

NRC Form 313 I (12-81) 10 CFR 30		U.S. NUCLEAR REGULATORY COMMISSION		1. APPLICATION FOR: <i>(Check and/or complete as appropriate)</i>	
APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL				<input checked="" type="checkbox"/>	To replace #13-13769-01 a. NEW LICENSE #13-13408-01
<i>See attached instructions for details.</i> Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.				<input type="checkbox"/>	b. AMENDMENT TO: LICENSE NUMBER
				<input type="checkbox"/>	c. RENEWAL OF: LICENSE NUMBER
2. APPLICANT'S NAME <i>(Institution, firm, person, etc.)</i> INDIANA DEPARTMENT OF CIVIL DEFENSE TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (317) 232-3830			3. NAME AND TITLE OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION Mr. Gerald W. Glaze, Radiation Safety Officer TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (317) 232-6878		
4. APPLICANT'S MAILING ADDRESS <i>(Include Zip Code)</i> <i>(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)</i> Indiana Dept. of Civil Defense Room 90-B, State Office Building 100 North Senate Avenue Indianapolis, Indiana 46204			5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED <i>(Include Zip Code)</i> Indiana Department of Civil Defense City Building, 300 East Pike Street Crawfordsville, Indiana 47933		
(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)					
6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL <i>(See Items 16 and 17 for required training and experience of each individual named below)</i>					
FULL NAME			TITLE		
a. Mr. Ron Hudson			Working Leader, Radiation Instrument Technician		
b. Mr. Jon Foster			Radiation Instrument Technician		
c. Mr. David Yount			Radiation Instrument Technician		
7. RADIATION PROTECTION OFFICER Gerald William Glaze, RADEF Officer			Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.		
8. LICENSED MATERIAL					
L I N E NO.	E L E M E N T A	C H E M I C A L B	N A M E C	M A X I M U M D	
	E L E M E N T A M A S S N U M B E R	C H E M I C A L A N D O R P H Y S I C A L F O R M	N A M E O F M A N U F A C T U R E R A N D M O D E L N U M B E R <i>(If Sealed Source)</i>	M A X I M U M N U M B E R O F M I L L I C U R I E S A N D O R S E A L E D S O U R C E S A N D M A X I M U M A C T I V I T Y P E R S O U R C E W H I C H W I L L B E P O S S E S S E D A T A N Y O N E T I M E	
(1)	Cesium 137	Sealed source	CDV 794 Calibrator	150 curies	
(2)	Cesium 137	Sealed source	Nuclear Chicago CDV-790 Model 1	16 millicuries	
(3)	Cesium 137	Sealed source	CDV-782 3 M Model 4F 6Y	120 millicuries per source set, 50 sets	
(4)	Cobalt 60	Sealed source	CDV-784 or CDV-786 source sets	30 millicuries, 50 sets	
DESCRIBE USE OF LICENSED MATERIAL E					
(1)	Source will be used in CDV-794 Radiological Instrument Calibrator for Civil Defense Instrument Calibration.				
(2)	Source will be used in CDV-790 Radiological Instrument Calibrator for Civil Defense Instrument Calibration.				
(3)	Source will be used in CDV-782 Training Source Set to conduct Civil Defense Training.				
(4)	Sources are used in CDV-784 or CDV-786 training source sets to conduct Civil Defense Training. Scheduled to be turned in to FEMA FY85.				

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 REG3 LIC30
 13-13408-02 PDR

9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED.	NAME OF MANUFACTURER	MODEL NUMBER
	A.	B.	C.
(1)	DCP Model CDV-794/2 Radiological Instrument Calibrator Cesium 137	Technical Operations Inc. Burlington, Mass.	CDV-794-2
(2)	DCP Model CDV-790 Radiological Instrument Calibrator Cesium 137	Nuclear - Chicago	CDV-790 Model 1
(3)	DCP Model CDV-784 or CDV-786 Training Source Set Cesium 137	3 M Model 4F 6Y	CDV-784 or CDV-786
(4)	DCP Model CDV-784 or CDV-786 Training Source Set Cobalt 60		CDV-784 or CDV-786

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT For Leak Test A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	Survey Meter	Wm. B. Johnson & Asso. N.J.	GSM-5	1	Alpha, Beta, Gamma	.02 MR/HR 10 Count/Minute
(2)	Survey Meter CDV 457	Nucleonics Corp. Brooklyn, NY	CDV 457	2	Gamma	.02 MR/HR
(3)	Survey Meter CDV 700			200	Gamma/Beta	
(4)	Survey Meter CDV 715				Gamma	

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY	<input type="checkbox"/> b. CALIBRATED BY APPLICANT <i>Attach a separate sheet describing method, frequency and standards used for calibrating instruments.</i>
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12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input checked="" type="checkbox"/> (1) FILM BADGE Wrist & Body Badges <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input checked="" type="checkbox"/> (3) OTHER (Specify): Dosimeter CDV-138 and CDV-742	U.S. Army Film Badge Service	<input checked="" type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input checked="" type="checkbox"/> OTHER (Specify):

13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)

- ☐ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.
☐ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.
☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.
☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED N/A

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

N/A, U.S. Government Property.

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.

16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
 - a. Principles and practices of radiation protection.
 - b. Radioactivity measurement standardization and monitoring techniques and instruments.
 - c. Mathematics and calculations basic to the use and measurement of radioactivity.
 - d. Biological effects of radiation.

17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

18. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our 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.

a. LICENSE FEE REQUIRED
(See Section 170.31, 10 CFR 170)

N/A U.S. Government Property

(1) LICENSE FEE CATEGORY: N/A

(2) LICENSE FEE ENCLOSED: \$ N/A

b. CERTIFYING OFFICIAL (Signature)

c. NAME (Type or print)

William J. Patterson

d. TITLE Director,
Indiana Department of Civil Defense

e. DATE

AUGUST 17, 1984

8. List by name each radioisotope to be possessed and used under the license. Example:

A	B
(1) Iodine-131	(1) Iodide
(2) Iodine-131	(2) Iodinated Human Serum Albumin
(3) Krypton-85	(3) Gas
(4) Cesium-137	(4) Sealed Source

C	D
(1) Not Applicable	(1) 10 millicuries
(2) N. A.	(2) 1 millicurie
(3) N. A.	(3) 1 millicurie
(4) Iso. Corp Model Z-78	(4) 2 source of 150 millicuries each

Attach additional properly keyed sheets if more space is needed.

- 8.E State the use of each licensed material listed in 8.A, B, C, and D.

9. Description of containers and/or devices in which sealed sources listed in Item 8 will be stored or used. Example:

A	B
(1) #4 - Source housing	Iso. Corp

C
Model Z-278

- 10-18 Self-explanatory. (For those items that do not apply, indicate as N.A. (not applicable).)

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Forms 313M, 313I, or 313R. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
2. **PRINCIPAL PURPOSE(S)** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30-36 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a byproduct material license or amendment thereof.
3. **ROUTINE USES** The information may be used: (a) to provide records to State health departments for their information and use; and (b) to provide information to Federal, State, and local health officials and other persons in the event of incident of exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for a NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you. A copy of the license issued will routinely be placed in the NRC's Public Document Room, 1717 H Street, N. W., Washington, D.C.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION** Disclosure of the requested information is voluntary. If the request information is not furnished, however, the application for byproduct material license, or amendment thereof, will not be processed.
5. **SYSTEM MANAGER(S) AND ADDRESS** Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

INSTRUCTIONS FOR PREPARATION OF APPLICATION FOR BYPRODUCT MATERIAL LICENSE

NRC FORM 313 (I)

GENERAL INFORMATION

An applicant for a "Byproduct Material (Radioisotopes) License," should complete NRC Form 313 (I) in detail and submit in duplicate to the U.S. Nuclear Regulatory Commission. The applicant should endeavor to cover his entire radioisotope program with one application, if possible. However, separate applications should be submitted for gamma irradiators. Applications for medical uses should be submitted on NRC Form 313 (M) and applications for use of sealed sources in radiography should be submitted on NRC Form 313R. Supplemental sheets may be appended when necessary to provide complete information. *Item 18 must be completed on all applications. Submission of an incomplete application will often result in a delay in issuance of the license because of the correspondence necessary to obtain information requested on the application.*

NOTE. -When the application includes one of the special uses listed below, the applicant should request the appropriate pamphlet which provides additional instructions:

1. Industrial Radiography—"Licensing Requirements for Industrial Radiography" (use application NRC Form 313R for Radiography);
2. Laboratory and Industrial Uses of Small Quantities—"Guide for Preparation of Applications for Laboratory and Industrial Uses of Small Quantities of Byproduct Material."

3. Broad License (research and development)—"Licensing Guide for Type-A Licenses of Broad Scope for Research and Development;"

4. Licensing Guides for the performance of well logging operations.

5. Licensing guide for the use of sealed sources in portable and semi-portable gauging devices.

The Commission charges fees for filing of applications for licenses as specified in Section 170.12, Title 10, Code of Federal Regulations, Part 170. The applicant should refer to Section 170.31, *Schedule of fees for materials licenses*, to determine what fee should accompany the application. No action can be taken on applications until fees are paid. Checks or money orders should be made payable to the U.S. Nuclear Regulatory Commission.

Two copies of the completed NRC Form 313 (I) and two copies of each attachment thereto, should be sent to the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. One copy should be retained for the applicant's file. Applications may also be filed in person at the Commission's office at 1717 H Street, N.W., Washington, D.C. or at 7915 Eastern Avenue, Silver Spring, Maryland.

EXPLANATION OF FORM NRC-313 (I)

NRC Form 313 (I) is designed for use in supplying information on programs of varying complexity. The applicant should provide complete information on his proposed program for the possession and use of licensed material. For those items that do not apply, indicate as N.A. (not applicable).

Item No.

1. Self-explanatory
2. The "applicant" is the organization or persons legally responsible for possession and use of the licensed materials specified in the application.
3. Self-explanatory
4. Self-explanatory

5. The actual sites of use should be listed as indicated. Permanent facilities such as field offices for portable gauges or devices should be identified in Item 5 by Street, Address, City and State. Temporary field locations of use should be specified as "temporary job sites of the applicant" and list the States throughout which the temporary job sites will be located. Attach additional properly keyed sheet if more space is needed.

6. Self-explanatory

7. The "Radiation Protection Officer" is the named individual who is expected to coordinate the safe use of the licensed material specified in the application and who will ensure compliance with the applicable parts of Title 10, Code of Federal Regulations.

