

License Renewal 21-01222-05

Continued NRC Form 313 "Application for Material License"

1. **Radioactive Material.**

- a. Element and Mass Number: Cs-137 and Am 241-Be.
- b. Chemical and/or Physical Form: Sealed Sources. The sources are found in the MC-1 Soil Density Tester. The manufacturer of the tester is Campbell Pacific Nuclear. The model number of the tester is the MC series.
- c. Maximum amount which will be possessed at anyone time: 137 testers.  
Maximum amount of millicuries per source, per tester is:

10 mci Cs-137 and  
50 mci Am241-Be

Total amount of millicuries per tester is 60 mci. Total amount of millicuries per this license is 8220 millicuries.

2. **Purpose for which licensed material will be used.**

The MC-1 Tester (a commercial construction equipment) is used by the Department of the Army throughout the United States and overseas for depth density and moisture measurement of soil and asphalt. The testers are returned to the manufacturer for repair or to other licensed repair organizations.

3. **Individual Responsible for Radiation Safety Program and their Training and Experience.**

TACOM, Karen Lapajenko McGuire, Radiation Safety Officer (RSO), See Supplement A.

4. **Training for Individuals Working in or Frequenting Restricted Areas.**

(See Supplement B)

5. **Facilities and Equipment.**

(See Supplement C)

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6. **Radiation Safety Program.**

(See Supplement D)

7. **Waste Management.**

(See Supplement E)

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NRC License Renewal Package Supplement Listing

Supplement A – Resume of Personnel Responsible for the Radiation Safety Program.

Supplement B – Training for Individuals Working In or Frequenting Restricted Areas.

Supplement C - Facilities and Equipment.

Supplement D – Radiation Safety Program.

Supplement E – Waste Management.

Supplement F – Accountability and Physical Inventory of Testers.

Supplement G – Environmental Impact Statement.

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Supplement A

Resumes of Personnel Responsible for the Radiation Safety Program

## RESUME

### KAREN LAPAJENKO McGUIRE

Current Position: Health Physicist  
U.S. Army Tank-automotive and Armaments Command  
Warren, MI

### EDUCATION:

- 1981 - AA Liberal Arts, Macomb County Community College, Warren, MI
- 1983 - BS Industrial Health and Safety, Oakland University, Rochester, MI
- 1984 - Occupational Health and Safety Specialist Intern Training Program, U.S. Army Material Command Field Safety Activity, Charlestown, IN
- 1999 - MS General Administration, Central Michigan University, Mt. Pleasant, MI

### TRAINING:

	<u>Duration Of Training</u>	<u>On-the Job</u>	<u>Formal Course</u>
Radiological Safety and Laser Safety, AMC Field Safety Activity, IN, August 1984	6 Days	No	Yes
Transportation of Radioactive Materials, Afftrex, LTD, Ft. Belvoir, VA, January 1985	1 week	No	Yes
Applied Health Physics, Oak Ridge Associated Universities, Oak Ridge, TN, April – May 1985	5 weeks	No	Yes
Radiological Safety of Depleted Uranium, U.S. Army Materials Technology Laboratory, MA, July 1985	1 week	Yes	No

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	<u>Duration Of Training</u>	<u>On-the Job</u>	<u>Formal Course</u>
Environmental Assessment Preparation, Ft. Lee, VA, August 1985	1 week	No	Yes
Instructor's Training Course for Operators of the Tester, Density and Moisture, Nuclear Method, NSN 6635-01-030-6896, TACOM, December 1985	1 day	No	Yes
Radioactive Waste Packaging, Transportation, and Disposal Chem-Nuclear Systems, Inc., Columbia, SC, November 1986	1 week	No	Yes
Radiation Protection Internal Review Course Fort Belvoir, VA August 1988	1 week	No	Yes

WORK EXPERIENCE

Jan 1982 to Dec 1983: Safety Internship sponsored by Oakland University at an Industrial Health Clinic, with General Motors Safety, with Awrey Bakery Co., and with Clayton Environmental Consultants (An Industrial Hygiene Firm).

