALS - TYPE D, STYLE I OR IV, FINISH B, GRADE 2.)

B. LEVEL B. THE DETECTOR UNIT, UNIT PACKED AS ABOVE, SHALL BE PACKED IN A BOX, FIBERBOARD, CLASS WEATHER-RESISTANT, TYPE CF, VARIETY SW, GRADE W5c, STYLE RSC, LOAD TYPE I (SPECIAL REQUIREMENTS) OF PPP-B-636. THE BOX SHALL HAVE THE SAME INSIDE DIMENSIONS AND BE PACKED THE SAME AS FOR LEVEL A CONTAINERS. THE BOX SHALL BE CLOSED IN ACCORDANCE WITH METHOD V CLOSURE REQUIREMENTS AND STRAPED WITH PPP-T-97 TAPE IN ACCORDANCE WITH THE REINFORCEMENT REQUIREMENTS IN THE APPENDIX TO PPP-B-636.

NOMENCLATURE

DETECTOR UNIT CHEMICAL AGENT
AUTOMATIC ALARM: M43A1

PAGE NUMBER

2

NUMBER OF PAGES

4

SPECIAL PACKAGING INSTRUCTION (CONTINUED)

NATIONAL STOCK NUMBER

6665-01-081-8140

SPZ NUMBER (PDI)

P5-15-8100

***** -RADIATION. THE RADIATION DOSE RATE AT ANY POINT ON THE EXTERNAL SURFACE OF THE OUTSIDE CONTAINER (SEE NOTE ***** ABOVE) SHALL NOT EXCEED 0.5 MILLIREMS PER HOUR WHEN TESTED IN ACCORDANCE WITH PARA 4.4.4.10 OF PD EA-D-1242.

***** -SHIPPING CONTAINER SPECIAL MARKINGS. IN ADDITION TO THE STANDARD EXTERIOR CONTAINER MARKINGS, THE FOLLOWING SPECIAL MARKINGS SHALL BE APPLIED TO THE EXTERIOR LEVEL A AND B PACKS. UNLESS OTHERWISE SPECIFIED, MARKINGS SHALL BE IN ACCORDANCE WITH MIL-STD-129.

A. AFFIX DECALS 5-15-8417 AND 5-15-8418 TO TWO OPPOSITE SIDES OF THE SHIPPING CONTAINER, ONE TO BE LOCATED ON SIDE CONTAINING THE IDENTIFICATION MARKINGS.

B. WHEN SHIPMENTS ARE BY MILITARY AIRCRAFT:

1. STENCIL IN 1/2 INCH HIGH LETTERS THE WORD "RADIOACTIVE" ON AN UNOCCUPIED AREA ON THE SIDE CONTAINING THE IDENTIFICATION MARKINGS.

2. AFFIX DD FORM 1387-2 (SPECIAL HANDLING DATA/CERTIFICATION LABEL) TO BOX ON AN UNOCCUPIED AREA ADJACENT TO THE ADDRESS MARKINGS. INSTRUCTION FOR THE PREPARATION AND REQUIRED COPIES OF DD FORM 1387-2 LABELS SHALL BE IN ACCORDANCE WITH MARKING AND LABELING REQUIREMENTS OF TM 38-250.

C. MARK THE SERIAL NUMBER OF THE CELL MODULE (DRAWING 5-15-8105) ON THE SHIPPING CONTAINER IN ACCORDANCE WITH MIL-STD-129. THE SERIAL NUMBER SHALL BE PRECEDED BY THE WORDS "CELL MODULE SERIAL NO.".

***** -THE QUALITY PERFORMANCE AND TESTING REQUIREMENTS FOR THE PACKAGING REQUIREMENTS SPECIFIED HEREON SHALL BE IN ACCORDANCE WITH PD EA-D-1242.

