*TB 11-6665-227-12

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

SAFE HANDLING, STORAGE, AND TRANSPORTATION OF CALIBRATOR SET, RADIAC AN/UDM-2 (NSN 6665-00-179-9037)

Headquarters, Department of the Army, Washington, DC
1 June 1986

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Encl 3

SAFETY PRECAUTIONS

Calibrator Set, Radiac AN/UDM-2 will be used only under the direction of a Radiation Protection Officer. Do not eat, drink, or smoke while using or handling the AN/UDM-2. After handling the AN/UDM-2 wash the hands thoroughly with warm water and mild soap. Dry the hands thoroughly and monitor them for radioactive contamination with the AN/PDR-27(*) Radiac Set or equivalent . Do not place hands or body in front of the open port of the calibrator. Calibrator Set, Radiac AN/UDM-2 is used throughout the Army under a US Nuclear Regulatory Commission (NRC) license held by the US Army Communications-Electronics Command Safety Office, Fort Monmouth, New Jersey. Information about the NRC license may be requested by letter to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024. The Safety Office may also be contacted by telephone on Autovon 995-4427 or commercial (201) 544-4427.

1. Purpose. This bulletin prescribes the minimum safety precautions that are essential during the handling, storage, issue, transportation, accountability, and use of Calibrator Set, Radiac AN/UDM-2.

NOTE

Official nomenclature followed by (*) is used to indicate all models of the equipment covered in this bulletin. Thus, Radiac Set AN/PDR-27(*) represents Radiac Sets AN/PDR-27J, AN/PDR-27L, AN/PDR-27P, AN/PDR-27Q, AN/PDR-27R and later models.

2. Consolidated Index of Army Publications and Blank Forms. Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

3. Reporting Errors and Recommending Improvements. You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007 and furnish a copy to the CECOM Safety Office, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024. In either case, a reply will be furnished direct to you.

4. Description. Calibrator Set, Radiac AN/UDM-2 contains a total of 180.0 millicuries of Strontium 90 (Sr-90) and consists of Calibrator, Radiac TS-3494/UDM-2 and Calibrator, Radiac TS-3495/UDM-2. Calibrator, Radiac TS-3494/UDM-2 contains 45 millicuries of Sr-90 and is used to calibrate contingent Radiacmeters IM-174(*)/PD, Radiac Set AN/PDR 27 (*), Radiac Set AN/PDR-60, Aerial Radiac System AN/ADR-6, and Radiac Set AN/VDR-2. Calibrator, Radiac TS-3495/UDM-2 contains 135 millicuries of Sr-90 and is used for serviceability testing of Radiacmeters IM-9(*)/PD, IM-147/PD, IM-93(*)/UD, and IM-185(*)/UD.

5. Calibrator Set, Radiac AN/UDM-2, General.

a. Calibrator Set, Radiac AN/UDM-2 is marked in accordance with Title 10, Code of Federal Regulations, Part 20.

b. Calibrator Set, Radiac AN/UDM-2 is nonexpendable.

c. Calibrator Set, Radiac AN/UDM-2 may be transferred only to another qualified Radiation Protection Officer (RPO) (paragraph 9).

d. Calibrator Set, Radiac AN/UDM-2 will be disposed of only on instructions of Commander, US Army Communications-Electronics Command and Fort Monmouth. ATTN: AMSEL-MME-VC, Fort Monmouth, NJ 07703-5006.

e. Leak tests must be performed at intervals not to exceed six months on all Calibrator Sets, Radiac AN/UDM-2, except those sets located in areas of active fighting between enemy forces (combat areas).

f. All correspondence relating to certification of RPO's or control of Calibrator Set, Radiac AN/UDM-2 should be addressed to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024 through the Radioactive Material Control Point (RMCP).

6. Inherent Danger. *a.* The radioactive Sr-90 sources in Calibrator Set, Radiac AN/UDM-2 emit beta radiation. Interaction of this beta radiation with the radiac calibrator set housing results in the emission of X-rays (Bremsstrahlung). Excessive absorption of ionizing radiation by the human body may be injurious (AR 40-14). The radioactive sources will not be removed from the radiac calibrator set, except by qualified personnel located at Lexington-Blue Grass Depot Activity (LBDA).

b. Familiarity with these criteria and strict observance of the radiation protection procedures contained in the following paragraphs are essential.

7. Applicability. The provisions of this technical bulletin (TB) apply to all persons and activities who have the responsibility for the handling, transportation, storage, and use of any issued Calibrator Set, Radiac AN/UDM-2. This TB does not apply to the Army stocks of radiac calibrator sets stored in authorized storage depots.

8. Responsibility. *a. Responsibilities of Major Commands (MACOM).*

(1) Establish at least one RMCP (AR 385-11).

(2) Appoint a Radiation Control Officer (RCO) for each RMCP and forward two copies of appointee's orders and qualifications to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024.

(3) Develop implementation procedures to insure periodic leak testing and forwarding two copies of procedures to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024.

(4) Forward leak and wipe test smears to the approved smear counting laboratory for evaluation.

(5) Ensure that each installation or activity using the AN/UDM-2 has an effective and documented radiation protection program.

b. Responsibilities of Radiation Control Officer.

(1) Review and approve the qualifications of each local RPO for the AN/UDM-2 and forward to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024, a list of these local RPO's and their qualifications for approval and certification.