Apr 1984 to Oct 1984: Safety Specialist Intern, U.S. Materiel Command Field Safety Activity, Charlestown, IN. Received formal training in all aspects of safety and occupational health in order to function as a safety specialist for the Department of the Army.

Oct 1984 to May 1985: Safety Specialist Intern, U.S. Army Tank-automotive and Armaments Command (TACOM), Warren, MI. Performed safety and health surveys/inspections throughout TACOM, U.S. Army Detroit Arsenal Tank Plant and Selfridge Air National Guard Base which are heavy industrial and research and development facilities with hazardous processes and materials. Assistant instructor of vehicle safety operations for Department of Army (DA) licensed operators.

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May 1985 to Oct 1988: Occupational Health and Safety Specialist, Alternate Radiation Protection Officer (ARPO), Radiation Control Officer (RCO), and Laser Safety Officer (LSO), TACOM, Warren, MI.

Conducted safety inspections throughout TACOM, DATP and Selfridge ANG Base which are heavy industrial and research and development facilities with high hazard processes and materials, to eliminate safety and health hazards and enforced corrective actions in this area. Coordinator and Evaluator for suggestions submitted to the Command safety suggestion program. Performed health physics functions at TACOM, DATP and LATP. Health Physics functions involve life cycle controls of TACOM commodities utilizing radioactive material and ionizing radiation producing devices and the evaluation of radiological protections programs and radiation facilities.

Oct 1988 to Present: Health Physicist, Major Subordinate Command (MSC) Radiation Safety Officer (RSO), and Laser Safety Officer (LSO), TACOM, Warren, MI. Responsible for the management of the TACOM-Warren Radiation Safety Program. Implement Federal, State and Army Directives and develop policy and guidance for and monitor all operations within TACOM involving procuring, receipting, using, storing, handling, maintaining transferring and disposing of radioactive materials, ionizing radiation producing devices, lasers, and radio frequency/microwave radiation sources. Prepare and review applications for Army Radiation Authorizations, Army Permits and NRC Licenses. Manage and administer health physics/radiological engineering programs for the life cycle control of TACOM radioactive commodities utilized world wide which includes, but is not limited to, various states of research, development, test, production, deployment and disposal. Develop and provide guidance to Department of Defense elements worldwide in the radiological safety aspects of radioactive items of supply. Responsible for the evaluation of radiological safety programs and facilities at DATP, LATP, Selfridge ANGB base, TACOM and worldwide, to insure compliance with TACOM responsible Army Authorizations/Permits and NRC Licenses. Perform health physics surveys of TACOM responsible x-ray operations and of TACOM responsible laser operations.

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Aug 90 to Present: Nuclear Science Officer, State Radiation Safety Officer (SRSO), Michigan Army National Guard (MIARNG), Lansing, MI. Manage the MIARNG radiation program by resolving MIARNG radiation issues, improving/executing radiation program objectives, providing training, enforcing regulations and conducting inspections/surveys. Also, responsible for teaching on and managing other safety programs, supervising lower rank personnel, setting goals for the personnel and ensuring work/mission accomplishment.

Experience with Radiation

Radioactive Material

<u>Isotope</u>	<u>Maximum Activity</u>	<u>Duration of Experience</u>	<u>Type of Use</u>	<u>License</u>
1. Cs-137	6 mCi	12 years	Calibrate radiac equipment, health physics surveys and Leak tests (TACOM).	NRC License 21-01222-02, Manage License.
2. Ra-226	1.92 mCi	12 years	Calibrate radiac equipment, health physics surveys and leak tests (TACOM).	Army Auth. A 21-12-02, Manage Auth.
3. Am 241-Be Cs-137	50 mCi 10 mCi	17 years	Used in the MC-1 soil tester world wide by Army units.	NRC License 21-01222-05, Manage License.
4. Ra-226 Ni-63 Cs-137	0.7 uci 15 uCi 5 uCi 5 uCi	17 years	Used in dials and gauges and in spark igniters in vehicles worldwide.	Army Auth. A 21-12-04, Manage Auth.
5. Th 232	0.908 uCi/lb	17 years	Used in the combustor liner in the M-1 series tank worldwide.	Army Auth. A 21-12-05, Manage Auth.