ITEM 10. RADIATION DETECTION INSTRUMENTS

Type of Instruments	Number Available	Radiation Detected	Sensitivity Range	Window Thickness	Use
Johnson ASP-2A Scintillation Probe	1	Alpha	High Sensitivity, Low Background 25-40% Efficiency	Copper Etched Screen (90% open area), Pin Hole Free Mylar, Johnson APT-3 Phosphor	Monitoring, Surveying
Johnson GSM-5 Survey	1	-----	0.2, 2.0 and 20 Mr/hr 0-500, 0-5000, and 0-50,000 cpm	-----	Survey
Johnson ASA-2	1	-----	-----	-----	Audio Amplifier
Johnson J-200 End Window GM Tube	1	Alpha, Beta, Gamma	22,500 and 27,500 cpm when exposed to 10 Mr/ hr field of radium	Minimum 1.0 mg/cm ² Maximum 2.0 mg/cm ²	Monitoring, Surveying
Victoreen CDV-715	2	Gamma	0-500 r/hr	100 mg/cm ²	Monitoring Surveying
Victoreen CDV-700	2	Beta, Gamma	0-50 mr/hr	30 mg/cm ²	Monitoring Surveying
Nuclear Equipment Chemical Corp. Scaler with End Window	1	Alpha, Beta, Gamma	Assay	1.4 mg/cm ²	Measuring
Nuclear Equipment Chemical Corp. Holder Support Lead with sample trays	1	-----	-----	-----	Counting Chamber
Victoreen CDV-138	20	Gamma	0-200 mr	-----	Total Dose
Victoreen CDV-750	2	-----	-----	-----	Read and zero CDV-138
Victoreen CDV-700M	2	Beta, Gamma	25 cpm	1.4 mg/cm ²	Monitoring, Surveying
U.S. Army Film Badge	6	Gamma	-----	-----	Total Dose

ITEM 10. RADIATION DETECTION INSTRUMENTS (Continued)

The previous instruments are available at the Radiological Instrument Maintenance Facility, 300 East Pike Street, City Building, Crawfordsville, Indiana, 47933.

ITEM 11. METHOD, FREQUENCY, AND STANDARDS USED IN
CALIBRATING INSTRUMENTS LISTED IN ITEM 10.

CDV-715's will be calibrated approximately annually by CDV-794/2 Calibrator.

CDV-700 will be calibrated approximately annually by the CDV-790 Calibrator.

Johnson equipment is calibrated annually by Southeastern Atomic Laboratories,
1354 N.W. 53rd Avenue, Gainesville, Florida.

ITEM 12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY
PROCEDURES USED

Film badges will be worn by the calibrator operator during operation of the calibrator. Film badges are supplied on a monthly basis from:

U.S. Army
Ionizing Radiation Dosimetry Center
ATTN: DRSMI-MCI-DCS
Lexington, Kentucky, 40511
(606) 293-3646

ITEM 16 TYPE OF TRAINING

Part A - Gerald W. Glaze

Part B - Ronald D. Hudson

Part C - Jon L. Foster

Part D - David A. Yount

(Item 16. Type of Training)

PART A

THE FOLLOWING IS A LIST OF TRAINING RECEIVED BY GERALD W. GLAZE WHICH RELATES TO PRINCIPLES AND PRACTICES OF RADIATION PROTECTION, RADIOACTIVITY: MEASUREMENT STANDARDIZATION AND MONITORING TECHNIQUES AND INSTRUMENTS, MATHEMATICS AND CALCULATIONS BASIC TO THE USE AND MEASUREMENT OF RADIOACTIVITY AND BIOLOGICAL EFFECTS OF RADIATION.

NUCLEAR EFFECTS TRAINING (Basic, Fort Bragg, North Carolina, Division CBR Training Team, December 1958.

ATOMIC WEAPONS SYSTEM DELIVERY OFFICER, (Davy Crocket) Training, February - March, 1965, Fort Benning, Georgia.

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL BATTALION DEFENSE OFFICER TRAINING (Advanced); June - August 1965, Fort Knox, Kentucky.

DIVISION NUCLEAR, BIOLOGICAL, AND CHEMICAL STAFF OFFICER TRAINING, 1969, Fort Knox, Kentucky.

BACHELOR OF SCIENCE, BUSINESS ADMINISTRATION, 1972, University of Tampa, Tampa, Florida.

MASTER OF ARTS, History, Marshall University, Huntington, West Virginia, 1974.

RADIATION EMERGENCY RESPONSE OPERATIONS, Las Vegas, August 1979.

RADIATION MONITOR TRAINING, Indianapolis, Indiana, January 1980.

RADIOLOGICAL DEFENSE OFFICER, Bloomington, Indiana, July 1980.

RADIOLOGICAL EMERGENCY PLANNING in response of a Nuclear Power Plant Incident Louisville, Kentucky, February 1980.

RADIOLOGICAL ASSESSMENT in response to a Nuclear Power Plant Incident, February, 1981, Chicago, Illinois.

2ND NATIONAL RADIOLOGICAL DEFENSE OFFICER CONFERENCE, Emmitsburg, Maryland, August 1981.

STATE BOARD OF HEALTH RESPONSE COMMITTEE, Nuclear Power Response Training, Marble Hill, Indiana, November 1981.

(Item 16. Type of Training)

PART B

THE FOLLOWING IS A LIST OF TRAINING RECEIVED BY RONALD D. HUDSON WHICH RELATES TO PRINCIPLES AND PRACTICES OF RADIATION PROTECTION, RADIOACTIVITY MEASUREMENT STANDARDIZATION AND MONITORING TECHNIQUES AND INSTRUMENTS, MATHEMATICS AND CALCULATIONS BASIC TO THE USE AND MEASUREMENT OF RADIOACTIVITY, AND BIOLOGICAL EFFECTS OF RADIATION.

MATH 151, 151A, 223: Purdue University, Electronics Engineering Technology, West Lafayette, Indiana, 1967-1969 (3 Credit Hour Courses Each).

GENERAL PHYSICS-MECHANICS, HEAT & SOUND: Purdue University, Electronics Engineering Technology, West Lafayette, Indiana, 1967 (5 Hour Course).

GENERAL PHYSICS-LIGHT, ELECTRICITY, & MAGNETISM: Purdue University, Electronics Engineering Technology, West Lafayette, Indiana, 1968 (5 Hour Course).

FIELD RADIO MECHANIC: U.S. Army, Fort Sill, Oklahoma, July-September 1969 (10 Weeks).

COMMUNICATIONS CHIEF: U.S. Army, Fort Sill, Oklahoma, October 1969-April 1970, (26 Weeks).

HS-3/RM-8 RADIOLOGICAL MONITORING COURSE: DCPA Staff College, Battle Creek, Michigan, 1975 (16 Hours).

CIVIL DEFENSE, U.S.A.: DCPA Staff College, Battle Creek, Michigan, 1975.

ELECTRONICS TECHNOLOGY: Cleveland Institute of Electronics, Cleveland, Ohio, 1973-1976 (Math was a constant factor in this course).

BASIC CONCEPTS OF CIVIL PREPAREDNESS RADIATION CONTROL (RADEF I): DCPA sponsored course presented by the Indiana Department of Civil Defense, Bloomington, Indiana, August 1976.

RADIOLOGICAL DEFENSE OFFICER (RADEF II): DCPA sponsored course presented by the Indiana Department of Civil Defense, Bloomington, Indiana, August 1976.

RADIOLOGICAL INSTRUCTOR WORKSHOP (RADEF III): DCPA sponsored course presented by the Indiana Department of Civil Defense, Bloomington, Indiana, August 1976.

HAZARDOUS MATERIALS EMERGENCY WORKSHOP: Sponsored by the Indiana Department of Civil Defense and Department of Transportation, Bloomington, Indiana, August 1976.

RADIOLOGICAL EMERGENCY RESPONSE OPERATION (Response to Nuclear Power Plant Incidents), sponsored by U.S. Nuclear Regulatory Commission, Minneapolis, Minnesota, December 5 - 9, 1977.

(Item 16. Type of Training)

PART C

THE FOLLOWING IS A LIST OF TRAINING RECEIVED BY JON L. FOSTER WHICH RELATES TO PRINCIPLES AND PRACTICES OF RADIATION PROTECTION, RADIOACTIVITY MEASUREMENT STANDARDIZATION AND MONITORING TECHNIQUES AND INSTRUMENTS, MATHEMATICS AND CALCULATIONS BASIC TO THE USE AND MEASUREMENT OF RADIOACTIVITY, AND BIOLOGICAL EFFECTS OF RADIATION.

U.S. ARMY RESERVES - Radio operator and technician - 1953.

ARMY - Active for 2 years, received training in addition to radio technician and extensive training in weapons and demolition.

1958 - 1981 Held three different technician jobs in radio, television, and personal protection alarm systems. Several Courses of instruction were successfully completed during this period of time:

SHELTER MANAGEMENT INSTRUCTORS COURSE, Indiana Department of Civil Defense and Emergency Management, June 22, 1981

RADIOLOGICAL MONITORING, DCPA Staff College, Battle Creek, Michigan, 12-11-76.

AMATEUR RADIO OPERATOR, Active in ARRL Civil Defense Races. 3-13-76.

RADIOLOGICAL DEFENSE OFFICER, DCPA Sponsored Course, presented by the Indiana Department of Civil Defense, Crawfordsville, Indiana. 5-20-81.

EMERGENCY MEDICAL SERVICE TRAINING, 40 hours, Crawfordsville Fire Department, Emergency Medical Technicians. 12-81.

EMERGENCY OPERATIONS SIMULATED TRAINING, September 30, 1981.

HAZARDOUS MATERIALS EMERGENCY WORKSHOP, Sponsored by the Indiana Department of Civil Defense and Department Transportation, Crawfordsville, Indiana. 6-23-77.

EXTRICATION TRAINING SEMINAR, Indiana Department of Civil Defense, Crawfordsville, 4 hours, 6-10-77.

CRASH AND INJURY, Indiana Department of Civil Defense, Crawfordsville, 8-4-77.

BOMB THREAT AND SEARCH PROCEDURES SEMINAR, 64th E.O.D., Fort Benjamin Harrison, Indiana, 5-10-80.

RADIATION SAFETY, Indiana University Medical Center, 9-16-83

(Item 16 Type of training)

PART D

THE FOLLOWING IS A LIST OF TRAINING RECEIVED BY DAVID A. YOUNT WHICH RELATES TO PRINCIPLES AND PRACTICES OF RADIATION PROTECTION, RADIOACTIVITY MEASUREMENT STANDARDIZATION AND MONITORING TECHNIQUES AND INSTRUMENTS, MATHEMATICS AND CALCULATIONS BASIC TO THE USE AND MEASUREMENT OF RADIOACTIVITY, AND BIOLOGICAL EFFECTS OF RADIATION.

BASIC ELECTRICITY AND ELECTRONICS, U.S. Navy, NATTC, Memphis, Tennessee, Math a constant factor, July 1974, 50 hours..

AVIONICS A SCHOOL, U.S. Navy, NATTC, Memphis, Tennessee, Math a constant factor, August 1974 - December 1974.

ADVANCED FIRST TERM AVIONICS, U.S. Navy, NATTC, Memphis, Tennessee, Math a constant factor, January 1975 - April 1975.

NON ACOUSTIC SENSORS TRAINING (Radar, Infrared), Math a constant factor, August 1975 - September 1975, 8 weeks, U.S. Navy, NAS, North Island, NAMTD, California.

COMMUNICATION AND NAVIGATION TRAINING, August 1976 - September 1976, 8 weeks, U.S. Navy, NAS, North Island, NAMTD, California.