(2) If a qualified local RPO is not available, take one or more of the following actions:

(a) Suspend the requisition for the AN/UDM-2.

(b) Suspend the use of AN/UDM-2 until someone can be qualified by training.

(c) Transfer the AN/UDM-2 to an installation or activity with qualified personnel.

(3) Maintain the following records for each AN/UDM-2 under his control:

(a) National stock number.

(b) Description

(c) Serial number.

(d) Isotope, source activity.

(e) Dates and results of leak tests.

(f) Shipment number.

(g) Shipped from.

(h) Shipped to.

(i) Date shipped.

(j) Name and qualifications of local RPO's.

(k) Radiation incident reports.

(4) Notify Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024, within 30 days of permanent transfer of AN/UDM-2 within *or* between major commands.

(5) Ensure that AN/UDM-2 is properly handled in accordance with Army and NRC regulations. Periodically inspect and audit records of installations and activities possessing the AN/UDM-2.

(6) Assure that a Radiation Incident Report is submitted by electrical means to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024 within 24 hours, when an incident occurs.

(7) Forward DA Form 3252-R (Radioisotope Inventory and Leak Test Report) (RCS DRC 192) listing all Calibrator Sets, Radiac AN/UDM-2 in area of responsibility to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024 at least semiannually (31 January and 31 July). Reports may include information on other CECOM managed calibration and test items of supply listed in AR 385-11.

9. Supervision. *a.* All calibration in which Calibrator Set, Radiac AN/UDM-2 is used will be supervised by a qualified RPO. Supervision in this sense is used to indicate performance of all duties listed in paragraph 11. To be a qualified RPO, a person must have received a *minimum of 40 hours* formal training on radiation including the following topics:

(1) Principles and practices of radiation protection.

(2) Biological effects of radiation.

(3) Radioactivity measurement standardization and monitoring techniques and instruments.

(4) Mathematics and calculations basic to the use and measurement of radioactivity.

(5) The operation and use of the AN/UDM-2.

NOTES

1. Completion of the Radiological Safety Course or the Radiac Calibrator Custodian Course at the US Army Chemical School or at the US Army Ordnance Center and School meet these requirements.

2. When circumstances warrant, alternate training may be substituted if this training is approved by Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024. Such training must be received under the guidance of a qualified RPO, and must include at least 16 hours of actual experience in the use of the AN/UDM-2.

b. The person appointed as RPO may be a commissioned officer, a warrant officer, enlisted person, or civilian, if he/she meets the minimum qualifications prescribed above. An RPO/designated custodian for the AN/UDM-2 is a specified person designated to control the use of the AN/UDM-2.

c. The operator or user of the AN/UDM-2 shall have a minimum of 8 hours training under the guidance of a qualified RPO for the AN/UDM-2 in the basic fundamentals of radiological operations, radiac instrumentation theory and application and survey techniques and 16 hours on-the-job training in operation and care of the AN/UDM-2. Instructions shall include safe working practices and inherent hazards associated with the calibrator.

10. Storage and Work Areas. *a.* Storage areas and work areas where the AN/UDM-2 is used will be considered controlled areas and will be marked in accordance with AR 385-30. If a radiation area is in the same vicinity of areas which are occupied by the individuals who are not designated as radiation workers, the radiation level in the unmarked area must be such that personnel will not be exposed to ionizing radiation in excess of 2 millirems in any one hour; or 100 millirems in any 7 consecutive days; or 0.5 rem in one calendar year. Unnecessary exposure of personnel in this area will not be permitted. (For the purpose of this document, 1 millirem is equal to 1 milliroentgen or millirad).

b. Store Calibrator Set, Radiac AN/UDM-2 in a locked container or area that permits external radiation levels in potentially occupied areas no greater

than 2.0 millirems per hour (mrem/hr). Access to the container stored in a locked area shall be controlled by the RPO. Storage instructions are as follows:

(1) One or more AN/UDM-2's may be stored in a locked container constructed of wood or metal. The size of the container may be varied; however, the radiation level on the outside of the container shall not exceed 2.0 mrem/hr. The inside of the container may be lined with sheet lead to reduce the radiation intensity to an acceptable level. The container must be marked in accordance with AR 385-30.

(2) One or more AN/UDM-2's may be stored in a locked room of such dimensions and construction that the radiation level at any point outside the room does not exceed 2.0 mrem/hr.

(3) Storage containers and rooms will be marked as radioactive materials storage in accordance with AR 385-30.

c. Only authorized, qualified personnel will be permitted to enter the storage or calibration areas alone. These areas will be physically secured and safeguarded when in use. Visitors must be escorted by the RPO or a qualified user and must be briefed on radiation hazards and precautions to minimize these hazards.

d. Storage areas and areas where equipment is being calibrated will be surveyed and documented at least monthly (Appendix B, sample survey form).

e. AN/PDR-27(*) or equivalent will be used to monitor controlled areas at all times when equipment is being calibrated with the AN/UDM-2.

f. AN/PDR-27(*) or equivalent radiac sets that are used to survey and monitor the AN/UDM-2 storage and calibration areas will be marked with embossing tape, with the word "Active" and must be calibrated at two points on each scale by a source traceable to the National Bureau of Standards. This requirement specifically excludes the use of the AN/UDM-2 as a calibration source for "Active" (Health and Safety) survey meters.

g. The cyclic calibration interval for "Active" survey meters is 90 days (TB 43-180).

h. Personnel monitoring devices will be used when entering the storage or calibration areas or when operating Calibrator Set, Radiac AN/UDM-2 (AR 40-14). Operators will use wrist-type film badges in addition to whole body badges.

i. Form NRC-3, Notice to Employees, contained in this TB, should be removed for posting wherever the AN/UDM-2 is used and/or stored. The posting requirements are contained on the form.

j. Section 206, "Energy Reorganization Act of 1974", (10 CFR Part 21) contained in this TB, should be removed for posting whenever the AN/UDM-2 is used and/or stored. The posting requirements are contained in Appendix D.