Radiation Experience (Continued)

<u>Isotope</u>	<u>Maximum Activity</u>	<u>Duration of Experience</u>	<u>Type of Use</u>	<u>License</u>
6. Cs-137	50 mCi each Total 200 mci	10 years	Used in density gauges in a bag-House.	NRC License 21-01222-02, Manage License.
7. Th-232 H-3	0.06 uCi/unit 10 Ci/unit	17 years	Used in the M-1 series tank in the night sight, combustor liner and in the muzzle reference sensor at DATP and LATP.	Army Permits P21-DATP-12-01 P21-DATP-12-02 P21-DATP-12-03  P21-LATP-12-01 P21-LATP-12-02 P21-LATP-12-03 Manage Permits.
8. Tl-204 Cr-51 Co-60 Mn-54 Ra-226 Cs-137 Am 241-Be Cs-134 Eu-152 Ag-108 Na-22	0.3 uCi 1 uCi .2 uCi .247 uCi 4.96 uCi 9.6 uCi 5.3 uCi	Apr-May 1985	Laboratory work at Oak Ridge Assoc. University.	
9. DU		Jul 85  Present	Manufacture of DU containing items at Watertown, MA.  Installation of Heavy Armor in the Abrams Tank.	

Organization Membership:

American Society of Safety Engineers (ASSE)  
World Safety Organization  
Army National Guard Association

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Supplement B

Training for Individuals Working In or Frequenting Restricted Areas.

Supplement B

Training for Individuals Working In or Frequenting Restricted Areas.

1. Reference Item 8.

Operator Qualifications

2. Individuals who use the tester (operators) must successfully complete the training course conducted by the U.S. Army Engineer Center, Fort Leonardwood, MO. or have completed the training course that was taught by the U.S. Army Tank-automotive and Armaments Command (TACOM) New Equipment Training Branch, Warren, MI. The TACOM course is no longer conducted. The operator course consists of classroom lectures and hands on training in the proper operation, use and safety of the tester. The course requires successfully passing a written test. Trainees are required to perform satisfactorily, density and moisture content tests in the field using the nuclear density and moisture tester while observing all necessary safety precautions. Each student is tested in a hands on mode to insure they are aware of all safety precautions and operational procedures. The same training can be received from certified instructors sanctioned by the U.S. Army Engineer Center. The operator trainee will receive a course completion certificate which must be shown to the Local Radiation Safety Officer (LRSO) at a unit/location which has a tester. Replacement personnel to the units having a tester must also have successfully completed a training course and providing such proof to the LRSO.
3. The duration of the training course that was taught by the New Equipment Training Branch is sixteen hours. A breakdown of the hours and subjects of training is contained in the Program of Instruction, which follows in the Supplement B.
4. The training course taught by the U.S. Army Engineer Center consists of: specialized classroom lecture which contains radiation safety principles, transportation, storage, emergencies, wipe test procedures, recordkeeping and radiation theory. The trainees receive training in the operation and use of the tester.

Supplement B Continued

5. Instructors for training classes have received their training from either the President of Campbell Pacific Nuclear, Mr. Patrick Campbell, or through a Campbell Pacific Nuclear course or through a certified instructor trained through previously certified instructors at the U.S. Army Tank-automotive and Armaments Command New Equipment Training Branch or the U.S. Army Engineer Center. All of the instructors are certified by a certified instructor from the U.S. Army Tank-automotive and Armaments Command, New Equipment Training Branch and the U.S. Army Engineer Center. Instructors located outside of the U.S. Army Engineer Center must receive approval from the Engineer Center, prior to conducting tester operator training classes.