NUCLEAR WEAPONS HANDLING AND LOADING TRAINING, NUWEPSTRAPAC, U.S. Navy, NAS, North Island, California. 1976

EMERGENCY MEDICAL TECHNICIAN (Ambulance), August 1976 - May 1977, San Diego Evening College.

RADIOLOGICAL MONITORING COURSE, January 1969, 16 hours.

RADIOLOGICAL DEFENSE OFFICER COURSE, Indiana Department of Civil Defense, March 1982.

EMERGENCY OPERATIONS OFFICER COURSE, Indiana Department of Civil Defense, December 1982.

SHELTER MANAGER INSTRUCTOR COURSE, Indiana Department of Civil Defense, January 1983.

RADIOLOGICAL DEFENSE INSTRUCTORS WORKSHOP, Indiana Department of Civil Defense, January 1983.

FIELD ENGINEERING OFFICER, Indiana Department of Civil Defense, February 1983.

RADIATION HEALTH PHYSICS, Indiana University School of Medicine, September 1983.

ITEM 17. EXPERIENCE WITH RADIATION

Part A - Gerald W. Glaze

Part B - Ronald D. Hudson

Part C - Jon L. Foster

Part D - David A. Yount

(Item 17. Experience With Radiation)

PART A

THE FOLLOWING IS A SUMMATION OF EXPERIENCE WITH RADIATION AS GAINED BY GERALD W. GLAZE.

NUCLEAR EFFECTS INSTRUCTOR (Basic), Howe Military School, Howe, Indiana, January 1960 - October 1964.

DEPARTMENT OF DEFENSE, Chemical, Biological and Radiological Response Team Leader (Kentucky, Indiana, Ohio, Michigan, Illinois, and West Virginia) Fort Knox, Kentucky, August 1965 - September 1967.

BATTALION CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL INSTRUCTOR; Fort Knox, Kentucky, August 1965 - February 1967.

ASSISTANT PROFESSOR OF MILITARY SCIENCE NUCLEAR WEAPONS EFFECTS, Marshall University, September 1972 - July 1975.

25TH DIVISION G-3 OPERATIONS STAFF OFFICER FOR NUCLEAR WEAPONS COUNTER MEASURES, training for 3rd Brigade. November 1975 - August 1977, Schofield Barracks, Hawaii.

ADVISOR TO TRAINING DEVELOPMENT FOR DEPARTMENT OF DEFENSE DECONTAMINATION TEAM PERSONNEL for Anewetock Clean-up operations, 1975-1976.

PRIMARY STAFF ADVISOR AND SENIOR INSTRUCTOR for Nuclear Biological and Radiological Training for Fort Benjamin Harrison, Indiana, August 1977 - August 1979.

(Item 17. Experience With Radiation)

PART B

THE FOLLOWING IS A SUMMATION OF EXPERIENCE WITH RADIATION AS GAINED BY RONALD D. HUDSON:

Experience in the use and handling of radioactive material was gained using 30 millicuries of Cobalt-60 in instrument exercises conducted during the RADEF I, II, and III courses that were sponsored by DCPA and presented by the Indiana Department of Civil Defense in Bloomington, Indiana.

Further experience with radiation was gained as a result of using the CDV-786 Cobalt-60 sealed source set in training radiological monitors in the use of radiation detection/measuring devices and radiation exposure using dosimetry devices.

Experience with radiation was also gained by using the CDV-794/2 calibrator in calibrating radiation detection/measuring instruments under the supervision of the state radiation protection officer.

Other experience with radiation is in the use and handling of low to intermediate quantities of radioactive material in the form of sealed test sources and operational check sources used to determine the operability and calibration of lower level radiation survey meters.

Experience was also gained by performing periodic leak tests of the statewide Cobalt-60 sealed source set inventory.

My on-the-job training consists of nine years with the Indiana Department of Civil Defense-RIMC beginning March 10, 1975 as an Electronics Technician with the purpose of repair and calibration of the radiation detection/measuring instruments using basic electronic lab tools and test instruments in the repair and maintenance of the radiological instrumentation inventory and using the CDV-794/2 Cesium-137 sealed source calibrator under the supervision of the state radiation protection officer.

I am currently the senior technician and supervisor of the Radiological Systems Maintenance Shop.

(Item 17. Experience With Radiation)

PART C

THE FOLLOWING IS A SUMMATION OF EXPERIENCE WITH RADIATION AS GAINED BY
JON L. POSTER.

My on-the-job training consists of four months with the Indiana Department of Civil Defense, Radiological Systems Maintenance Division, beginning October 26, 1981, as an electronics technician with the purpose of repair and calibration of the radiation detection/measuring instruments using basic electronic lab tools and test instruments in the repair and maintenance of the radiological instrumentations inventory and using the CDV-794/2 Cesium-137 sealed source calibrator under the supervision of the supervisor of the Radiological Systems Maintenance Shop.

Other experience with radiation is in the use and handling of low to intermediate quantities of radioactive material in the form of sealed test sources and operational check sources used to determine the operability and calibration of lower level radiation survey meters.

Experience was gained by performing periodic leak tests of the state-wide cobalt-60 sealed source set inventory.

Experience was gained during Emergency Operations Simulated Training, September 30, 1981

(Item 17. Experience With Radiation)

PART D

THE FOLLOWING IS A SUMMATION OF EXPERIENCE WITH RADIATION AS GAINED BY DAVID A. YOUNT.

My on-the-job training consists of four months with the Indiana Department of Civil Defense, Radiological Systems Maintenance Division, beginning November, 1981, as an electronics technician with the purpose of repair and calibration of the radiation detection/measuring instruments using basic electronic lab tools and test instruments in the repair and maintenance of the radiological instrumentations inventory and using the CDV-794/2 Cesium-137 sealed source calibrator under the supervision of the supervisor of the Radiological Systems Maintenance Shop.

Other experience with radiation is in the use and handling of low to intermediate quantities of radioactive material in the form of sealed test sources and operational check sources used to determine the operability and calibration of lower level radiation survey meters.

Experience was gained by performing periodic leak tests of the state-wide Cobalt-60 sealed source set inventory.

CDV - 794/2
High Range Survey Instrument Calibrator
143 Curies Cesium-137

ITEM 13. FACILITIES

The CDV-794/2 Radiological Instrument Calibrator will be located in the Maintenance Shop. The attached sketch will show position of the calibrator with respect to the general work areas.

The equipment and materials will be located in the Radiological Instrument Repair Shop located at:

Indiana Department of Civil Defense
Radiological Instrumentation Maintenance & Calibration
300 East Pike Street
City Building
Crawfordsville, Indiana 47933

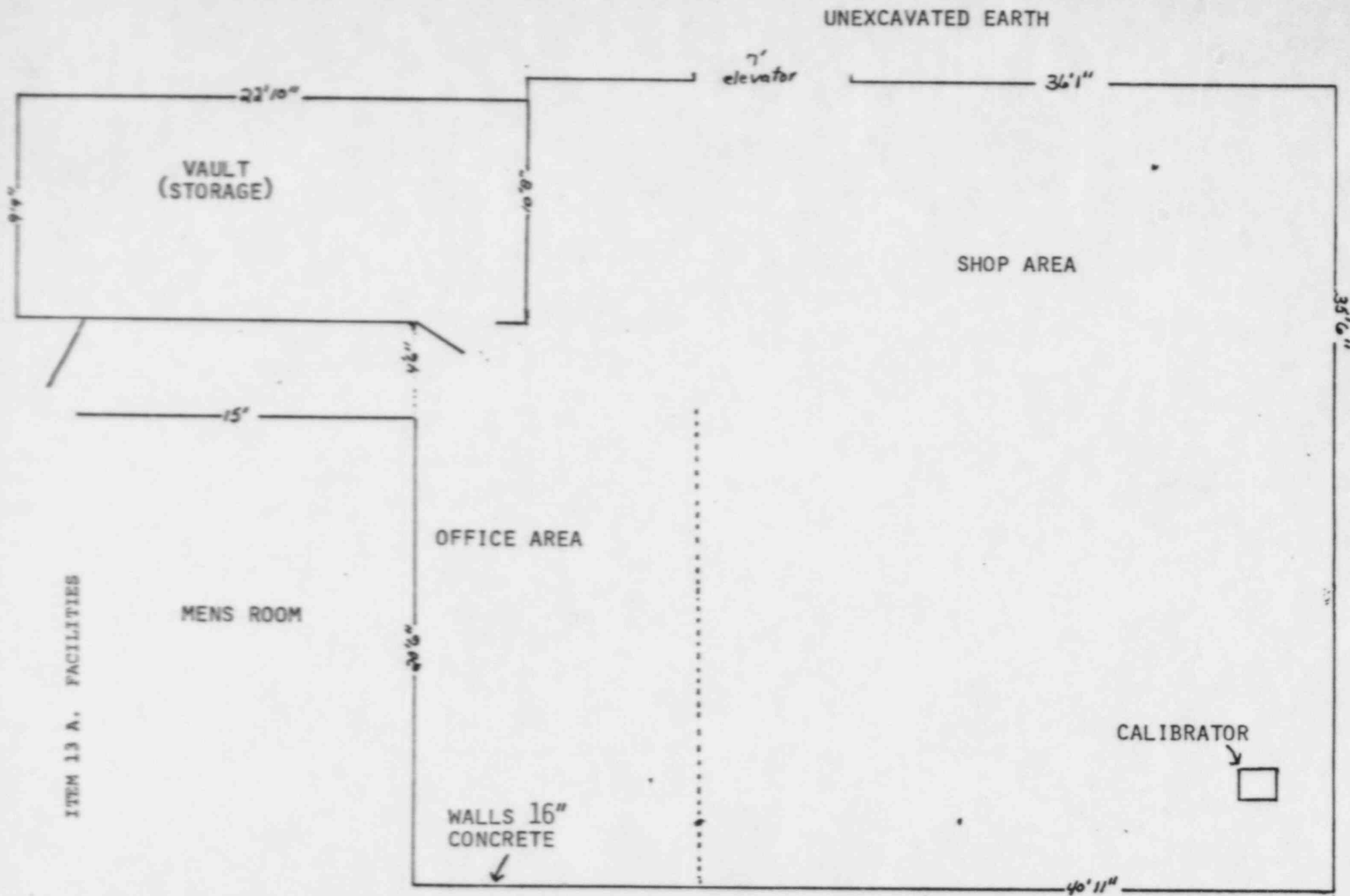
The following equipment is available in the Radiological Instrument Repair Shop

<u>QUANTITY</u>	<u>NOMENCLATURE</u>
1	GSM-5 Johnson Survey Meter
1	ASP-2A Johnson Alpha Scintillation Probe
1	J-2-- Johnson, Alpha, Beta, Gamma End Window GM Tube
1	ASA-2 Johnson Audio Amplifier
2	CDV-700M Survey Meter, modified; has 1.4-2 mg/cm ² Mica End Window GM Tube
2	CDV-700 Radiological Survey Meter
2	CDV-715 Radiological Survey Meter
20	CDV-138 O-200 mr Self-reading Pocket Dosimeter
2	CDV-750 Dosimeter Charger
1	CDV-788 18-inch Handling Tongs
1	Scaler and Counting Chamber
6	Film badges

The calibration area is located in the south-east portion of the basement of the City Building in Crawfordsville, Indiana, 300 East Pike Street. The building is office space for many of the city departments such as the police department, fire department, Mayor's office, and Crawfordsville Electric Light & Power. Item 13 A shows a diagram of the Radiological Instrumentation Maintenance & Calibration Facility and adjoining areas. As shown in the diagram, the calibrator is located in the southeast corner of the Radiological Instrumentation Maintenance & Calibration Facility. This location is chosen so to be away from usual office traffic and from the technicians workbench area.