NOMENCLATURE

DETECTOR UNIT CHEMICAL AGENT
AUTOMATIC ALARM: M43A1

PAGE NUMBER

3

NUMBER OF PAGES

4

AMCCOM FORM 357c-R, 1 AUG 84

110229

OFFICIAL RECORD COPY ML 10

FEB 06 1989

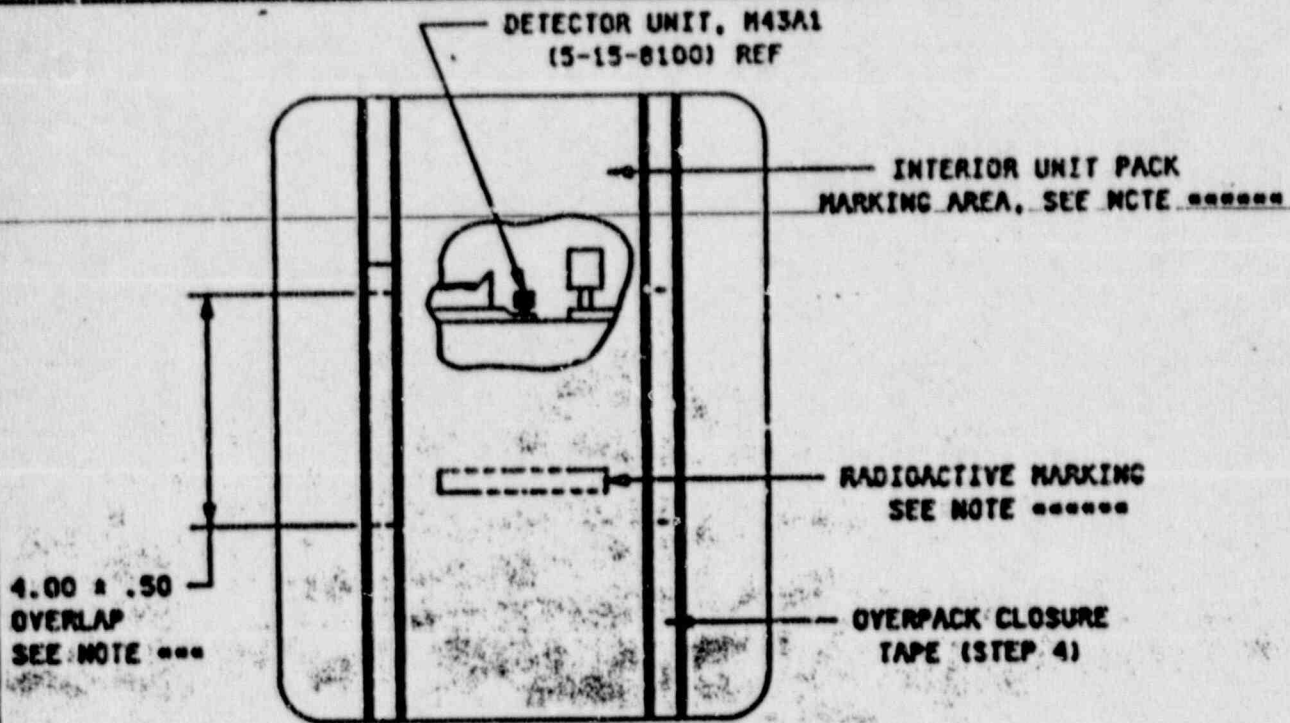
SPECIAL PACKAGING INSTRUCTIONS (CONTINUED)