11. Duties of the Radiation Protection Officer for the AN/UDM-2. The specific duties of the appointed RPO will be to:

a. Ensure that AN/UDM-2's under their jurisdiction are properly used and stored.

b. Train local users and operators and maintain list and record of training of users and operators.

c. Ensure records are maintained on each item.

d. Advise the RMCP of any forthcoming change in accountability, local RPO, or installation relocation for the AN/UDM-2.

e. Establish controlled areas for AN/UDM-2 storage and use.

f. Post Radiation Area and Radioactive Materials warning signs as appropriate.

g. Ensure the AN/UDM-2 Radiac Calibrator Sets are stored in a structure away from flammable liquids and explosives.

h. Ensure film badges are worn as required and that film badge exposures are recorded.

i. Ensure that periods of time between leak tests do not exceed 6 months and perform the leak tests.

j. Secure the AN/UDM-2 Radiac Calibrator Set against unauthorized use and removal.

k. Ensure that all Army and Federal regulations are being followed and that personnel are exposed to a minimum of radiation consistent with practical considerations.

l. Conduct a semiannual physical inventory.

m. Submit inventory, leak test, and other reports to RMCP as required.

n. Prior to relief from duties, place all AN/UDM-2's under this jurisdiction in locked storage or transfer to authorized activity.

o. Immediately refer actual or suspected overexposure to medical officer.

p. Submit Radiation Incident Report according to published directives.

q. Investigate each case of excessive or abnormal exposure to determine the cause, recommend remedial action to prevent recurrence, and submit a complete written report to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024, within 24 hours (paragraph 8b(6)).

r. Conduct and maintain records of annual training for all AN/UDM-2 radiation workers.

12. Requisitioning Procedure. Stations in CONUS and oversea supply agencies will submit requisitions through RMCP channels to Commander, US Army

Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-MME-VC, Fort Monmouth, NJ 07703-5006, or issue to certified RPOs. All requisitions will be accompanied by the name and phone number of the RPO who is to be responsible for the equipment. In addition, each request will include the following certification: "As required by Chapter 3, AR 385-11, sufficient safety equipment, facilities, and trained personnel are available at this installation for the safe handling, use and storage of radioactive material ordered on this requisition." The certification must have the signature and the typed name and grade of the appropriate RPO. Requisitions that do not meet this requirement will be returned for proper information.

13. Leak Testing Procedure.

a. General.

(1) Safety Precautions.

(a) The RPO or alternate is required to perform the leak test and must be thoroughly familiar with the equipment.

(b) Each person performing the leak test will wear whole body and wrist film badges.

(c) Do not under any circumstance expose the eyes to the radiation field by peering into the access hole while the swivel cover is swung aside on the discharge well assembly (TS-3495/UDM-2).

(2) Equipment required.

(a) Cotton swabs furnished by the US Army Ionizing Radiation Dosimetry Center (AIRDC) at LBDA.

(b) Distilled or clean tap water.

(c) Plastic bags furnished by AIRDC.

(d) Radiacmeter AN/PDR-27(*) or equivalent.

(e) Long nose pliers.

b. Leak Test - Discharge Well Assembly (TS-3495/UDM-2).

(1) Take the cotton swab furnished and fill in the date and serial number on the paper tab.

(2) Moisten the swab with distilled or clean tap water.

(3) Swing aside the swivel cover.

(4) Using the moistened swab and long nose pliers carefully wipe the inside surface of the access hole.

WARNING

After removal of the swab from the access hole, DO NOT lay the swab down or allow it to touch any other object.

(5) Using the procedure in subparagraphs d below, check the swab for contamination.

c. Leak Test-Doserate Jig Assembly (TS-3494/UDM-2).

(1) Repeat steps 1 and 2, paragraph 13b, above.

(2) Open the drawer in the Doserate Jig.

(3) Using a moistened cotton swab, wipe the inside and outside surfaces of the drawer.

(4) Close the drawer.

WARNING

After wiping the drawer, DO NOT lay the swab down or allow it to touch any other object.

(5) Using the procedure in subparagraph d below, check the swab for contamination.

d. Checking for contamination and mailing cotton swabs.

NOTE

Perform the following procedures in an area that is free from all radiation, except for normal background radiation.

(1) Adjust Radiac Meter, AN/PDR-27(*), to measure 0 to 0.5 mR/hr.

(2) Open cover on end of probe.

(3) Place the cotton swab approximately 1/4 inch in front of the probe and note the indication: DO NOT TOUCH THE PROBE WITH THE COTTON SWAB.

WARNING

Any sustained reading on the AN/PDR-27(*) above twice background or 0.1 mR/hr indicates contamination of the AN/UDM-2. Discontinue use of the AN/UDM-2 immediately, and refer to paragraph 16 for action to taken.