Local Radiation Safety Officer (LRSO) Qualification

6. A LRSO is required at each Army unit/location possessing the MC-1 Tester, which is also stated in the tester manual TM 5-6635-386-12 & P. The LRSO shall be a specialist, non-commissioned officer, commissioned officer or civilian. The LRSO's responsibility is to implement the tester radiation safety program at their respective location/unit.
7. Tester LRSO training must consist of the completion of the following courses:
  - a. Radiological Safety Course, 7K-F3-494-F14, U.S. Army Chemical School.  
or
  - b. Operational Radiation Safety Course, 4J-F2-494-F9, U.S. Army Chemical School.  
or
  - c. Calibrator Custodian Course, 4J-F1-493-F3, U.S. Army Chemical School and Technical Engineers Course (51T), U.S. Army Engineer Center.  
or
  - d. Army National Guard RSO Course, CECOM.  
or
  - e. USAREUR Local Radiation Safety Officers Course.  
or
  - f. A training program approved by the MACOM Radiation Safety Staff Officer (RSSO) and the TACOM Safety Office, ATTN: AMSTA-CS-CZ.  
or

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Supplement B Continued

g. Formal training consisting of:

1. Principles and Practices of Radiation Safety.
2. Biological Effects of Radiation.
3. Radiac Instrumentation and Monitoring Techniques.
4. Mathematics and Calibrations that are basic to the use and measurement of radioactivity.
5. Operation and use of the tester (i.e. leak testing, storage site surveys, transportation of the tester, etc.).

Note: The 7K-F3-494-F14 course is designed for the Radiation Safety Officer (RSO) of an installation with numerous radioactive commodities.

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**Supplement C**

**Facilities and Equipment**

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Supplement C

Facilities and Equipment

1. Reference Item 9.
2. The MC-1 tester is carried and stored in a specification 7A type AC transport case. See Supplement E for further storage requirements, which is stated in the tester manual TM 5-6635-386-12 & P.
3. One radiation detection survey instrument per storage site is required or the capacity to borrow such an instrument. The instrument will be used for health and safety purposes such as storage site surveys, leak test surveys and emergency situations (if they should arise). The instrument will be a VDR-2 or equivalent model. The instrument will measure gamma at a sensitivity range of 1 – 50 mr/hr.
4. The survey instrument used by the Army units for the MC-1 Tester will be actively calibrated to health and safety standards in accordance with Army regulations not to exceed a one year calibration frequency.

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Supplement D

Radiation Safety Program

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Supplement D

Radiation Safety Program

1. Reference Item 10.
2. There is no danger to the Army community and the general public when the tester is used, transported, stored, serviced and leak tested in accordance with the tester NRC License and the tester manual, and it presents a minimum hazard. Personnel using the testers are taught to maintain maximum distance from the tester sources and operate the tester with speed and efficiency. They are taught to always place the tester handle in the SAFE position when the tester is not in use, to not intentionally expose the Cs-137 source to the air and to not withdraw the source from the measurement site before returning the handle to the SAFE position.
3. Personnel are not authorized to smoke, eat or drink while handling the tester.
4. The tester can only be used by trained operators who are under the direction of a LRSO or by a person trained as an operator and LRSO. Only radiation safety officers and operators shall have access to the tester.
5. The time that personnel spend in the tester storage areas shall be kept to an absolute minimum.
6. **Maintenance.** Only limited and specific maintenance is authorized for the tester. Personnel authorized to perform maintenance are the operator and the LRSO. When required, the LRSO shall perform maintenance that is normally accomplished by the operator. Neither the operator nor the LRSO are authorized to repair or perform maintenance beyond what is authorized in the tester manual unless TACOM provides approval. The tester manual limits maintenance to:
  - a. The cleaning of tester external surfaces and shutter assembly.
  - b. Changing fuses.
  - c. Changing batteries.

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Supplement D Continued

Radiation Safety Program

- d. Charging batteries.
- e. Performing leak tests.

Operators of the tester are taught to not use the tester when it fails to operate in accordance with preoperational checks described in the tester manual, and to notify TACOM when they are unserviceable.

- 7. **Repair.** Repair not authorized by the tester manual or by TACOM will require the tester be sent to a designated manufacturer's repair facility or other licensed repair organization.

