DEPARTMENT OF THE ARMY
US ARMY CHEMICAL SCHOOL
FORT MC CLELLAN, ALABAMA 36205
(Presently located at APG, MD 21005)

CPT Snyder/ajp/
AUTOVON 584-3392

25 JAN 1980

ATZN-CM-CDT

SUBJECT. Request for TRADOC Approval of Independent Evaluation Plan (IEP) for OT IIA of Radiac Set AN/VDR-1()

Commander
US Army Training and Doctrine Command
ATTN: ATCD-T
Fort Monroe, VA 23651

1. Reference TRADOC Regulation 71-9, User Testing and Evaluation, dated 1 October 1978.

2. The inclosed Independent Evaluation Plan (IEP) is submitted for approval.

3. Annex A to Inclosure 1 is the coordination annex for the IEP.

4. Request HQ, TRADOC use written correspondence to notify the addressees listed below in the "copy furnished" distribution section of the formal approval of the IEP.

5. Point of contact at this HQ is CPT James C. Snyder, AUTOVON 584-3392/3823.

FOR THE COMMANDANT:

Walton A Phillips

WALTON A. PHILLIPS
Colonel, CmlC
Assistant Commandant

1 Incl
as

CF:
Commander, US Army Training and Doctrine Command, ATTN: ATCD-C, ATCD-S, ATCD-AM, ATCD-Z, Ft Monroe, VA 23651
Commander, US Army Operational Test and Evaluation Agency, ATTN: CSTE-PON, 5600 Columbia Pike, Falls Church, VA 22041
Commander, US Army Armor Center and Ft Knox, ATTN: ATZK-CD-TE, Ft Knox, KY 40121
Commander, TRADOC Combined Arms Test Activity, ATTN: ATCAT-OP-P, Ft Hood, TX 76544

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Commander, US Army Combat Developments Experimentation Command, ATTN: ATEC-PPA, Ft Ord, CA 93941
Commander, US Army Combined Arms Center and Fort Leavenworth, ATTN: ATZLCA-DM, Ft Leavenworth, KS 66027
Commander, US Army Logistics Center, ATTN: ATCL-FT, Ft Lee, VA 23801
Commander US Army Administration Center and Ft Benjamin Harrison, ATTN: ATZI-PI, Ft Benjamin Harrison, IN 46216
Commander, US Army Test and Evaluation Command, ATTN: DRSTE-CT-T (Mr. Kadel)/US Army TRADOC LO, Aberdeen Proving Ground, MD 21005
Commander, US Army Military Police School/Training Center & Ft McClellan, ATTN: ATSJ-CD, Ft McClellan, AL 36205
Commander, US Army Signal Center and Ft Gordon, ATTN: ATSN-CD-TE, Ft Gordon, GA 30905
Commander, US Army Nuclear and Chemical Agency, ATTN: MONA-SAL, 7500 Backlick Road, Bldg 2073, Ft Belvoir, VA 22060
Commandant, US Army Infantry School, ATTN: ATSH-CD-MS-C, Ft Benning, GA 31905
Commandant, US Army Field Artillery School, ATTN: ATSF-CD-TE, Ft Sill, OK 73503
Commandant, US Army Quartermaster School, ATTN: ATSM-CD, Ft Lee, VA 23801
Commandant, US Army Transportation School, ATTN: ATSP-CD-TE, Ft Eustis, VA 23604
Director, US Army Materiel Systems Analysis Activity, ATTN: DRXSY-RE, Aberdeen Proving Ground, MD 21005
Director, US Army TRADOC Systems Analysis Activity, ATTN: ATAA-CD, White Sands Missile Range, NM 88002
Director, US Army Combat Surveillance and Target Acquisition Laboratory, ATTN: DELCS-K (Mr. Leonard), Ft Monmouth, NJ 07703
Director, Academy of Health Sciencies, ATTN: HSA-CDM, Ft Sam Houston, TX 78234
Defense Documentation Center, Cameron Station, ATTN: DDC-TCA, Alexandria, VA 22314
President, US Army Armor and Engineer Board, ATTN: ATZK-AE-TA, Ft Knox, KY 40121

(6)

INDEPENDENT EVALUATION PLAN

FOR

RADIAC SET AN/VDR-1()

OPERATIONAL TEST IIA (OT IIA)

(11) FEBRUARY 1980

(12) 25

4/28/80

1.0 SYSTEM DESCRIPTION

1.1 Name of System. Radiac Set AN/VDR-1().

1.2 Background. The AN/VDR-1() is being developed in response to a DA approved Qualitative Materiel Requirement (QMR) dated 3 March 1971. The radiac system must provide a means of conducting both dismounted and vehicular radiological surveys and for performing radiological monitoring of personnel and equipment. The system will replace both the IM-174/PD and IM-174A/PD radiacmeters and may replace the AN/PDR-27() radiac set. This system is not envisioned for use as an aerial survey meter, since the AN/ADR-6 is currently under development for that specific task.