(4) Place the cotton swab in the plastic bag provided and proceed as follows:

(a) If no detectable reading is observed on the AN/PDR-27(*), place the plastic bag and swab in the self-addressed envelope provided, and mail immediately to AIRDC.

(b) If a reading is observed on the AN/PDR-27(*), in excess of 0.1 mR/hr or twice the background, the plastic bag and swab should be placed in a small cardboard box and mailed to AIRDC.

WARNING

The radiation reading at the surface of the box must not exceed 0.4 mR/hr. If the measured radiation is more than 0.4 mR/hr, wrap a thin sheet of lead, aluminum, or other metal around the plastic bag and place in a small cardboard box and recheck the surface radiation.

14. Transportation of the AN/UDM-2. The AN/UDM-2 requires shipment in accordance with the requirements of the US Department of Transportation (DOT) as set forth in Title 49, Code of Federal Regulations (49 CFR), AR 384-11 and NRC License 29-01022-08.

a. Upon receipt of the AN/UDM-2 contact the US Army Communications-Electronics Command Safety Office by phone on Autovon 995-4427 or commercial (201) 544-4427 or by electronic means, ATTN: AMSEL-SF-MR.

b. Shipment of AN/UDM-2 by US Postal Service is prohibited (USPS Publication 52).

c. For shipment of the AN/UDM-2 to be in accordance with the above regulations and NRC license the following requirements must be met.

(1) The AN/UDM-2, consisting of both TS-3494/UDM-2 and TS-3495/UDM-2, meets the requirements for Type "A", DOT-7A shipping container. When assembling the AN/UDM-2, care must be taken to assure that the manual valve located on the TS-3494/UDM-2 is turned clockwise to the closed position to avoid damaging the manual valve. It should be noted that a damaged manual valve may void the AN/UDM-2 container from being considered as a Type "A", DOT-7A shipping container. To prevent damage to the painted surface and to provide space for shipping labels, a cardboard overpack is required (Special Packaging Instruction SPI 1G00152, Appendix E).

(2) The overpack must be sealed with fiber tape, labelled on opposite sides with Radioactive Yellow-II labels (49 CFR 172.403) and marked with 1/2 inch or larger letters with the following: TYPE 'A' DOT-7A, RADIOACTIVE MATERIALS, SPECIAL FORM, NOS, UN 2974.

(3) A shipping package wipe test must be performed to assure that no significant removable radioactive surface contamination exists on the exterior of the package (49 CFR 173.443, 173.475 (i)).

(a) The wipe test procedure to be used is contained in paragraph 15 of this TB. A DOT wipe test kit is provided by AIRDC.

(b) The wipe test must be performed within two weeks prior to the desired shipping date.

(c) Evaluation of the wipe test must be received from AIRDC prior to shipment.

(4) Report of shipment (RESHIP) must be transmitted to the receiving installation transportation officer (AR 385-11, para 4-1) with information copy to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024.

(5) The following information must be listed on the shipping documentation as required by 49 CFR 172.200, 172.202, 172.203(d), 172.204, and AR 385-11, paragraph 4-1a.

(a) Proper shipping name: RADIOACTIVE MATERIAL, SPECIAL FORM, NOS.

(b) Hazardous Material Identification Number: UN 2974.

(c) Pieces, weight and volume: Required.

(d) Type of packaging: Type "A" DOT-7A.

(e) Radioactive material: Strontium-90

(f) Description of chemical and physical form: SPECIAL FORM.

(g) Activity: 180.0 millicuries or as indicated on the AN/UDM-2.

(h) Type label required: Radioactive Yellow-II.

(i) Shipper's certification: Required.

(j) NRC License Number: 29-01022-08.

(k) Exposure rate at the package surface and at one meter: As determined by RPO.

(l) Results of package wipe test: As determined by AIRDC.

(6) Commercial air shipment of the AN/UDM-2 requires, in addition to 5 above, a "cargo aircraft only" label on opposite sides of the shipping package and the words "Cargo Aircraft Only" listed on the shipping documentation (49 CFR 175.30).

(7) Basic requirements for shipment of radioactive materials by military (USAF Cargo) aircraft are contained in Chapter 12 of AFR 71-4/TM 38-250.

15. Wipe Testing Procedure for Shipment. *a.* The shipping package wipe test is performed for compliance to DOT regulations, to assure that no significant removable radioactive surface contamination is located on the exterior of the shipping package.

b. Equipment required:

(1) Smear, NuCon or equivalent (1.75 inch diameter circular cloth adhered to an associated paper jacket).

(2) Envelope, pre-addressed to AIRDC.

(3) Radiac Meter, AN/PDR-27(*) or equivalent.

NOTE

The smear is never to be used for sealed source leak testing (paragraph 13) of the AN/UDM-2 Radiac Calibrator Set, Dosimeter Discharge Well Assembly or Doserate Jig Assembly. It is *only* to be utilized in the wipe testing of the exterior surfaces of the outer shipping package incorporating the AN/UDM-2 Radiac Calibrator Set.

c. Wipe test procedure.

(1) Record date, name of the individual performing the test, and serial number(s) of the AN/UDM-2 Radiac Calibrator(s) on the jacket of the NuCon Smear.

(2) With the smear retained within its jacket and using moderate finger pressure, wipe on all exterior surfaces of the package for a total of at least 300 square centimeters (about 48 square inches).

d. Checking for contamination and mailing the smear.