NATIONAL STOCK NUMBER

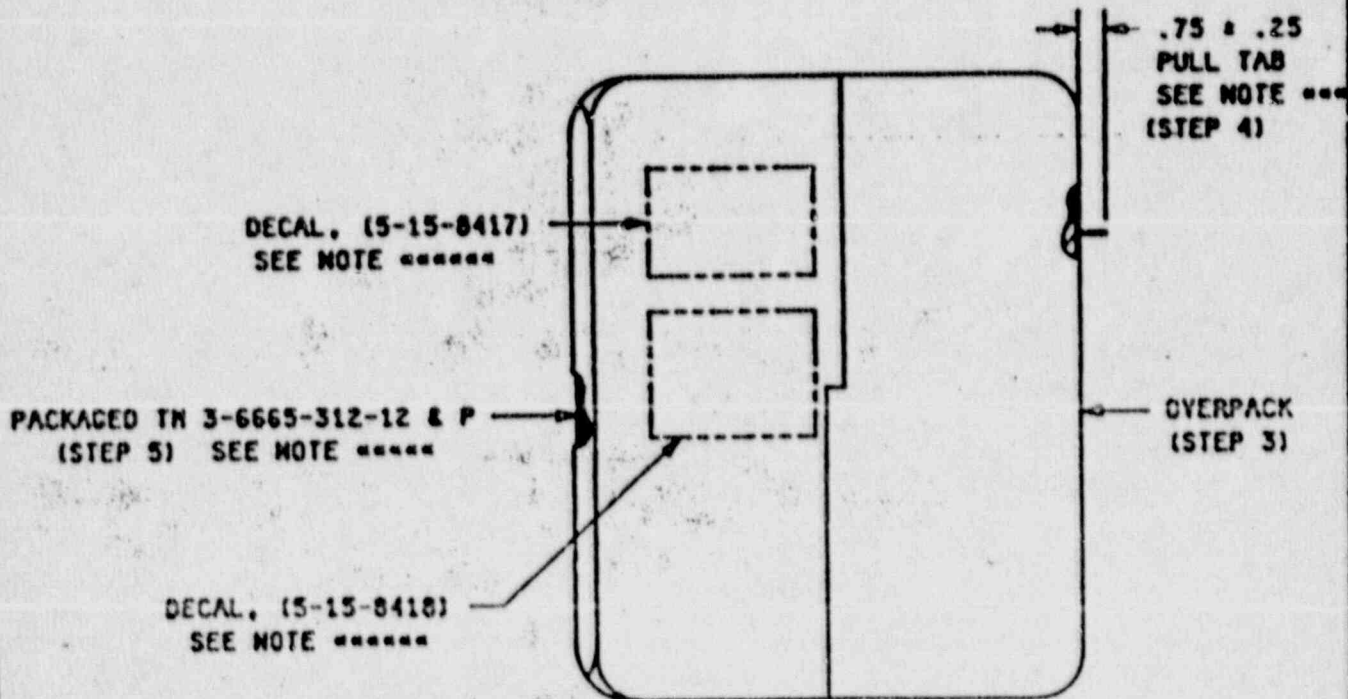
6665-01-081-8140

SPI NUMBER (PIN)

P5-15-8100



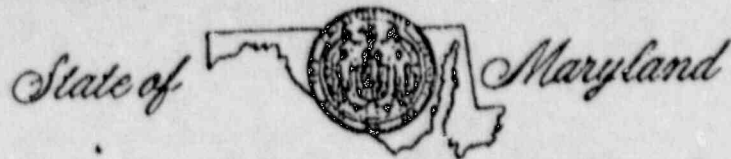
SKETCH 1



SKETCH 2

SCALE: NONE
DRAWING FOR REFERENCE ONLY

NOMENCLATURE	DETECTOR UNIT CHEMICAL AGENT AUTOMATIC ALARM: M43A1	PAGE NUMBER 4	NUMBER OF PAGES 4
--------------	--	------------------	----------------------



DEPARTMENT OF THE ENVIRONMENT
 ASSISTANT SECRETARIAT FOR
 TOXICS, ENVIRONMENTAL SCIENCE AND HEALTH
 CENTER FOR RADIOLOGICAL HEALTH
 RADIOACTIVE MATERIAL LICENSE

Page 1 of 1 pages

Supplementary Sheet

License No. MD-05-012-01

Amendment No. 14

Environmental Technologies Group, Inc.
 1400 Taylor Avenue
 P.O. Box 9840
 Baltimore, Maryland 21284-9840

In accordance with letter dated October 21, 1988 Radioactive Material License Number MD-05-012-01 is amended as follows:

The licensee's name is changed from: Bendix Environmental Systems Division
 to: Environmental Technologies Group, Inc.