8. **Responsibilities.**

a. **TACOM.**

- 1. Monitor reports of radiation leakage tests, incidents and equipment improvement. Utilize feedback reports from logistic assistance teams, inspection teams and reports from major Army command Radiation Safety Staff Officers (RSSOs).
- 2. Account for each tester by serial number and issue testers to specific units.
- 3. Notify the NRC of any radiation incident/accident, radiation safety defects or hazards associated with the tester requiring reporting, and other actions that do not comply with Title 10, Code of Federal Regulations, Part 21.
- 4. Before issue of a tester to a unit, ensure unit has a trained LRSO, operator, dosimeters on an Army dosimetry program, an actively calibrated to health and safety standards radiation survey instrument and a compliant tester storage area.

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Supplement D Continued

Radiation Safety Program

5. Ensure tester using units obtain leak test kits for required leak tests. Contact late reporting units through the chain of command to verify serial number and location of testers.
6. Provide emergency response instructions and appropriate equipment (shielding material/devices) to tester units who are responding to tester emergencies.
7. Provide required authorizations and shipment instruction for transport of testers to include tester redistribution instructions.

**b. Commanders of Major Commands.**

1. Ensure compliance with applicable regulations, tester NRC License and the tester manual.
2. Establish and appoint a RSSO at the command level in accordance with Army regulations.
3. Ensure that each installation and activity that uses the tester has an effective radiation safety program.
4. Ensure the implementation of Title 10, Code of Federal Regulations (CFR), Parts 19, 20 and 21.

**c. MACOM RSSO.**

1. Ensure that the tester is properly handled to include performing required leak tests and surveys. Periodically inspect and audit the records of installation and activities that have the tester.
2. Ensure that radiation incident reports are submitted through the chain of command to TACOM not later than 24 hours after the incident has occurred. Also, notify TACOM of any radiation safety defects or hazards associated with the tester, and other actions that do not comply with Title 10, Code of Federal Regulations, Part 21.
3. Ensure that all tester locations under their jurisdiction have LRSOs.

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Supplement D Continued

Radiation Safety Program

4. Suspend use of the tester if a LRSO cannot be on-site within a reasonable response time, until a qualified operator and LRSO are available.
5. Forward LRSO or Operator (for tester assigned units without a LRSO) certificates of training and appointing orders to TACOM and any changes to such personnel.

**d. Using Unit Commander.**

1. Supervise implementation of the local radiation safety program in accordance with Federal and Army regulations.
2. Ensure compliance with appropriate instructions, regulations, the Tester NRC License and the tester manual.
3. Designate a trained LRSO and forward the appointing orders and certificate of training through the chain of command (i.e. Major Command, etc.) to TACOM. If no trained LRSO is available, then designate a certified operator for leak testing testers and provide this designation with a training certificate through the chain of command to TACOM. The operator designation is temporary until a trained LRSO is obtained.
4. Establish a Standard Operating Procedure (SOP) for use by using unit personnel that has been coordinated with the LRSO.
5. Suspend use of tester if no qualified LRSO is available. Assign the tester operator to maintain and wipe test the tester in accordance with the tester manual, until a trained LRSO is available.
6. Notify TACOM through the chain of command of any radiation safety defects or hazards associated with the tester, and other actions that do not comply with Title 10, Code of Federal Regulations, Part 21.

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Supplement D Continued

Radiation Safety Program

7. Obtain approval from both the MACOM RSSO and TACOM when transferring the tester from one unit to another, even within the same command and when requesting disposal instructions.
8. Notify the MACOM RSSO of any changes in LRSO assignment or tester operator assignment (if the using unit is without a LRSO).

**e. Local Radiation Safety Officer (LRSO).**

1. Advise the unit commander on all radiation matters and ensure that all testers under the commander's jurisdiction are properly used and stored.
2. Instruct personnel in subjects relating to safe work practices, emergency procedures, the harmful effects of radiation overexposure, and other required topics in accordance with Title 10 CFR Parts 19 and 29 CFR 1910.
3. Write and update the SOP for the units radiation safety program.
4. Report any radiation incident, accident or theft immediately through the chain of command to TACOM by the most expeditious methods available.
5. Perform required radiation leak tests and surveys.
6. Perform a background and an initial radiation survey of tester storage areas, upon receipt of the tester. Then conduct surveys minimally semiannually or when changes occur to the storage area, and when the storage area is closed-out. Copies of the surveys with the exception of the semiannual surveys will be provided to TACOM.
7. Make certain that the tester NRC License and other required documents are appropriately posted at the outside entrance to the storage area.