NOTE

Perform the following procedure in an area that is free from all radiation, except for normal background radiation.

(1) Adjust Radiac Meter, AN/PDR-27(*) to measure 0 to 0.5 mR/hr.

(2) Open cover on end of probe.

(3) Place the smear approximately 1/4 inch in front of the probe and note the indication: DO NOT TOUCH THE PROBE WITH THE SMEAR.

WARNING

Any sustained reading on the AN/PDR-27(*) above twice background or 0.1 mR/hr indicates contamination of the shipping package. Secure shipping package to prevent the spread of contamination and refer to paragraph 16d for action to be taken.

(4) If no detectable reading is observed on the AN/PDR-27(*), place the smear in the self-addressed envelope provided, and mail immediately to AIRDC.

(5) If a reading is observed on the AN/PDR-27(*), in excess of 0.1 mR/hr or twice the background, the smear should be placed in a small cardboard box and mailed to AIRDC.

WARNING

The radiation reading at the surface of the box must not exceed 0.4 mR/hr. If the measured radiation is more than 0.4 mR/hr, wrap a thin sheet of lead, aluminum, or other metal around the smear and place in a small cardboard box and recheck the surface radiation.

(6) Notification of the results of the shipping package wipe test must be received from AIRDC prior to making shipment of the AN/UDM-2 Radiac Calibrator Set(s).

16. Emergency Procedures. The procedures outlined below will be followed in an emergency situation.

a. Loss of Calibrator.

(1) Attempt to recover the radiac calibrator set.

(a) Review records to determine the responsible individual.

(b) Make a physical survey.

(c) Notify security of the loss including associated hazards.

(2) If the radiac calibrator set is recovered, revise procedures as necessary to prevent a recurrence.

(3) If the radiac calibrator set is not recovered, report the loss through command channels to the RMCP (AR 385-11) and to the US Army Communications-Electronics Command Safety Office within 24 hours of the occurrence, stating the serial number of the radiac calibrator set, the circumstances involved, and the action taken to prevent recurrence.

b. Excessive Personnel Exposure (AR 40-14). If an individual receives a dose of ionizing radiation from an AN/UDM-2 in an amount exceeding 416 millirem in one month, the following actions will be taken:

(1) Obtain immediate medical advice from the Medical Officer.

(2) Remove the individual from duties involving occupational exposure to ionizing radiation until subsequent exposure limitations are established by proper medical authority (AR 40-14).

(3) Prepare written report of circumstances leading to overexposure. Include serial number(s) of the AN/UDM-2 involved, actions taken to prevent recurrence, and other applicable information. Forward the report through proper channels to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-SF-MR, Fort Monmouth, NJ 07703-5024.

c. Damage or Leaking AN/UDM-2. An AN/UDM-2 could begin to leak as a result of being dropped, damage to the source, or even as a result of age. Action required in the event of a known or suspected leaking calibrator is:

(1) Discontinue use of the calibrator. Cover it with plastic, seal it with tape, and label it as contaminated.

(2) Monitor personnel, equipment, and areas for possible contamination and decontaminate as required.

(3) Report the item, telephonically within 24 hours, to the RMCP and to the US Army Communications-Electronics Command and forward a written report within 10 days.

(4) Dispose of the AN/UDM-2 as directed by the US Army Communications-Electronics Command.

(5) Report the completed disposal action to the US Army Communications-Electronics Command and the RMCP.

d. Contaminated shipping package. If the wipe test procedure (paragraph 15) indicates excessive contamination, the following actions will be taken:

(1) Discontinue shipping procedure.

(2) Cover the shipping package with plastic, seal it with tape, and label it as contaminated.

(3) Monitor personnel, equipment, and areas for possible contamination and decontaminate as required.

NOTE

See AR 385-11 for contamination limits.