ITEM 13. FACILITIES (Continued)

All walls and ceiling of this facility are reinforced concrete sixteen inches thick. Only authorized personnel are allowed past the office area into the maintenance and calibration area.



Scale 1" = 6'

PIKE STREET

ITEM 14. DISPOSAL OF RADIOACTIVE MATERIAL

Upon termination of the Radiological Instrument Maintenance Program contract or when otherwise necessary, the radioactive source will be returned to a FEMA location as directed by instructions from FEMA Chairman of the Isotope Committee.

ITEM 15: RADIATION PROTECTION PROGRAM
Part A

The CDV-794/2 Radiological Instrument Calibrator will be located in the Calibration Area located in one corner of the Shop. See Item 13.

The door will be posted with signs bearing the standard three-blade propeller design and the words "DANGER-RADIATION AREA" and "CAUTION-RADIOACTIVE MATERIAL". The inside walls of the Calibration Area will be posted with the same types of signs.

Form NRC-3 shall be posted in a conspicuous place accessible to all personnel. A copy of the byproduct material license and 10-CFR, Part 21 shall be posted for the personnel to read.

The area enclosed within the Calibration Area shall be classified as a restricted area, and only authorized personnel will be admitted to this area.

A film badge shall be assigned by serial number and name to each person working in the radiation area on a daily basis. A person or persons who are not permanent facility staff or program members and who may enter the area on an intermittent non-permanent basis will be assigned a visitor's film badge. The film badges will be changed each calendar month and sent to the

U.S. Army
Ionizing Radiation Dosimetry Center
ATTN: DRSMI-MCI-DCS
Lexington, Kentucky, 40511
(606) 293-3646

The CDV-794/2 calibrator will always be housed and operated in the Calibration Area.

The source positioning handwheel will always be locked and the lid assembly closed when not in operation. The Calibration Area will be locked during non-working hours.

The calibration unit will only be operated by personnel previously trained in its operation and under the supervision of the radiation protection officer or an individual user as listed in Item 4 of the basic application.

Radiation exposure of personnel will be limited to that specified in Title 10-Atomic Energy, Chapter 1-Nuclear Regulatory Commission, Part 20, Standards for Protection against Radiation.

In the event of fire or exposure to high temperatures, the area may be contaminated with hazardous levels of radioactive materials, the amount of shielding around the source may be significantly reduced, producing an external radiation hazard. Fires will be extinguished as quickly as possible. The area will be evacuated.

In the event of a fire, personnel over-exposure, release of the radioactive material, or other accidents described in Title 10 of the Code of Federal Regulations, Part 20, Paragraphs 20.402, 20.403, and 20.405, the

ITEM 15. RADIATION PROTECTION PROGRAM (Continued)

following will be notified immediately by telephone and telegraph:

- (1) Nuclear Regulatory Commission
Division of Compliance
Region III
Glen Ellyn, Illinois 60137

Phone: (312) 790-5500
- (2) Mr. Mike Pawlowski
Nucleonics Division
Federal Emergency Management Agency
Donohoe Bldg. Room 608
500 C Street, S.W.
Washington, D.C. 20472

Phone: (202) 287-3855
- (3) Radiological Defense Officer
Federal Emergency Management Agency
Region V
Federal Center
Battle Creek, Michigan 49016

Phone: (616) 968-8142 Ext. 6041

In addition to the telephone and telegraph notification listed above the licensee will make a written report within 30 days to the Division of Material Licensing, U. S. Nuclear Regulatory Commission, Washington, D.C., 20545, with a copy to the Director of Region 3, Division of Compliance, under Paragraphs 20.403 and 20.405 of 10 CFR 20.

Records

The Film Badges will be checked every month and recorded in the film badge ledger. A separate sheet shall be maintained in the book for each individual and will contain all of the information called for in Form AEC-5. Also, there will be a space in the ledger for the individual to place his signature verifying his reading. In the event the individual receives no radiation, a zero entry will be made in the ledger. No erasures will be permitted; in case of error, a line will be drawn through the error, initialed and dated by the individual making the correction. Film badge results will be maintained on file.

Records of radiation surveys shall be maintained and shall indicate the type and serial number of the instrument used to perform the survey, the date, person performing the survey, and the radiation intensity.

ITEM 15. RADIATION PROTECTION PROGRAM (Continued)

Records of wipe test shall be maintained and shall indicate the type and serial number of equipment used to perform the analysis, the date, the person(s) performing the test and the test results, and the date the next wipe test should be performed.

Wipe Tests

The contamination hazard is controlled by containing the cesium source within a system of sealed vessels as described by Section I of the Instruction and Maintenance Manual. The following wipe test procedure will be established to ascertain that sealing has not been impaired. Wipe test smears will be taken of the unsealed end of the source confinement cylinder at intervals of not more than six months. The test will be conducted by the Radiological Protection Officer or personnel of the Radiological Instrumentation Maintenance & Calibration Shop. The following procedure will be followed:

- (1) Lock Radiation-Level Selector Wheel in SAFE position. Observe SAFE green indicator.
- (2) Remove extension power cord from power plug on left end of cabinet.
- (3) Remove access cover on left side of cabinet.
- (4) Place detector of CDV-700 near open access port. PERFORM RADIATION EXPOSURE RATE CHECK.
- (5) Using Whatman No. 50 (or equivalent) filter paper, smear the protruding portion of the source plug container.
- (6) Evaluate the smear with an appropriate G-M counter or a gas flow proportional counter at a known counting efficiency, E cpm-dpm (counts per minute/disintegrations per minute). Convert net count rate to units of microcuries using the appropriate E factor. Compare the results with the allowable limit of 0.005 microcuries activity. If 0.005 microcuries or more of gross Beta Gamma activity is detected immediately notify by telephone or telegraph, the Nucleonics Division of the Federal Emergency Management Agency and the Radiological Defense Officer of the Federal Emergency Management Agency, Region 5. The calibrator area will be cleared of personnel and immediately checked for contamination. All contaminated areas will be restricted from use until cleaned under the supervision of a qualified health physicist, and all requirements of Title 10, Part 20 of the Code of Federal Regulations are satisfied.
- (7) When it is necessary for personnel to enter the area prior to the institution of and during decontamination operations, protective clothing, gloves and footwear will be utilized. If airborne Cs-137 contamination above 1×10^{-8} microcurie per milliliter is present, dust respirators and supplied-air masks will be worn. Contamination control procedures to prevent the spread of radioactive contamination will be utilized with established buffer zones for the changing of contaminated,

ITEM 15. RADIATION PROTECTION PROGRAM (Continued)

protective clothing. Ventilation of the radioactive contaminated area will not be performed without control of the effluent air to prevent spread of contamination. All operations will be carried out under the direct supervision of a qualified health physicist.

- (8) The disposition of a calibrator with a leaking radioactive source will be handled directly by the Federal Emergency Management Agency. No attempt to stop the leakage or to dispose of the source shall be made without the written approval of the Radiation Protection Officer of the Federal Emergency Management Agency, Region 5.
- (9) Record all Wipe Test results in the permanent Wipe Test Record of the Calibrator, and replace the access cover and safety wire the bolts. Records will be available for inspection by the Nuclear Regulatory Commission.

Operating Instructions for CDV-794/2

Reference. Instruction and Maintenance Manual Radiological Instrument Calibrator, DCPA Item No. CDV-794, Model No. 2.

After the operator has become familiar with the Calibrator Instruction Manual the procedures shown in Section IV, Operation Instruction, will be used to calibrate all portable high range reading RADEF instruments.

Securing the Calibrator

An unattended calibrator will be secured. Upon completion of tests and calibration and during tests requiring radiation exposition time, the operator will secure the calibrator if it is left unattended. Locking holes in the RADIATION-LEVEL SELECTOR wheel allow pad locking of the wheel at a desired radiation level. The calibrator will be secured by following these steps:

- (1) Rotate the RADIATION-LEVEL SELECTOR wheel to the SAFE position. Observe that the SAFE radiation-level indicator glows (green).
- (2) Place the chamber door over the control panel by rolling it to the left.
- (3) Turn off the main power at the switch on the left end of calibrator. Observe that main-power indicator lamp and chamber lamp are OFF.
- (4) Close lower and upper covers and lock.