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Supplement D Continued

Radiation Safety Program

8. Ensure correct shipment of the tester to include preventing loss or unauthorized removal during shipment.
9. Review and maintain dosimetry records and ensure they are accurate in accordance with Army regulations.
10. Notify personnel on dosimetry of their annual dose.
11. Notify TACOM through command levels of personnel working with the tester declaring themselves to be pregnant.
12. As directed by Title 10 CFR Part 20 and in accordance with Army regulations limit radiation exposure to as low a level as can be reasonably achieved.
13. Ensure that unit personnel comply with radiation standards, the tester NRC License and the tester manual.
14. Notify the Unit Command and through the chain of command TACOM of any radiation safety defects or hazards associated with the tester, and with any other actions or circumstances that do not comply with Title 10 CFR Part 21.
15. Ensure that records are maintained for the tester and prepare/submit necessary reports in accordance with Army and federal regulations.
16. Ensure that radiation survey instruments used for the tester are available and actively calibrated to health and safety standards in accordance with Army regulations.
17. Send an annual memorandum to TACOM through the chain of command for non-unit bulk storage areas (i.e. Ft. McCoy, etc.). The memorandum must indicate who is the LRSO, serial number of testers, confirm the storage location of testers, that the tester hasn't been used and is being properly stored.

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Supplement D Continued

Radiation Safety Program

**f. Operator.**

1. Control the tester at the job site.
2. Do not leave the tester unattended, secure and lock the tester in its storage case and return it to its proper storage area.
3. Secure the tester when it is not in use and ensure that the tester is not used and in storage, when there is no trained LRSO assigned to the unit.
4. Notify the LRSO of any radiation safety defects or hazards that are associated with the tester.
5. Know the requirements of the tester NRC License and tester manual.
6. Wear a Thermoluminescent Dosimetry (TLD) Badge or other monitoring device when operating the tester, when in the storage area for the tester, and at other times as directed by the LRSO.
7. Perform leak tests in the absence of an assigned LRSO.
8. Forward training certificate if wipe testing the tester to the unit commander.

**9. Dosimetry.**

- a. Personnel who enter the tester storage areas or operate the tester, or at other times, as directed by the LRSO, shall wear Thermoluminescent Dosimetry (TLD) badges or other monitoring device. The Surgeon General has determined that neutron badges need not be worn by personnel using the tester. The Army using its National Voluntary Laboratory Accreditation Program (NVLAP) approved processor will supply and analyze the TLDs. The dosimeters will be exchanged out at least to the frequency recommended by the processor.

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Supplement D Continued

Radiation Safety Program

- b. Dosimeters are required to be stored in an approved location. Approval of the storage area coming from the LRSO.
- c. Pregnant personnel can handle/operate or maintain the tester as long as they wear dosimetry to account for the fetus exposure and coordinate with the Army NVLAP processor for the appropriate dosimetry. Notice of personnel declaring pregnancy or indications of personnel being pregnant will be forwarded to TACOM through the command levels by the LRSO. This notification is required to ensure exposure is as Low As Reasonably Achievable (ALARA) and below the NRC standards for fetus/public exposure.

**10. Surveys.**

Radiation surveys of the tester storage area will be conducted every six months by the LRSO. The exception being non-unit tester storage areas (i.e. bulk tester storage areas like Ft. McCoy, etc.) where radiation surveys will be required annually. Otherwise, background surveys, initial tester storage surveys, close-out storage area surveys and surveys for changes to storage areas will be conducted, and forwarded through the chain of command to TACOM.