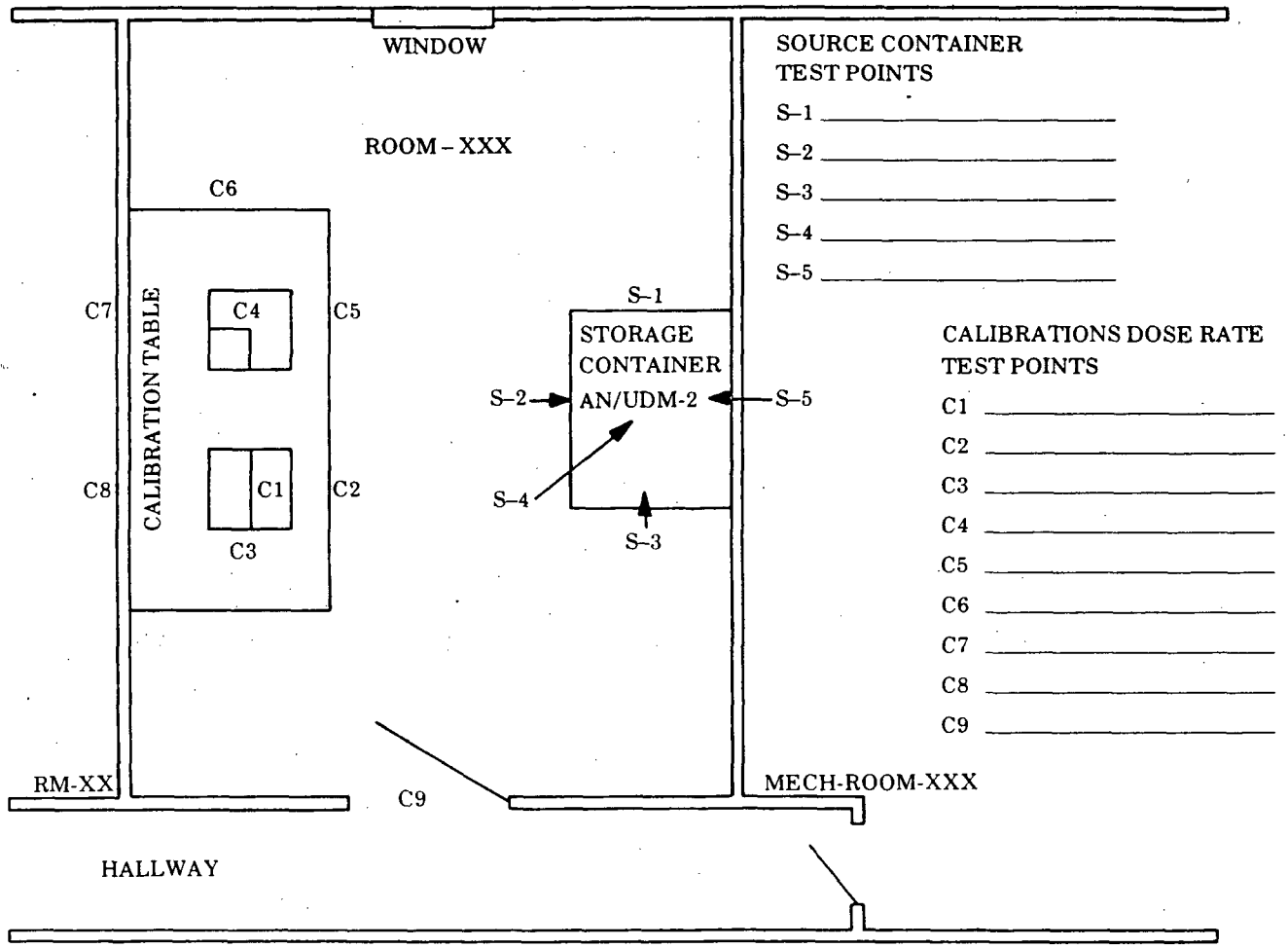
(4) Report the contaminated shipping package to the RMCP and to the US Army Communications-Electronics Command within 24 hours of the occurrence.

APPENDIX A
REFERENCES

AR 40-14	Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials (DLAR 1000.28).
AR 385-11	Ionizing Radiation Protection (Licensing, Control, Transportation, Disposal, Radiation Safety).
AR 385-30	Safety Color Code Markings and Signs.
DA Pam 310-1	Consolidated Index of Army Publications and blank forms.
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
MIL STD-129	Marking for Shipment and Storage.
TM 11-6665-209-10	Operator's Manual for Radiac Set, AN/PDR-27 (NSN 6665-00-543-1435), AN/PDR-27L (6665-00-756-3456) and AN/PDR-27Q (6665-00-017-8903).
TM 11-6665-209-20	Organizational Maintenance Manual for Radiac Sets, AN/PDR-27J (NSN 6665-00-543-1435), AN/PDR-27L (6665-00-856-3456) and AN/PDR-27Q (6665-00-017-8903).
TM 11-6665-209-40	General Support Maintenance Manual for Radiac Sets, AN/PDR-27J (6665-00-543-1435), AN/PDR-27L (6665-00-856-3456), and AN/PDR-27Q (6665-00-017-8903).
TM 11-6665-213-12	Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Radiacmeter IM-174/PD.
TM 11-6665-213-40	General Support Maintenance Manual (Including Repair Parts and Special Tool List) Radiacmeter IM-174/PD (NSN 6665-00-856-8037).
TM 11-6665-224-15	Operators, Organizational, Direct Support, General Support, and Depot Maintenance Manual Radiac Set AN/PDR-27P (NSN 6665-00-975-7222).
TM 11-6665-228-15	Operator's, Organizational, Direct Support, and Depot Maintenance Manual for Radiac Set, AN/PDR-27G.
TM 11-6665-230-15	Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tools Lists: Radiac Set AN/PDR-27R.
TM 11-6665-232-12	Operator's and Organizational Maintenance Manual for Radiacmeters, IM-174A/PD (NSN 6665-00-999-5145) and IM-174B/PD (6665-01-056-7422).
TM 11-6665-232-40	General Support Maintenance Manual for Radiacmeters, IM-174A/PD (NSN 6665-00-999-5145) and IM-174B/PD (6665-01-056-7422).
TB 9-6665-285-15	Army Calibration Program for Radiac Survey Meters.
TB 43-180	Calibration and Repair Requirements for the Maintenance of Army Materiel.
Title 10, Code of Federal Regulations, Parts 19, 20 and 21	
Title 49, Code of Federal Regulations.	
SPI No. 1G00152	Special Packaging Instruction.