CDV - 790/1
Low Range Survey Instrument Calibrator
16 millicuries Cesium-137

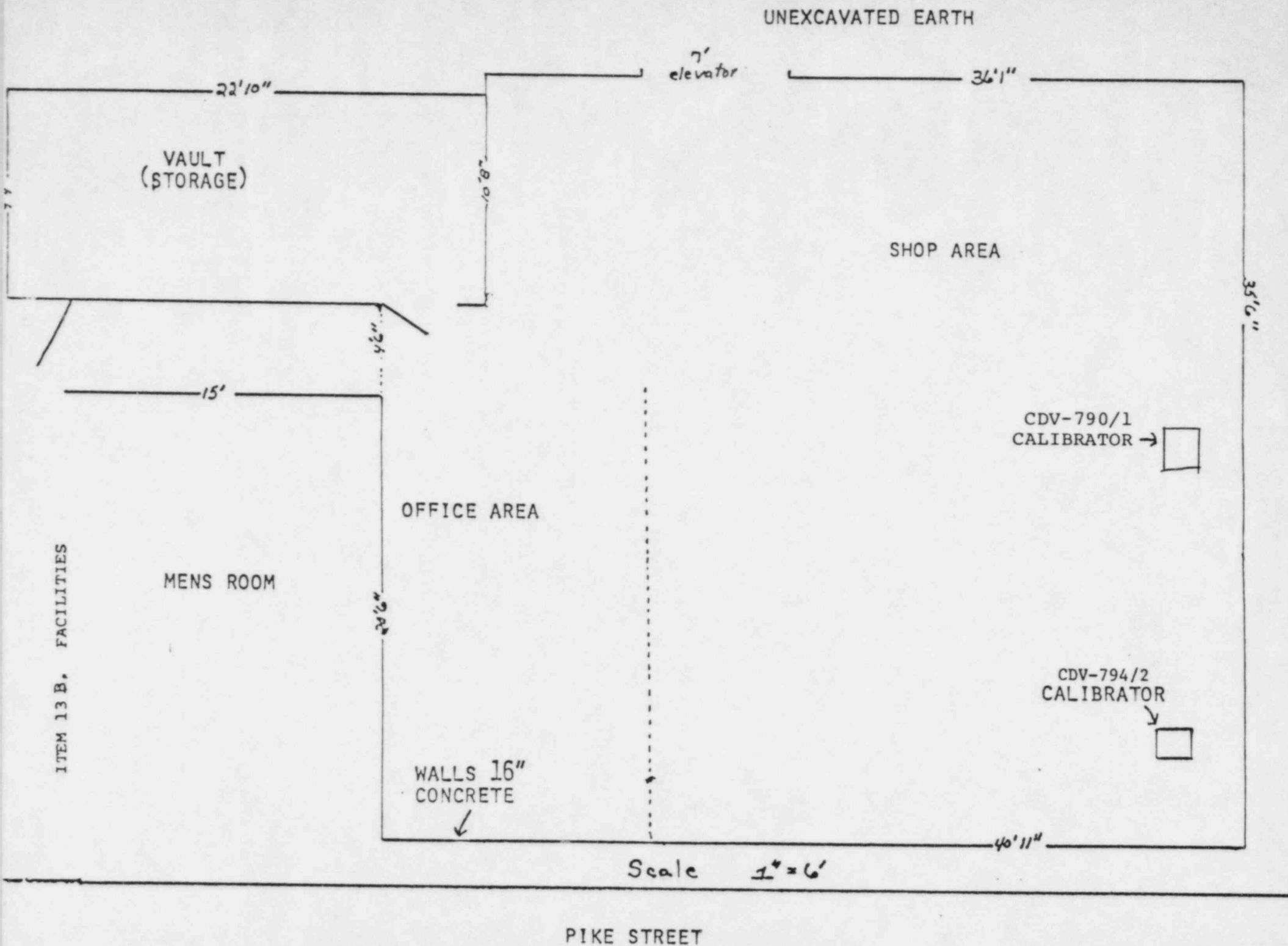
ITEM 13. FACILITIES

The CDV 790/1 Radiological Instrument Calibrator will be located in the Maintenance Shop. The attached sketch will show position of the calibrator with respect to the general work areas.

The equipment and materials will be located in the Radiological Instrument Repair Shop located at:

Indiana Department of Civil Defense
Radiological Instrumentation Maintenance & Calibration
300 East Pike Street
City Building
Crawfordsville, Indiana 47933

The calibration area is located in the south-east portion of the basement of the City Building in Crawfordsville, Indiana, 300 East Pike Street. The building is office space for many of the city departments such as the police department, fire department, Mayor's office, and Crawfordsville Electric Light & Power. Item 13 B shows a diagram of the Radiological Instrumentation Maintenance & Calibration Facility and adjoining areas. As shown in the diagram, (13 B), the calibrator is located in the southeast corner of the Radiological Instrumentation Maintenance & Calibration Facility. This location is chosen so to be away from usual office traffic and from the technicians workbench area. All walls and ceiling of this facility are reinforced concrete sixteen inches thick. Only authorized personnel are allowed past the office area into the maintenance and calibration area.



ITEM 14. RADIATION PROTECTION PROGRAM (Continued)

Records of radiation surveys shall be maintained and shall indicate the type and serial number of the instrument used to perform the survey, the date, person performing the survey, and the radiation intensity.

Records of wipe test shall be maintained and shall indicate the type and serial number of equipment used to perform the analysis, the date, the person(s) performing the test and the test results, and the date the next wipe test should be performed.

ITEM 15. RADIATION PROTECTION PROGRAM

The CDV-790/1 Radiological Instrument Calibrator will be located in the Calibration Area located in the southeast portion of the shop. See Item 13.

The door will be posted with signs bearing the standard three-blade propeller design and the words "DANGER-RADIATION AREA" and "CAUTION-RADIOACTIVE MATERIAL". The inside walls of the Calibration Area will be posted with the same types of signs.

Form NRC-3 shall be posted in a conspicuous place accessible to all personnel. A copy of the by-product material license and 10-CFR, Part 21 shall be posted for the personnel to read.

The area enclosed within the Calibration Area shall be classified as a restricted area, and only authorized personnel will be admitted to this area.

A film badge shall be assigned by serial number and name to each person working in the radiation area on a daily basis. A person or persons who are not permanent facility staff or program members and who may enter the area on an intermittent non-permanent basis will be assigned a visitor's film badge. The film badges will be changed each calendar month and sent to the:

U.S. Army
Ionizing Radiation Dosimetry Center
ATTN: DRSMI-MCI-DCS
Lexington, Kentucky 40511
(606) 293-3646

The CDV-790/1 calibrator will always be housed and operated in the Calibration Area. The CDV-790/1 will always be kept closed and locked when not in operation. The Calibration Area will be locked during non-working hours.

The calibration unit will only be operated by personnel previously trained in its operation and under the supervision of the radiation protection officer or the individual listed in Item 4 of the basic application.

Radiation exposure of personnel will be limited to that specified in Title 10-Atomic Energy, Chapter 1-Nuclear Regulatory Commission, Part 20, Standards for Protection Against Radiation.

In the event of fire or exposure to high temperatures, the area may be contaminated with hazardous levels of radioactive materials, the amount of shielding around the source may be significantly reduced, producing an external radiation hazard. Fires will be extinguished as quickly as possible. The area will be evacuated.

In the event of a fire, personnel over-exposure, release of the radioactive material, or other accidents described in Title 10 of the Code of Federal Regulations, Part 20, Paragraphs 20.402, 20.403, and 20.405, the following will be notified immediately by telephone and telegraph:

ITEM 15. RADIATION PROTECTION PROGRAM (Continued)

- (1) Nuclear Regulatory Commission
Division of Compliance
Region III
Glen Ellyn, Illinois 60137

Phone: (312) 790-5500
- (2) Mr. Mike Pawlowski
Nucleonics Division
Federal Emergency Management Agency
Donohoe Bldg. Room 608
500 C Street, S.W.
Washington, D.C. 20472

Phone: (202) 287-3855
- (3) Radiological Defense Officer
Federal Emergency Management Agency
Region V
Federal Center
Battle Creek, Michigan 49016

Phone: (616) 968-8142 Ext. 6041

In addition to the telephone and telegraph notification listed above the licensee will make a written report within 30 days to the Division of Material Licensing, U. S. Nuclear Regulatory Commission, Washington, D.C., 20545, with a copy to the Director of Region 3, Division of Compliance, under Paragraphs 20.403 and 20.405 of 10 CFR 20.

Records

The Film Badges will be checked every month and recorded in the film badge ledger. A separate sheet shall be maintained in the book for each individual and will contain all of the information called for in Form AEC-5. Also, there will be a space in the ledger for the individual to place his signature verifying his reading. In the event the individual receives no radiation, a zero entry will be made in the ledger. No erasures will be permitted; in case of error, a line will be drawn through the error, initialed and dated by the individual making the correction. Film badge results will be maintained on file.

INDIANA DEPARTMENT OF CIVIL DEFENSE
TRAINING SOURCE SET USERS MANUAL

30 millicuries per set	Cobalt-60
120 millicuries per set	Cesium-137

Item. 15 Part B

INDIANA DEPARTMENT OF CIVIL DEFENSE
RADIATION SOURCE SET USERS MANUAL
AUGUST 1984

Prepared by
Indiana Department of Civil Defense
Room 90B, State Office Building
100 North Senate Avenue
Indianapolis, Indiana 46204
Telephone: (317) 232-3830
Evenings and Weekends: (317) 232-8250
Indiana State Police Operations Desk
to notify
Civil Defense Duty Officer

And
Indiana Department of Civil Defense
Radiological Instrumentation Maintenance & Calibration (RIMC)
300 East Pike Street, City Building
Crawfordsville, Indiana 47933
Telephone: (317) 362-3722

Inspection Jurisdiction of
Nuclear Regulatory Commission
Division of Compliance
Region III
Telephone: (312) 790-5500 (Glen Ellyn, Illinois)
Evenings and Weekends: (312) 790-5500

For Assistance
Federal Emergency Management Agency, Region V
Plans and Preparedness
Radiological Defense Officer
Battle Creek, Michigan 49016
Telephone: (616) 968-8142 Extension 6041

For Accidents Or Emergencies Notify
Gerald W. Glaze, RDO (317) 823-6718
or
Rex J. Bowser, Deputy RDO (317) 232-3830
or
Ronald D. Hudson, RIMC Supervisor (812) 332-1885
Weekdays: (317) 232-3830

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INDIANA CIVIL DEFENSE RADIATION TRAINING SOURCE SET USERS MANUAL

I. Introduction

The Indiana Department of Civil Defense, under contract with the Federal Emergency Management Agency, operates a Radiological Instrumentation Maintenance & Calibration Program. The contract also includes control over Civil Defense Source Sets throughout the State. For this purpose, a license has been obtained, from the Nuclear Regulatory Commission, in the name of the Indiana Department of Civil Defense to control the use of these Source Sets. This manual shall be used by persons using or storing such source sets.

II. General

Training Source Sets are property of the Federal Emergency Management Agency loaned to the State for the purpose of training radiological monitors. The safe use of all radioactive materials is assured under requirements for the Nuclear Regulatory Commission. Failure to comply with regulations can result in the loss of a license to use radioactive materials.

III. Responsibilities

A. Indiana Department of Civil Defense

1. Make application to the Nuclear Regulatory Commission for a license including renewal and any necessary amendments. Provide for the establishment of a radiation safety committee (hereafter "the Committee") to oversee license activities.
2. The Committee shall maintain records for inspection by Nuclear Regulatory Commission representatives to assure that all the applicable regulations and license conditions are complied with.
3. The Committee shall exercise control over disposition and use of sources to assure that license requirements are met.
4. The Committee shall provide information and assistance to source custodians and users on appropriate procedures necessary to meet Nuclear Regulatory

Commission requirements. This will include providing the following forms:

- a. Source storage area survey sheet
- b. Leak test forms
- c. Request form for use of Radiation Source Set for Training
- d. Transfer of sources to authorized users
- e. Application to become authorized user
- f. Log sheet for dispensing source sets by source custodians

B. Radiation Safety Committee

1. The Radiation Safety Committee will be comprised of three representatives from the following: one representative from the Indiana Department of Civil Defense; one representative from the Indiana State Board of Health; and one representative from either Indiana University or Purdue University. Each committee member will be qualified in some aspect of radiological health, health physics, or bionucleonics and recognized as such by the Federal Emergency Management Agency and the Nuclear Regulatory Commission.
2. Members of the Committee shall be appointed by the Director, Indiana Department of Civil Defense, upon recommendation by the Radiation Safety Officer.
3. The Committee shall meet no less frequently than once every six months to transact business. No less than two members must be present to transact business. The Indiana Department of Civil Defense will bear the cost of Committee business, including office expenses, per diem and mileage.
4. Unless otherwise determined, the Committee will meet in the months of September and March to transact business.
5. A chairman of the Committee shall be elected every two years by the members of the Committee. The Radiation Safety Officer shall administer the affairs of the Committee.