**11. Leak Tests.**

- a. Because of the tester being of safe design and of the over 20 years of use with no leakage, testers (whether in storage or not) will be tested annually for radiation leakage versus every six months. The exception being non-unit storage areas (i.e. bulk tester storage areas like Ft. McCoy, etc.) where they will not be leak tested until they are to be used or transferred.
- b. Both sources in the tester will be leak tested when leak tests are required.

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Supplement D Continued

Radiation Safety Program

- c. If a tester is removed from storage from the non-unit storage areas (i.e. bulk tester storage areas like Ft. McCoy, etc.) for use or transfer, then it shall be tested before it is used or transferred.
- d. Any tester received from another person which is not accompanied by a certificate indicating that a leak test was performed within a year before the transfer shall not be put into use, until tested.
- e. Units/locations possessing the testers shall notify TACOM when leak tests are not received for the annual leak test. Also, non-unit tester storage areas are required to notify TACOM prior to a tester being put into use or transferred.

**12. Storage Areas.**

- a. **Unoccupied.** Testers will be stored in locked, unoccupied and isolated areas. Fire resistant structures which provide protection from the weather shall be used when they are available. Only work that is necessary for normal storage and maintenance procedures shall be performed in these storage areas. Entrances to the storage area will have posted radiation caution signs.
- b. **Occupied.**
  - 1. The numbers of testers that can be safely stored, in either occupied buildings or in occupied areas, is determined by shielding, the distance from the source and that part of the area which is occupied.
  - 2. A tester which has been packed in its approved carrying case may be stored in a supply area or weapon storage area, provided the following:
    - a. The cased tester is locked into a metal storage container.
    - b. The metal storage container is isolated and located as far as possible from personnel work stations.
    - c. That required radiation caution signs are posted on the metal storage container and on the door leading to the storage area.

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Supplement D Continued

Radiation Safety Program

d. The area marked around the metal storage container to indicate when radiation readings are above background radiation levels requiring dosimetry. Only TLD wearing personnel will enter the area indicating above background radiation levels.

**13. Required Postings.**

- a. Radiation caution signs will be posted on entrances leading to tester storage areas and on metal storage containers storing testers in occupied areas.
- b. NRC Form 3 will be posted at tester storage areas.
- c. A notice will be posted at the tester storage area of where Title 10 CFR Parts 19, 20 and 21 can be obtained/reviewed.
- d. Section 206, Energy Reorganization Act of 1974 (Public Law 93-438) will be posted at tester storage areas.
- e. A notice will be posted at the tester storage area of where the tester NRC License can be reviewed.
- f. A notice will be posted at the tester storage area of where the units tester radiation safety program (SOP) can be reviewed.

**14. Transportation.** Tester will be transported in accordance with Title 49 CFR. It will be packed and locked in its approved carrying case during transport. The case shall be properly secured to prevent damage to it and the tester during transport. The tester will be secured from unauthorized access or removal during transportation. Transportation of the tester is required to be coordinated with TACOM through the chain of command.

**15. Emergency Procedures.**

- a. Tester Damage (Fire and Explosion).
  - 1. Immediate notification of the LRSO and TACOM through command levels is required.

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Supplement D Continued

Radiation Safety Program

3. Emergency response personnel shall notify personnel who are not directly involved in the emergency to clear the area.
4. Emergency response personnel will notify fire fighting and other emergency personnel of the situation.
5. When a radiological hazard is not immediately imminent, attempt to extinguish fires with first-aid type extinguishers. Try to prevent water or firefighting chemicals from coming into contact with radioactive sources.
6. The LRSO will monitor personnel who were in the emergency area and who combated the emergency. The LRSO will monitor the area and determine those protective measures that are necessary for the removal of radiation hazards.

b. Tester Loss.

1. The LRSO shall be notified immediately.
2. The LRSO will conduct with the Army unit a physical search.
3. When the tester cannot be recovered, the LRSO will immediately notify TACOM through command levels (to include the RSSO). The report will include the circumstances of the loss, actions taken to recover the tester and procedures to prevent recurrence.

c. Damaged or Leaking Tester.