APPENDIX B
SAMPLE SURVEY FORM FOR AN/UDM-2

RADIAC ROOM - BLDG XXX



DATE OF SURVEY: _____

INSTRUMENT TYPE: _____

CALIBRATION DUE DATE: _____

SURVEYED BY: _____

TYPE OF SURVEY:

IN USE _____

IN STORAGE _____

COMBINED _____

APPENDIX C

INSTRUCTIONS - NRC FORM 3

Please find enclosed three copies of NRC Form 3, "Notice to Employees", which is required by 10 CFR 19.11(c) and 10 CFR 30.7, 40.7, 50.7 and 70.7 to be posted by each NRC licensee, permittee, and applicant. NRC licensees, permittees, and applicants must have the NRC Form 3 posted in those areas utilized by their employees and contractors and subcontractors.

NRC Form 3 is written in the form of simple questions and answers that paraphrase relevant statutes and regulations. This will help employees of its licensees, permittees, applicants, and of their contractors, subcontractors, and vendors, to clearly understand their responsibilities and rights, and those of the NRC and the Department of Labor, on matters related to public health and safety and employee protection from discrimination.

NRC Form 3 should be posted at locations sufficient to permit employees to observe a copy on the way to or from their place of work. NRC Form 3 must remain posted while the application for a permit or license is pending, during the term of the permit or license, and for 30 days after the termination of the license.

APPENDIX D

PUBLIC LAW 93-438
93rd CONGRESS, H. R. 11510
OCTOBER 11, 1974

AN ACT

To reorganize and consolidate certain functions of the Federal Government in a new Energy Research and Development Administration and in a new Nuclear Regulatory Commission in order to promote more efficient management of such functions.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

SHORT TITLE

Section 1. This Act may be cited as the "Energy Reorganization Act of 1974".

NONCOMPLIANCE

Section 206. (a) Any individual director, or responsible officer of a firm constructing, owning, operating, or supplying the components of any facility or activity which is licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954 as amended, or pursuant to this Act, who obtains information reasonably indicating that such facility or activity or basic components supplied to such facility or activity--

(1) fails to comply with the Atomic Energy Act of 1954 as amended, or any applicable rule, regulation, order, or license of the Commission relating to substantial safety hazards, or

(2) contains a defect which could create a substantial safety hazard, as defined by regulations which the Commission shall promulgate, shall immediately notify the Commission of such failure to comply, or of such defect, unless such person has actual knowledge that the Commission has been adequately informed of such defect or failure to comply.

(b) Any person who knowingly and consciously fails to provide the notice required by subsection (a) of this section shall be subject to a civil penalty in an amount equal to the amount provided by section 234 of the Atomic Energy Act of 1954, as amended.

(c) The requirements of this section shall be prominently posted on the premises of any facility licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended.

(d) The Commission is authorized to conduct such reasonable inspections and other enforcement activities as needed to ensure compliance with the provisions of this section.

APPENDIX E

SPECIAL PACKAGING INSTRUCTIONS
(SPI No. 1G00152)

Refer to packaging portion of the Army Master Data File (AMDF) for specific information about AN/UDM-2 packaging.

By Order of the Secretary of the Army:

JOHN A. WICKHAM JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-36 literature requirements for AN/UDM-2.

* U.S. GOVERNMENT PRINTING OFFICE: 1986- 611-098:20411

APPENDIX C

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

NOTICE TO EMPLOYEES

STANDARDS FOR PROTECTION AGAINST RADIATION (PART 20); NOTICES, INSTRUCTIONS AND REPORTS TO WORKERS; INSPECTIONS (PART 19); EMPLOYEE PROTECTION

The Nuclear Regulatory Commission (NRC) in its Rules and Regulations: Part 20 has established standards for your protection against radiation hazards from radioactive material under license issued by the NRC; Part 19 has established certain provisions for the options of workers engaged in NRC licensed activities; Parts 30, 40, 50, and other parts containing provisions related to employee protection.

POSTING REQUIREMENTS Copies of this notice must be posted in a sufficient number of places in every establishment where activities licensed by the NRC are conducted, to permit employees to observe a copy on the way to or from their place of employment.

YOUR EMPLOYER'S RESPONSIBILITY

Your employer is required to—

1. Apply these NRC regulations and the conditions of his NRC license to all work under the license.
2. Post or otherwise make available to you a copy of the NRC regulations, licenses, and operating procedures which apply to work you are engaged in, and explain their provisions to you.
3. Post Notices of Violation involving radiological working conditions, proposed imposition of civil penalties and orders.
4. Refrain from discriminatory acts against employees who provide information to NRC.

YOUR RESPONSIBILITY AS A WORKER

You should familiarize yourself with those provisions of the NRC regulations, and the operating procedures which apply to the work you are engaged in. You should observe their provisions for your own protection and protection of your co-workers.

WHAT IS COVERED BY THESE NRC REGULATIONS

1. Limits on exposure to radiation and radioactive material in restricted and unrestricted areas;
2. Measures to be taken after accidental exposure;
3. Personnel monitoring, surveys and equipment;
4. Caution signs, labels, and safety interlock equipment;
5. Exposure records and reports;
6. Options for workers regarding NRC inspections;
7. Identifies "protected activities" that employees may engage in;
8. Prohibits discrimination against employees who engage in these protected activities;
9. Identifies the Department of Labor as a source of relief in the event of discrimination; and
10. Related matters.