6. The Committee will oversee all license activities which encompass but are not limited to the following:
 - a. To establish regulations pertaining to the use of radioactive materials and radiation sources used in the Indiana Department of Civil Defense statewide training program.
 - b. To receive the reports of the Radiation Safety Officer, and to consider additional regulations in accordance with his recommendations.
 - c. To review and act on applications of individuals who wish to become authorized users.
 - d. To define the conditions and the requirements for safe possession of, and work with radioactive materials and to rule on the suitability of existing and proposed facilities.
 - e. To assume the maintenance of adequate records concerning exposure of personnel and the acquisition and disposition of radioactive materials.
 - f. To review reports of non-compliance with these regulations and to take such actions as may be necessary to assume the provisions of these regulations are being met.
7. Responsibilities of the Committee during the interim period between meetings will be borne by the Radiation Safety Officer. The Committee thus serving as a check to oversee that all provisions under the NRC License are being met and carried out.
8. Responsibilities of the Committee include issuing Radiation Source Set users permits to qualified individuals, as determined by the Committee, and to approve storage areas, at the discretion of the Committee, by the authority of the United States Nuclear Regulatory Commission stated in the By-Product Materials License granted to the Indiana Department of Civil Defense.
9. The organization of the Radiation Safety Committee is provided as Appendix A.

C. Radiation Safety Officer

The Radiation Safety Officer shall be a person who has training in the field of health physics. The Radiation Safety Officer will be assisted in his duties by personnel of the Radiological Instrumentation Maintenance & Calibration Shop. The responsibilities of the radiation Safety Officer shall consist of:

1. To be responsible for overall Radiation Source Set placement and security.
2. Maintain records for inspection by Nuclear Regulatory Commission representatives to assure that all the applicable regulations and license conditions are complied with.
3. To maintain records on receipt, disposal and transfer of radioactive materials.
4. Establish source set locations in consonance with Committee recommendations.
5. Provide lists of source locations.
6. Provide information and assistance to source custodians and users on appropriate procedures necessary to meet Nuclear Regulatory Commission and licensing requirements.
7. To provide advice in all aspects of radiation protection.
8. To report interim activities at each meeting of the Radiation Safety Committee.
9. To maintain radiation exposures at the lowest feasible level by the supervision or operation of an effective and appropriate radiation protection program.
10. To indoctrinate personnel in safe working practices and in the nature of injuries resulting from over-exposure to radiation.
11. To assure that personnel monitoring devices are used where indicated and that records are kept of the results of such monitoring.
12. To conduct storage area radiation surveys at the time of placement of the radiation source set in the approved permanent storage areas, and keep records of such surveys including descriptions of corrective measures.

13. To investigate each case of non-compliance with NRC Rules and Regulations.

D. Source Custodian

The Custodian will be responsible for one or two source sets during storage. The following responsibilities are assigned to the Source Custodian. The Source Custodian must be an authorized user or must maintain an authorized user as a Safety Officer.

1. The Source Custodian will be responsible for source set security and safety.
2. The following instruments will be the minimum requirement that each Source Custodian shall possess or have access to while using the CDV-782, 784, and 786 Source Sets:
 - CDV-138 DOSIMETERS - a minimum of two (2) for personal exposure
 - CDV-700 SURVEY METER - a minimum of one (1) for area survey
3. Provide a controlled location for permanent storage of the source when it is not in use for training purposes.
4. Notify the Indiana Department of Civil Defense Radiation Safety Officer if the permanent storage location is desired to be changed. Either the source can be returned to the Radiological Instrumentation Maintenance & Calibration Facility or arrangements made to provide a new storage area. This new area must receive the approval of the Radiation Safety Committee.
5. Perform wipe tests during January, May and September. Wipe test results and log sheets will be sent to the Radiological Instrumentation Maintenance & Calibration Facility. Approximate four-month intervals have been selected to assure that the required six-month maximum interval is not exceeded.
6. Assure that no sources with improper tagging are released for utilization.
7. Notify the Radiation Safety Officer or Radiological Instrumentation Maintenance & Calibration Facility of any improperly tagged sources.

8. Report, immediately, to the Indiana Department of Civil Defense and the Radiation Safety Officer or Radiological Instrumentation Maintenance & Calibration Shop losses of sources or damage.
9. Issue sources to authorized users for the purpose of conducting monitor training courses. Authorized users will possess a Users Permit card, a letter of request, and will also be placed on a Statewide Users List. (See Appendix G for the initial authorized user list. This list will be revised as names are added or deleted.) Sources may only be dispensed to, and in the physical presence of, persons on the authorized user list and possessing a valid Users Permit card. Sources must all be checked for the presence of radioactivity (this assures that the capsule is intact) and counted in front of the recipient both at the time of loan and the time of receipt to the permanent storage location. Signed receipts (See Appendix D) will indicate acknowledgement of such a count.
10. Source Custodian will be responsible for seeing that persons possessing User Permits have a valid permit. (In other words, Custodian must check to see permit has not expired.)
11. Maintain a log showing disposition of the source set. A copy will be forwarded to the Radiation Safety Officer at the time leak test records are forwarded.
12. Make notification to the Radiation Safety Officer of any change in address, phone, or other information on license application.

E. Authorized Users

Authorized Users, unless they are also Source Custodians, will not have a location for permanent storage of a source set. Responsibilities are as follows:

1. The following instruments will be the minimum requirement that each Authorized User shall possess or have access to while using the Source Sets:

CDV-138 DOSIMETER - a minimum of two (2) for personal exposure measurement.

CDV-700 SURVEY METER - a minimum of one (1) for area survey

2. A written request for use of the training source set should be made to the source custodian. Requests and source pick-up arrangements should be made well in advance. This will allow for alternate arrangements in the event of simultaneously scheduled usage. Source set locations and custodians are listed in Appendix F of this manual.
3. Provide temporary storage area during the conduct of a class. This storage area must meet the requirement that the source is secured against the possibility of unauthorized removal.
4. Provide control over the radioactive sources from the time of receipt to the time of return to the source custodian.
5. Assure, personally, that sources are handled correctly.
6. Report immediately any loss or suspected damage of sources to:

	<u>DAYS</u>	<u>WEEKENDS, EVENINGS</u>
a. Indiana Department of Civil Defense-Radiological Instrumentation Maintenance & Calibration Program	(317) 362-3722	(812) 332-1885
b. Indiana Department of Civil Defense	(317) 232-3830	(317) 823-6718
c. Nuclear Regulatory Commission-Region III	(312) 790-5500	(312) 790-5500
d. Federal Emergency Manage- ment Agency Region V, Radiological Def. Officer	(616) 968-8142 Extension 6041	(616) 968-8142 Extension 6041
e. State Board of Health	(317) 633-0152	(317) 633-0144

7. Make notification to the Radiation Safety Officer or Radiological Instrumentation Maintenance & Calibration Shop of any change in address, phone, or other information on license application.

IV. Application for Authorized User

In general, a person desiring to be an authorized user, should have a scientific or technical background that would enable him to understand the basic principles of radiation to the extent that he may be in a position to impart the necessary technical information to others. The minimum requirement for approval by the Radiation Safety Committee will be:

- A. The person has satisfactorily completed a FEMA Radiological Monitoring for Instructors Course or Radiological Defense Officers Course given by an authorized organization and instructor.
- B. The person has a general background which would permit him to comprehend the subject matter presented in such a course and possesses the capability and desire to teach others in radiation detection equipment use.
- C. The person has read and understands this manual and the appendices.
- D. Application will be made on a form provided by the Indiana Department of Civil Defense-Radiological Instrumentation Maintenance & Calibration Facility.
- E. In cases of question, the Indiana Department of Civil Defense Radiation Safety Committee reserves the right to provide a written examination for the applicant. On acceptance, the Indiana Department of Civil Defense Radiological Instrumentation Maintenance & Calibration Program will add the authorized users name to a list provided to source custodians.
- F. New permits will be issued to individuals during the month following application approval by the Committee. Renewal permits will be issued at the time of license renewal. Renewal permits do not require re-application.

V. Handling and Use of Sources

A. Exposure Control

1. Student exposures shall be controlled by the following techniques:

- a. The instructor shall be present at all times when the source set is used.
- b. The source set shall not be left unattended when open.
- c. The students shall be advised anytime they enter an area where the source set is being used.
- d. Radiation warning signs shall be posted in the area where the source set is being used and access to the area shall be controlled by the instructor.
- h. Radiological Monitor Training for persons under 18 years of age.

It has been determined that the radiation exposure to all individuals taking RADEF courses can be limited to less than 10 milliroentgens per whole body per week. Section 20.104 Exposure of Minors of the U.S. Nuclear Regulatory Commission, Code of Regulations, Title 10, Part 20 Standards for Protection Against Radiation restricts exposure to any individual under 18 years of age to 125 milliroentgens per calendar quarter. This limit would be approximately 10 milliroentgens per week.

For the above reasons, extra diligence and control is required while training persons under 18. It is recommended that a CDV-138 dosimeter be assigned to each minor and a record should be made of any measurable exposure to minors.

The instructor should insure that students under 18 years of age receive only the minimum exposure necessary to provide for (a) familiarization with the operation of the civil defense instruments when exposed to radiation and (b) demonstration of effectiveness of shielding against gamma radiation.

It is not intended that persons under 18 be assigned as operational radiological monitors. However, participation in these courses by selected groups (e.g. high school science

students and organized Civil Air Patrol Cadets) will assist in their understanding of radiation detection, measurement and penetration. This also promotes good citizenship and will better prepare them to assume a leading role in disaster preparedness when they pass to adulthood.

B. Handling

1. Remote handling tongs, 18 inches long, will be used whenever the sealed capsules are handled. Sources will not, under any circumstances, be removed from sealed capsules.
2. Source sets transferred will be handled and transported by an authorized user. When not in use and during transport, sources will be enclosed in padlocked, standard lead containers.
3. The source shall be transferred when required, in an automobile operated by the authorized user under the following conditions:
 - a. The source set shall be padlocked.
 - b. The vehicle shall be monitored to determine the radiation levels within it.
 - c. All occupants of the vehicle should wear two (2) CDV-138 (0-200mR) dosimeters and any exposure recorded.
 - d. The vehicle shall be locked at all times when parked and source set is left inside.
4. Sources, when out of the locked containers shall be used only in the physical presence of an Authorized User. The Authorized User must control all areas with an exposure rate of greater than 2 mR per hour. After use, the capsules will be returned promptly to the containers and a survey made to establish that all capsules are active and present. Capsules will be counted when returned to the container and will be locked in the containers before classes are dismissed. If the final survey indicates that the source remains outside of the container or if any capsule is unaccounted for, the Authorized User will immediately notify the Radiological Instrumentation

Maintenance & Calibration Facility, Indiana Department of Civil Defense by telephone. The remainder of the source set will be secured pending further instructions. Immediate notice will be given to Region III, Division of Compliance, Nuclear Regulatory Commission. Telephone numbers are listed at page 7.