FOR THE MARYLAND DEPARTMENT OF THE ENVIRONMENT

Roland H. McLoche
 ADMINISTRATOR, CENTER FOR RADIOLOGICAL HEALTH

Date October 21, 1988
 CRF/jpw

607



DEPARTMENT OF HEALTH AND MENTAL HYGIENE
 OFFICE OF ENVIRONMENTAL PROGRAMS
 201 WEST PRESTON STREET
 BALTIMORE 21201

**DIVISION OF RADIATION CONTROL
 RADIOACTIVE MATERIAL LICENSE**

Page 1 of 1 pages

Supplementary Sheet

License No. MD-05-012-01	Amendment No. 13
--------------------------	------------------

Bendix Environmental Systems Division
 1400 Taylor Avenue
 P.O. Box 9840
 Baltimore, Maryland 21284-9840

In accordance with letter dated December 8, 1986 Radioactive Material License Number MD-05-012-01 is amended as follows:

Item 7E is amended to read: Foils (Amersham Code Numbers NBC.14, NBC.15, NBC.11 and NEN Code No. NER-004) and electroplated devices (Amersham or NEN per Bendix Part No. 5-15-11143).

Date December 17, 1986

For the Maryland Department of Health and Mental Hygiene
Daniel H. Resky, Jr.
 Administrator, Community Health Management Program

RGF/amc
 DMHM-300-6 (Supp.) (10/85)



DEPARTMENT OF HEALTH AND MENTAL HYGIENE
 * OFFICE OF ENVIRONMENTAL PROGRAMS
 201 WEST PRESTON STREET
 BALTIMORE 21201

* DIVISION OF RADIATION CONTROL

RADIOACTIVE MATERIAL LICENSE

Page 1 of 4 pages

Pursuant to the Maryland Radiation Act, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Maryland State Department of Health and Mental Hygiene, now or hereinafter in effect and to any conditions specified below. In accordance with application dated December 26, 1985, Radioactive Material License MD-05-012-01 is amended in its entirety.

1. Name Bendix Environmental Systems Division 1400 Taylor Avenue 2. Address P.O. Box 9840 Baltimore, Maryland 21284-9840	LICENSEE 3. License No. MD-05-012-01
	4. Amendment No. 12
	5. Expiration Date November 30, 1991

6. Radioactive material (element and mass number) A. Americium-241 B. Americium-241 C. Radium-226	7. Chemical and/or physical form A. Sealed source (IAEA drawing #ARC 8432/S) B. Foils C. Sealed source (Radiochemical Center model RAR-2)	8. Maximum amount of radioactivity which licensee may possess at any one time A. No source to exceed 250 microcuries; Total possession 1.5 curies B. No source to exceed 300 microcuries; Total possession 10 millicuries C. 10 microcuries
--	--	--

9. Authorized Use

- A. For the manufacture and distribution of devices or analytical instruments in accordance with COMAR 10.14.02 Section C.28(d) to persons generally licensed under Section C.22(d).
- B. Development of analytical instruments.
- C. For use in LKB model 1217 liquid scintillation counter as external standard.



DEPARTMENT OF HEALTH AND MENTAL HYGIENE
OFFICE OF ENVIRONMENTAL PROGRAMS
201 WEST PRESTON STREET
BALTIMORE 21201

DIVISION OF RADIATION CONTROL
***RADIOACTIVE MATERIAL LICENSE**

Page 2 of 4 pages

Supplementary Sheet

License No. MD-05-012-01

Amendment No. 12

CONT'D

6. Radioactive material
(element and mass
number)

7. Chemical and/or
physical form

8. Maximum amount of
radioactivity which
licensee may possess at
any one time

D. Hydrogen-3

D. Gaseous lightsource
(SDRL #1242/G/150)

D. No source to exceed
500 millicuries;
Total possession
10 curies

E. Nickel-63

E. Foils (Amersham
Allied Bendix part
No. 5-15-11143)

E. No source to exceed
25 millicuries;
Total possession -
3 curies

F. Nickel-63

F. Sealed source (NEN
Model NER-004R;
NEN specification
No. 13-502)

F. No source to exceed
15 millicuries
Total possession
45 curies

9. Authorized use

D. For use in Graseby Dynamics Ltd., CAM gas detectors.

E. Development of analytical instruments for atmospheric contamination monitoring.

F. For the manufacture and distribution of analytical instruments to specifically licensed recipients.

For the Maryland Department of Health
and Mental Hygiene

Date _____

Administrator Community Health Management Program

DIVISION OF RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE

Page 3 of 4 pages

Supplementary Sheet

License No.	MD-05-012-01	Amendment No.	12
-------------	--------------	---------------	----