1. Damaged.

- a. When the shutter fails to close or is damaged, the LRSO shall: Immediately discontinue use of tester and place the tester in a shipping case locking it. Placing the shipping case in an isolated locked area and securing it against unauthorized handling. Then notifying immediately TACOM through command levels

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Supplement D Continued

Radiation Safety Program

(MACOM RSSO, etc.) of the problem and await TACOM instructions.

- b. If the tester probe with the Cs-137 source won't retract, leave the tester in place with the source in the ground. Then cordon off area so that no personnel will enter the area and notify the LRSO. The LRSO shall through command channels notify TACOM and await instructions.
2. Leaking. Leaking is defined as a tester with a reading of 0.1 mrem/hr or more (or in the case of Colorado 0.2 mrem/hr or more) is obtained from the leak test swab. The swab being considered contaminated and disposed of as radioactive waste. Also, a leaking tester is defined as laboratory leak test results of 0.005 or more microcuries.
    - a. The LRSO shall immediately notify TACOM through command levels.
    - b. Tester will be immediately discontinued from use.
    - c. The tester will be wrapped up and labeled to indicate that its contaminated.
    - d. The LRSO will monitor personnel, equipment, and the area for contamination. The LRSO will decontaminate as required.
    - e. The tester will be disposed of or repaired as directed by TACOM in accordance with Army regulations.
    - f. Overexposure.
      1. Personnel shall immediately report to the LRSO and medical officer.
      2. If the skin reads higher than background radiation levels, then the individual shall immediately wash.

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Supplement D Continued

Radiation Safety Program

3. Immediately remove clothing that monitors at 0.2 mrem/hr or more at a distance of 2.5 centimeters (about one inch). Place clothing and cleaning up rags into a radioactive waste disposal container, and dispose of as radioactive waste.
4. The LRSO shall notify TACOM through command channels of the overexposure. Medical intervention will follow and future limitations of exposure may follow for the personnel.

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**Supplement E**

**Waste Management**

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Supplement E

Waste Management

1. Reference Item 11.
2. The MC-1 testers will be sent to the manufacturer or to other licensed organizations for disposal in accordance with Army regulations.
3. The license is exempt from financial assurance and decommissioning activity requirements, per 10 CFR Part 30. This is due to the sources being encapsulated/sealed or below financial assurance radioactive material limits.

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**Supplement F**

**Accountability and Physical Inventory of Testers**

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Supplement F

Accountability and Physical Inventory of Testers

1. Physical inventory of soil testers is conducted on an annual basis by the LRSO (licensee approved representative). The licensee's inventory is verified by the annual leak test results for each tester and in the case of a tester in storage (non-unit storage location strictly for tester storage, i.e. Ft. McCoy, etc.), an annual memorandum from the LRSO. Tester serial number and location is individually certified by LRSO signature. Late reporting units are individually contacted by the licensee for verification of serial number and location of the tester.
2. The TACOM accountability and physical inventory practices are outlined above, provide for 100% accountability of all MC-1 testers. A random sample of MC-1 tester locations are surveyed each year, as an internal audit of the Army MC-1 tester radiation safety program by Army organizations. This random sampling is used to identify problem areas existing with MC-1 tester users and fix them.
3. Plans for transportation of the testers to field sites by using units are required to be coordinated with TACOM through their chain of command. Redistribution of testers in the field occur with the written authorization of TACOM. TACOM provides individual guidance germane to the unit/location with shipping instructions.
4. If after 30 days of receipt of disposition instructions and no action is evident by the unit/location, TACOM will inquire into the given testers shipment status.
5. Storage of testers awaiting disposition is at Defense Distribution San Joaquin, Stockton, CA. This site has its own NRC license for the storage of the MC-1 Tester. Disposition of the testers is controlled by TACOM.

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Supplement G

Environmental Impact Statement

License Renewal 21-01222-05

Supplement G

Environmental Impact Statement

The MC-1 Tester, Density and Moisture Nuclear Method is categorically excluded by 10 CFR Part 51.22 © (14) (viii) from environmental documentation. The soil tester falls under the category of devices containing sealed sources which is exempted from environmental documentation.