5. Dosimeters (CDV-138) should be worn by instructors and dosages should be recorded. Exposure to radiation will be kept to a least practical minimum at all times.
6. In the event that the Civil Defense training source sets must be shipped by any means other than the custodian or authorized user to an alternate location, procedures will be followed as outlined in Appendix E, "Procedures For Shipping and Receiving the FEMA CDV-784/786 Radiation Source Set", and contact the Indiana Department of Civil Defense Radiation Safety Officer for instructions. Under no circumstances shall any FEMA source set granted to the Indiana Department of Civil Defense be transported out of Indiana.

C. Leak Tests

Leak tests will be conducted according to the following procedures on a routine basis. Failure to receive a reminder does not relieve the Source Custodian from the leak testing requirement.

Note: A CDV-138 dosimeter must be worn during the leak test and any exposure recorded in the "log sheet".

1. The source set should be placed on a support capable of supporting 280 lbs. The source set should be placed in such a manner as to not allow line-of-sight with the bottom of the containers where the capsules will accumulate.

Note: The CDV-700 must be checked against the beta check source on the side of the instrument prior to leak testing. This must be done in an area of normal background radiation, approximately 15-20 counts per minute. Ascertain proper adjustment of the CDV-700 as per instructions in the CDV-700 maintenance manual.

2. Place in readily available locations near the source set an opened container of isopropyl alcohol (leave it open during the leak test), several 6" swabs, two pair of 18" tongs or one pair of tongs and one pair of long-nosed pliers, and a disposable surface such as plastic wrap. (Filter paper or paper towel of high wet-strength may be used in lieu of the swabs.) Place an operational (turned on) CDV-700 about 6 to 8 feet away from the source set.
3. Open the large container and place the lid next to it upside down. Set the small container in an accessible position and put the small container lid on the large container lid topside up.
4. Wet a swab, or test paper (wipe) held with tongs with the alcohol (do not use water) and thoroughly wipe each capsule. Place each capsule inside the large container after each capsule has been passed near the CDV-700 to determine the activity of the capsule. If the wipe should dry out during this process, place it on the disposable surface and wet an additional wipe. During the wiping, quickly visually inspect each capsule for breaks, cracks, ruptures, or missing end screws. If any of these discrepancies are found, replace all capsules and the wipes used in the source set and lock it, then notify the State Radiation Safety Officer for instructions. ALL ACTIONS WITH THE CAPSULES MUST BE DONE AT AN ARM'S LENGTH. Wipe the inside of the small container with the test wipe. Place the wipe on the disposable surface. Secure and lock the source set.
5. Using the tongs to hold the test wipe(s), take the CDV-700 and the test wipe(s) to the same area where background was determined. Hold the wipe(s) close to but not touching the probe window of the CDV-700. A constant reading about 0.05 mR/hr on a properly adjusted CDV-700 will be due to contamination on the wipe(s). Do the same with the disposable surface.
6. If no contamination is detected, lock up the source set. If contamination is detected, lock the test wipe(s) and disposable surface inside the small container, check the tools, area and yourself for possible contamination, then notify the State Radiation Safety Officer for disposition of the leaking source set.

Note: It may be advantageous to rely more on the headphones of the CDV-700 than the meter face, since the headphones yield a more perceptable response. Be certain not to confuse normal surges in background with radiation from possible contamination. Holding the wipe test paper perfectly still may alleviate any confusion.

7. Record the test results and your exposure on the proper forms and forward a copy of the test results to the State Radiation Safety Officer, at the RIMC Facility, Crawfordsville, Indiana.

D. Missing or Illegible Warning Tags

Any capsule without proper tagging must not be used. If a capsule without proper tagging is discovered, notify the Indiana Department of Civil Defense-Radiological Instrumentation Maintenance & Calibration Facility so that the Radiation Safety Officer may replace the tag. If all the remaining capsules have proper tags, they may be used. Secure the improperly tagged capsule in the large container and lock it while using the remaining capsules.

E. Empty Capsules

In the event an empty capsule is discovered the following procedures will be followed:

1. All capsules should be secured in the lead container and removed from the general area where they were being handled. The general area should then be surveyed very carefully with a CDV-700 until the source is located. The area should also be secured from personnel entry except for personnel to be used to locate the source.
2. If the radiation source is visible to the naked eye, as it should be on a hard, smooth surface such as concrete, the source should be picked up using a broom and a long-handled dust pan, the CDV-788 source handling tongs, long-handled forceps or any other method which will enable the individual to keep the radioactive source away from his person. The empty capsule and other capsules should be secured in the lead containers and marked as unusable.

3. If the general area has earth, sand or gravel surface, the monitoring of the area must be very thorough because the radiation may have been trampled beneath the surface, making it more difficult to locate. If the source can be located within a small area (less than one square foot), a spade or shovel should be used to remove the surface layer of this small area. Each shovelful of earth, etc., and the area from which it was removed should be thoroughly monitored until it is determined that a particular shovelful contains the source. This shovelful of earth, etc., containing the source should be carefully placed in the large lead container after removing the small lead container containing the other source capsules. The earth, etc., inside the large container should then be monitored to ensure that the source is still mixed with this material. Then, both lead containers should be thoroughly secured and marked as unusable. The dose rates and the date should be clearly marked on the outside surfaces. No attempt should be made to separate the source from the earth, sand, or gravel in which it is located.
4. Upon completion of locating the source and placing it in a lead container, the lead container should be wipe tested and all personnel and equipment involved in picking up the source should be thoroughly monitored to ensure that no radioactive contamination is present. If no contamination is detected, the source set should be completely removed from the area and the entire area in use where the incident occurred should be remonitored to ensure that the levels of gamma radiation do not exceed normal background. If the area appears to be free of radioactivity above the background levels, the area can be returned to normal use, if absolutely necessary. However, if possible, the source set user should obtain the assistance of someone qualified in the field of radiation health physics to check the area prior to allowing it to be returned to normal use.
5. Immediately after an incident of this type occurs, the source set user should contact the Radiological Instrumentation Maintenance & Calibration Facility, Indiana Department of Civil Defense and the Radiation Safety Committee. The source set should be placed in storage and should be considered the

same as a leaking source set. This set should not be removed from its lead container nor used for any purpose by the authorized user.

6. In the event the source cannot be located or contamination and/or radioactivity appears to be present, access to the area shall be completely restricted by any means available, such as locked and posted doors, roping or barricading the area with prominently displayed signs which clearly indicate the nature of the hazard. Then call the Radiation Safety Officer who will thoroughly investigate the incident and prescribe remedial actions.
7. Instructions for disposal and/or the replacement of source sets must be obtained from the Indiana Department of Civil Defense-Radiological Instrumentation Maintenance & Calibration Facility.

VI. Applicable Portions of NRC Regulations

Copies of the Regulations and Nuclear Regulatory Commission License will be found as appendices to the Source Set Users Manual. The following are applicable to Civil Defense Source Sets:

1. Records of receipt and transfer of radioactive materials are required. (See 30.51).
2. Exposures of individuals in restricted areas must be controlled (See Section 20.101). Personnel, 18 years of age or older, not likely to receive one-fourth of the applicable limits are not required for each individual. One-fourth of the limits would be approximately 300 mR per calendar quarter for the whole body and 4600 mR per calendar quarter for the hands. With normal handling techniques (18-inch tongs) and training exercises, exposures will be a small fraction of the above values.
3. Permissible levels of radiation in unrestricted areas (See Section 20.105). The regulations require restricting levels to 100 mR in any seven consecutive days (0.5 mR per hour for continuous storage) or 2 mR per hour in any one hour. Thus, temporary storage (such as the trunk of a car) would be permitted with a dose rate of 2 mR per hour outside the storage area for storage durations

of up to 50 hours in one week. For permanent storage in a locked room, the source set should be positioned so that all areas outside the room have a dose rate less than 0.6 mR per hour.

4. Surveys required. (See Sections 20.201 and 20.401). The definition of a survey in the regulations includes an evaluation such as the location of materials and measurements of radiation levels. Appropriate for Civil Defense source sets would be a physical count of the number of sources, determination that they are all active, surveys of radiation levels and surveys in unrestricted areas. Records of these surveys are performed by the Radiation Safety Officer at the time of placement of the source in the approved storage area.
5. Labeling required. Section 20.204 (c) exempts an area from posting requirements providing the area is controlled and attended for a period of less than eight hours at that location. It is required that, at any time the sources are out of the containers, they be attended by one of the authorized users. Thus, for training classes, the area is not required to be posted; however, signs are provided, and, in many instances, it is desirable to post entrances to areas to warn unsuspecting persons entering the area. This does not relieve the user of being present and observing a person entering the area in which the sources are being used.

Section 20.204 (a) exempts posting a room or area in which radioactive material in the form of sealed sources is stored providing the radiation level 12 inches from the source container is less than 5 mR per hour. The Civil Defense source sets are provided with two shielding containers which will limit the dose rate to less than 5 mR per hour at 12 inches. Although this exemption applies, in many instances it is advisable to post the storage room so that emergency personnel such as fire-fighters might be aware of the presence of radioactive material should entrance be necessary.

Labels are required for each container housing the Civil Defense sources. These labels must contain the standard three-bladed radiation symbol with the words "Caution, Radioactive Material" or "Danger, Radioactive Material". The label is

required to provide sufficient information (such as radiation levels, kinds of material, estimate of activity, date for which activity is estimated, etc.) to permit individuals handling or using the containers to take precautions to avoid or minimize exposures (See Section 20.203 f). For Civil Defense source sets the additional information required will include identifying the isotope as radiation, radioactivity in millicuries, date for which the quantity of radioactivity is appropriate.

6. Instruction of personnel. Section 19.12 requires that any person in a restricted area be informed of the occurrence of radioactive material and necessary precautions. Students should be advised of the methods for minimizing exposures.

Section 19.11 (b) requires that each licensee maintain a copy of the regulations available for examination. A copy of the NRC Regulations Part 19, 20, and 30 are stored on location with each source set. (See appendix B).

Any changes in the regulations, which will affect the use of Civil Defense source sets, will be forwarded to custodians and licensed users.

Section 19.11 (c) requires that form NRC-3 be posted so that it may be observed by appropriate personnel. It is required that this form be posted at all permanent storage locations for Civil Defense Source Sets where it may be observed by the custodian plus the authorized users who will be borrowing the sets. The custodian may request additional copies of the form from the Indiana Department of Civil Defense-Radiological Instrumentation Maintenance & Calibration Facility.

7. Storage of source sets. Section 20.207 requires that radioactive materials be stored in such manner as to be secured against unauthorized removal from the place of storage.
8. Reports of theft or loss. Section 20.402 as amended and effective as of July 11, 1975* requires the licensee to submit a written report in addition to

*The copies of the USNRC Rules and Regulations, stored with each source are the most recent available at the time of the printing of this manual, and therefore account for any and all amendments referred to herein.

the telephone report previously required by Section 20.402 (Amendment of Section 20.402)

The written report must be filed within 30 days from the date that the licensee learns of the loss or theft and must include the following information: description of the licensed material including kind, quantity, chemical and physical form; conditions under which loss or theft occurred; disposition or probable disposition of the radioactive material; known radiation exposures and circumstances under which they occurred; extent of possible hazards to persons in unrestricted areas; and steps which have been taken or will be taken to recover the material and to prevent a recurrence of the loss or theft.