REPORTS ON YOUR RADIATION EXPOSURE HISTORY

1. The NRC regulations require that your employer give you a written report if you receive an exposure in excess of any applicable limit as set forth in the regulations or in the license. The basic limits for exposure to employees are set forth in Section 20.101; 20.103, and 20.104 of the Part 20 regulations. These Sections specify limits on exposure to radiation and exposure to concentrations of radioactive material in air.
2. If you work where personnel monitoring is required pursuant to Section 20.202;
   (a) your employer must give you a written report of your radiation exposures upon the termination of your employment, if you request it, and
   (b) your employer must advise you annually of your exposure to radiation, if you request it.

INSPECTIONS

All activities under the license are subject to inspection by representatives of the NRC. In addition, any worker or representative of workers who believes that there is a violation of the Atomic Energy Act of 1954, the regulations issued thereunder, or the terms of the employer's license with regard to radiological working conditions in which the worker is engaged, may request an inspection by sending a notice of the alleged violation to the appropriate United States Nuclear Regulatory Commission Regional Office (shown on map below). The request must set forth the specific grounds for the notice, and must be signed by the worker or the representative of the workers. During inspections, NRC inspectors may confer privately with workers, and any worker may bring to the attention of the inspectors any past or present condition which he believes contributed to or caused any violation as described above.

EMPLOYEE PROTECTION

If an employee believes that discrimination has occurred due to engaging in the "protected activities" said employees may, within 30 days of the discriminatory act, file a complaint with the Department of Labor, Employment Standards Administration, Wage and Hour Division. The Department of Labor shall conduct an investigation and shall, where discrimination has occurred, issue an order providing relief to the employee if relief is not provided by other means of settlement.

PROTECTION OF INSPECTORS

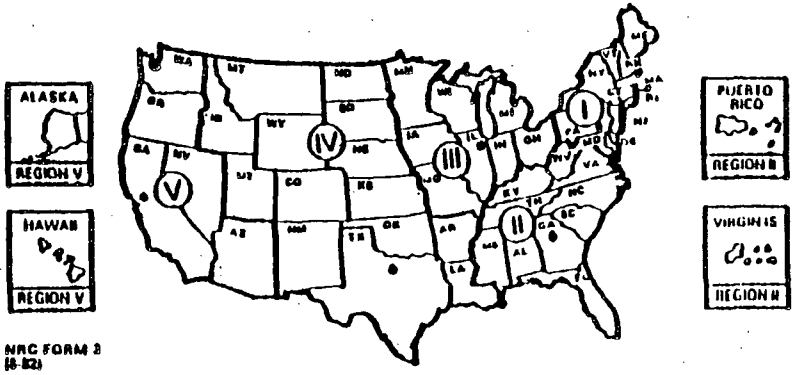
The amended Atomic Energy Act, section 236, provides criminal penalties against any individual who kills, forcibly assaults, resists, opposes, impedes, intimidates or interferes with any person who performs any inspections which (1) are related to any activity or facility licensed by the Commission, and (2) are carried out to satisfy requirements under the Atomic Energy Act or under any other Federal law covering the safety of licensed facilities or the safety of radioactive materials. The acts described above are criminal not only if taken against inspection personnel who are engaged in the performance of such inspection duties, but also if taken against inspection personnel on account of such duties.

SABOTAGE OF NUCLEAR FACILITIES OR FUEL

The amended Atomic Energy Act, section 236, provides criminal penalties against any individual who intentionally and willfully destroys or causes physical damage, or attempts to do so, to any production, utilization, or waste storage facility licensed under the act, or any nuclear fuel or spent fuel regardless of location.

UNITED STATES NUCLEAR REGULATORY COMMISSION REGIONAL OFFICE LOCATIONS

A representative of the Nuclear Regulatory Commission can be contacted at the following addresses and telephone numbers. The Regional Office will accept collect telephone calls from employees who wish to register complaints or concern about radiological working conditions or other matters regarding compliance with Commission rules and regulations.



NRC FORM 3
(8-82)

Regional Offices

REGION	ADDRESS	TELEPHONE
I	U.S. Nuclear Regulatory Commission Region I 631 Park Avenue King of Prussia, PA 19406	215 337-5000
II	U.S. Nuclear Regulatory Commission Region II 101 Marietta St., N.W., Suite 3100 Atlanta, GA 30323	404 221 4503
III	U.S. Nuclear Regulatory Commission Region III 799 Roosevelt Road Glen Ellyn, IL 60137	312 932 2500
IV	U.S. Nuclear Regulatory Commission Region IV 611 Ryan Plaza Drive, Suite 1000 Arlington, TX 76011	817 465 8100
V	U.S. Nuclear Regulatory Commission Region V 1450 Maria Lane, Suite 210 Walnut Creek, CA 94596	415 943 3700

APPENDIX D

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(1) fails to comply with the Atomic Energy Act of 1954 as amended; or any applicable rule, regulation, order, or license of the Commission relating to substantial safety hazards, or

(2) contains a defect which could create a substantial safety hazard, as defined by regulations which the Commission shall promulgate, shall immediately notify the Commission of such failure to comply, or of such defect, unless such person has actual knowledge that the Commission has been adequately informed of such defect or failure to comply.

(b) Any person who knowingly and consciously fails to provide the notice required by subsection (a) of this section shall be subject to a civil penalty in an amount equal to the amount provided by section 234 of the Atomic Energy Act of 1954, as amended.

(c) The requirements of this section shall be prominently posted on the premises of any facility licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended.

(d) The Commission is authorized to conduct such reasonable inspections and other enforcement activities as needed to insure compliance with the provisions of this section.