CONDITIONS

10. The authorized place of use is the licensee's address stated in Item 2.
11. A. The radiation protection program shall be under the supervision of Harry W. Barrick.
B. Radioactive material shall be used by, or under the supervision of Harry W. Barrick, Edward Kirk, Glenn Spangler, and/or Robert C. Davis.
12. The licensee shall comply with provisions of Part D. "Standards for Protection Against Radiation" and Part J, "Notices, Instructions and Reports to Workers; Inspections" of the Maryland Regulations 10.14.02 "Ionizing Radiation Protection".
13. A. Each sealed source containing radioactive material, other than Hydrogen-3 with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed 6 months. In the absence of a certificate from a transferor indicating that a test has been made within six (6) months prior to the transfer, the sealed source shall not be put into use until tested. If there is reason to suspect that a sealed source might have been damaged, or might be leaking, it shall be tested for leakage before further use.
B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of a device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate.
C. Records of leak tests shall be kept in units of microcuries and maintained for inspection by the Department.
D. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Department regulations. A report shall be filed within five (5) days of the test with the Director of Radiation Control, 201 West Preston Street, Baltimore, Maryland 21201 describing the equipment involved, the test results, and the corrective action taken.

For the Maryland Department of Health
and Mental Hygiene

Administrator, Community Health Management Program

DIVISION OF RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE

Page 4 of 4 pages

Supplementary Sheet

License No.	Amendment No.
MD-05-012-01	12

CONDITIONS CONT'D

- E. Test for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Department, the U.S. Nuclear Regulatory Commission or another Agreement State to perform such services.
14. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Department, and shall include the quantities and kinds of radioactive material, location of sealed sources, and the date of the inventory.
15. The licensee shall report to the Department all transfers of the devices distributed under this license to persons generally licensed under Section C.22(d). Such report shall identify each general licensee by name and address, the type of device transferred, the quantity and type of radioactive material contained in the device, and the specific location where each device is installed. The report shall be submitted within 30 days after the end of each calendar quarter in which any such device is transferred to a generally licensed person.
16. The licensee shall test each device distributed under this license for leakage or contamination of radioactive material and proper operation of the "on-off" mechanism and indicator if any, at the time of installation of the device.
17. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material authorized by this license in accordance with statements representations, and procedures contained in application dated December 26, 1985 and letters with attachments dated September 16, 1986 and letter dated September 29, 1986. COMAR 10.14.02 "Ionizing Radiation Protection" regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

Date November 12, 1986

RHF
RGE/amc

DMHM 300-6 (Supp 1) (10/85)

For the Maryland Department of Health
and Mental Hygiene

Daniel H. Keeley Jr.
Administrator, Community Health Management Program

110229

OFFICIAL RECORD COPY ML 10

FEB 06 1989



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FEB 23 1989

Inframetrics, Inc.
ATTN: Yona Wieder, Vice President
Military Programs
16 Esquire Road
Billerica, MA 01862

REFUND OF APPLICATION FEE

1. BACKGROUND:

Check Received February 9, 1989
Application Dated February 3, 1989
Check Number 11694
Check Amount \$300

2. REFUND:

Amount \$70

This refund is now being processed and will be sent as soon as possible.

3. REASON FOR REFUND:

Overpayment of application fee for application dated February 3, 1989 for a materials license, as specified in fee Category 3P (\$230) of Section 170.31, 10 CFR 170.

(15)
Glenda Jackson 2/23/89
License Fee Management Branch
Division of Accounting and Finance
Office of the Controller