The amendment* provides also that any report filed with the Commission pursuant to Section 20.402 shall be so prepared that names of individuals who have received exposure to radiation are stated in a separate part of the report.

Subsequent to filing the written report the licensee is required to report any substantive additional information which becomes available on the loss or theft within 30 days after he learns of such information.

9. Procedures for opening packages. Section 20.205 requires each licensee to establish and maintain procedures for safely opening packages in which licensed material is received, and shall assure that such procedures are followed and due consideration is given to special instructions for the type of package being opened.
10. Reports of incidents. Section 20.403 classifies several types of incidents that are reportable (some immediate) to the Nuclear Regulatory Commission.

*The copies of the USNRC Rules and Regulations, stored with each source are the most recent available at the time of the printing of this manual, and therefore account for any and all amendments referred to herein.

VII. License Conditions

In addition to NRC Regulations, certain conditions are placed, and made a part of, each radioactive materials license. The license is **reproduced** and included as Appendix C to the Source Custodians Manual. The authorized users and custodians should become familiar with these conditions.

APPENDIX A

RADIATION SAFETY COMMITTEE

RADIATION SAFETY COMMITTEE

Gerald W. Glaze
Radiation Safety Officer
Indiana Department of Civil Defense
Radiological Instrumentation Maintenance & Calibration Facility
300 East Pike Street
Crawfordsville, Indiana 47933
Business Telephone: 317-232-6878
Residence Telephone: 317-823-6718

Henry C. Briggs (Chairman)
Student Health Center
Indiana University
Bloomington, Indiana 47401
Business Telephone: 812-335-3230
Residence Telephone: 812-332-5337

Hal S. Stocks
Industrial Hygiene and Radiological Health Division
Indiana State Board of Health
1330 West Michigan
Indianapolis, Indiana 46206
Business Telephone: 317-633-0152
Residence Telephone: 317-253-6189
24-Hour State Board of Health Telephone: 317-633-0144

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APPENDIX B

NRC RULES AND REGULATIONS

Stored on location with each source.

APPENDIX C

LICENSE

(Will be included when received.)

APPENDIX D

CIVIL DEFENSE SOURCE SET FORMS

SAMPLE

RADIATION SOURCE SET REQUEST

Date _____

TO: Custodian
County Civil Defense Director (possessing radiation source)
R.I.M.C. Shop

From: County Civil Defense Director (requesting source to conduct
a class) or Authorized User

Dear Sir:

I request the use of your radiation source set to conduct a
Radiological Monitoring class in my jurisdiction on _____
_____.

I would like to have your source picked up on _____
by my authorized user _____ who will
present a copy of this letter and his authorized User Card to you at
that time. We will return the source back to you on _____
_____.

Thank you for your consideration. If you have any questions,
please call me at _____.

Sincerely,

County Civil Defense Director
or
Authorized User

To be kept by Source Custodian

Source Set Serial No.

Number of Sources

Custodian

[illegible]

RECEIPT FOR CIVIL DEFENSE SOURCE SET

INDIANA DEPARTMENT OF CIVIL DEFENSE
RIMC PROGRAM

On _____, I received a Civil Defense Radiation Source Set, Serial Number _____. The sources were tested for radioactivity at the time of transfer. _____ sources, all active, were received. I am an authorized user under the Indiana Department of Civil Defense License to use the set and it will be used for training Radiological Monitors (or I am an authorized user under NRC License Number _____ to use the source set in the State of Indiana). Date of return of source set will be _____. My radiation User Permit is Number _____.

Received by:

Signed _____

Date _____

Print Name _____

Address _____

Telephone No. _____

Loaned by: _____ (Source Custodian)

Return of source set: Date _____

I certify that, on this date, the above source set was returned and all sources were received (all active).

(If not, do not sign receipt and notify Radiological Instrumentation Maintenance & Calibration Facility, Indiana Department of Civil Defense and the Radiation Protection Committee.)

Returned By: Signed: _____ (Source Custodian)

Signed: _____

Training Performed

Number of classes held: _____

Number of Monitors trained: _____

Total dose of source set users (CDV-138 dosimeter) _____ mr

Maximum dose of class members wearing CDV-138 dosimeters _____

(Use three forms, original for source custodian, one for source user, and one for forwarding to the Indiana Department of Civil Defense RIMC Program.)

APPLICATION TO BECOME AUTHORIZED USER
OF CIVIL DEFENSE RADIATION SOURCE SET
UNDER THE NUCLEAR REGULATORY COMMISSION LICENSE
ISSUED TO THE INDIANA DEPARTMENT OF CIVIL DEFENSE

1. Name, Address and Telephone Number of Applicant

2. Training and Experience of Applicant

a. FEMA Radiological Monitor Instructors Course:

Date _____

Location _____

Instructors _____

b. Experience with Radiation:

Duration of experience _____

Location _____

c. Technical background (use reverse side if necessary):

College level courses (or degree) _____

Experience _____

d. Occupation _____

3. Social Security Number _____

4. Birth Date _____

5. Age _____

6. Other Pertinent Remarks: _____

If application is for renewal of license, indicate previous radiation permit and Card Number _____.

I have read and understand the "Indiana Civil Defense Radiation Source Set Users Manual".

DATE: _____ SIGNED: _____

SUBMIT ONE COPY TO: Indiana Department of Civil Defense
Radiological Instrumentation Maintenance
& Calibration Facility
300 East Pike Street, City Building
Crawfordsville, Indiana 47933

LICENSEE IS RESPONSIBLE FOR NOTIFICATION TO THE RADIATION PROTECTION
OFFICER FOR ANY CHANGE IN ADDRESS, PHONE, OR OTHER INFORMATION
SUBSEQUENT TO THIS APPLICATION.

CHANGE OF ADDRESS OR TELEPHONE?
(Fill in Blanks)

Yes No

Name _____ Telephone _____
Street or Rural Route _____ County _____
City _____ State _____ Zip _____

CHANGE OF ADDRESS OR TELEPHONE?
(Fill in Blanks)

Yes No

Name _____ Telephone _____
Street or Rural Route _____ County _____
City _____ State _____ Zip _____

CHANGE OF ADDRESS OR TELEPHONE?
(Fill in Blanks)

Yes No

Name _____ Telephone _____
Street or Rural Route _____ County _____
City _____ State _____ Zip _____

STORAGE AREA SURVEY
CIVIL DEFENSE RADIATION SOURCE SET

County _____	Source Set Identification: _____
Address _____	_____
_____	Serial No. on side of storage container: _____
_____	_____
Date _____	Key No.: _____
Survey By _____	_____
Calibrated CDV-700 Used? _____	No. of Sources _____
Yes _____ No _____	_____

How are inner and outer containers labeled? _____

What is above storage room? _____

Below? _____

Maximum reading 12" from outer surface of storage container _____

_____ mR/hr.

Indicate maximum readings at each outside wall, above and below room (on sketch). Indicate locks and labels on door. Where is form NRC-3 posted (Notice to Employees)?

SKETCH:

LEAK TEST RECORD

CIVIL DEFENSE RADIATION SOURCE SET

(For the month of _____)

Dear Custodian:

Please perform the necessary wipe test for the Civil Defense Radiation Source Set assigned to you, complete this form and forward it to the Indiana Department of Civil Defense- RIMC Program:
ATTN: WIPE TEST RESULTS, City Building, Pike Street, Crawfordsville, Indiana 47933

County _____ Source Set Serial No. _____
Source Set Storage Address: _____ Key No. _____
_____ Number of sources counted? _____
_____ All active (this date)? _____
_____ All Tagged? _____

Leak tests should be performed in accordance with procedures outlined in the "Indiana Civil Defense Radiation Source Set Users Manual" (Section V.C.) dated July, 1984.

RESULTS OF TESTS:

ALL WIPES NEGATIVE*

☐

ONE OR MORE WIPES CONTAMINATED

☐

If contaminated, record findings below and call immediately the Radiological Instrumentation Maintenance & Calibration Facility, Indiana Department of Civil Defense, City Building, Pike Street, Crawfordsville, Indiana 47933 (317) 362-3722. If no reply, or on weekends, evenings, or holidays, call Mr. Gerry Glaze (317) 823-6718 for emergency assistance. If no reply, call Mr. Ron Hudson (812) 332-1885. If yet no reply, notify the Radiation Safety Committee (See page i for emergency numbers in Radiation Source Set Users Manual.)

DATE _____ SIGNED _____
(Source Custodian)

*Check in an area where the CDV-700 geiger counter is fluctuating normally (3.g. 0 to 0.05 mR/hr. which is equivalent to less than 0.05 microcuries of radiation). If no difference is noted, test each wipe with the probe shield open.

APPENDIX E

PROCEDURES FOR SHIPPING AND RECEIVING THE
FEMA CDV-784/786 RADIATION SOURCE SET

PROCEDURES FOR SHIPPING AND RECEIVING THE
FEMA CDV-784 or 786 RADIATION SOURCE SET

During the loading, transport and unloading of the CDV-784 or 786 radiation source set, a CDV-700 survey meter shall be turned on, in the area of loading and unloading, and in the driver/passenger area of the transport vehicle. (At no time shall the CDV-791--small container--be transported on the road outside of the CDV-792--large container.) No less than two (2) CDV-138, 0-200 mR Dosimeters shall be on the person(s) involved in the loading, transport and unloading of the source set, preferably on the person(s) who will have the longest intimate contact with the source set.

Upon receipt of the source set, the receiver shall perform the following tests on the source set:

Open the source set and remove the CDV-791 and set it aside the CDV-792. Using 18" tongs, quickly remove all capsules from the CDV-791 and place them inside the CDV-792. Again, using the 18" tongs, remove each capsule individually, and pass it near the probe of an operational CDV-700, then replace it in the CDV-791. This is to assure the activity of the radiation source set as well as assure the integrity of encapsulation. While doing this, quickly visually inspect each capsule at an arm-plus-tongs length to assure that the capsule is properly tagged. Each capsule should produce approximately the same audio response in the CDV-700. Do not take the time to measure the gamma exposure rate.

After completion of the training exercise, and when returning the capsules to the containers, these tests should be repeated.

These tests should be performed on a surface capable of supporting the 250 pound source set and high enough to not permit line-of-sight to the bottom of either container where the capsules gather. Also, the tests shall be performed by a licensed radiation source set user possessing a valid radiation source set users permit.

If any capsule(s) appear(s) dead (inactive), replace all capsules in the CDV-791 and return it to the CDV-792 and lock it, restrict the area and transport vehicle and notify the Indiana Department of Civil Defense-Radiological Instrumentation Maintenance & Calibration Facility and ask for radiological assistance, in the attention of the Radiation Safety Officer.

After the tests are completed, record the personal/personnel accumulated exposure, if any, and other required information on the appropriate form(s) in Appendix F of this manual.

APPENDIX F

LIST OF SOURCE SET STORAGE LOCATIONS AND CUSTODIANS

To be updated, published and distributed annually.

APPENDIX G

AUTHORIZED USERS PERMIT LIST

To be updated, published and distributed annually.