1.3 Characteristics and Configuration. The system will measure gamma radiation dose rates from 0.1 millirad per hour to 1000 rad per hour. The system will have a ratemeter with an internal sensor for performing mounted and dismounted survey and monitoring, and a second sensor with a cable and input connector for monitoring personnel and supplies. Either sensor could be used, depending on the interior dose rates, for obtaining dose rates inside a vehicle. The gamma radiation detection capability of 0.1 millirad per hour to 1000 rad per hour will be divided appropriately between the ratemeter and the plug-in monitoring probe. A presettable, audible and visual warning device will be integral to the ratemeter. Overall system error for measuring gamma radiation will not exceed ± 20 percent.

1.4 Concept of Employment. The system will be operated by the individual soldier. A driver should be able to operate it during vehicular radiological surveys. The system will be a TOE issue item to Army units. The equipment will not normally be pooled at higher echelons, except as maintenance floats. The basis of issue will be one system per platoon, company headquarters and subunit requiring a capability to detect low or high level contamination (e.g., medical section). The system will be operated in various climatic and weather conditions. The system will provide the commander with data concerning gamma dose rates in areas contaminated by fallout, neutron-induced gamma activity or radiological agents. This data will assist the planning of tactical operations and medical monitoring of ogical casualties.

1.5 Test Manager. James C. Snyder, CPT, US Army Chemical School (USACMLS), Test and Evaluation Coordination Office (ATTN: ATZN-CM-CDT).

2.0 ISSUES AND ASSOCIATED CRITERIA

2.1 MISSION PERFORMANCE

*2.1.1 ISSUE: Is the system capable of being operated by the individual soldier?

2.1.1.1 SCOPE: Testing will assess the operator's ability to read the meter while performing radiological survey and monitoring in a realistic operational environment. A baseline comparison against both the IM-174A/PD and AN/PDR-27() should be made.

2.1.1.2 CRITERIA: Ease of operation includes manipulation of all controls and associated accessories, removal from packing, preoperational tests, user operator tests and maintenance tests.

2.1.1.2.1 The system shall be easier to operate and be maintained by the individual soldier in normal combat clothing than both the IM-174A/PD and AN/PDR-27().

2.1.1.2.2 The system shall be easier to operate and be maintained by the individual soldier while in full chemical protective clothing, gloves and mask than both the IM-174A/PD and AN/PDR-27().

2.1.1.2.3 The design of the system shall facilitate a simple check of the workability (go-no go) of the equipment.

2.1.1.3 RATIONALE: Military items must be operated and maintained by soldiers under both normal combat and NBC warfare conditions.

2.1.1.4 SOURCE: QMR, para 3a, 9f, 10a and 10b.

*2.1.2 ISSUE: Are the dials and controls located on the ratemeter so as to be easily reached and used?

2.1.2.1 SCOPE: Testing will assess whether or not test soldiers can manipulate the controls under tactical conditions while both normally clothed and in chemical protective clothing, mask and gloves.

2.1.2.2 CRITERIA:

2.1.2.2.1 Dials and controls shall be integral with the ratemeter.

2.1.2.2.2 Dials and controls shall be easy to reach and use.

2.1.2.2.3 Dials and controls shall be of a location, size, shape, and arrangement to allow use with chemical protective clothing, mask and gloves.

2.1.2.3 RATIONALE: Soldiers must be able to manipulate the controls while both in and out of chemical protective clothing, mask and gloves to survive in a combat environment.

* Critical issues

2.1.2.4 SOURCE: QMR, para 8b(3).

*2.1.3 ISSUE: Can the system be carried?

2.1.3.1 SCOPE: The system shall be assessed as to whether or not means for it to be carried are provided as well as their adequacy while the test subjects are wearing and not wearing chemical protective clothing and gloves.

2.1.3.2 CRITERION: The system shall have straps, handles, cases or other attachments if necessary which can be easily used by soldiers who are both wearing and not wearing chemical protective overgarments and gloves.

2.1.3.3 RATIONALE: In addition to being mounted in vehicles, the system is also supposed to be carried and operated by one individual.

2.1.3.4 SOURCE: QMR, para 8c, 10a and 10b.

*2.1.4 ISSUE: Is the data display easy to read?

2.1.4.1 SCOPE: Testing will assess whether or not the data display can be read by operator personnel under combat conditions.

2.1.4.2 CRITERIA:

2.1.4.2.1 The meter shall be direct reading. Calibration curves will not be used.

2.1.4.2.2 The numbers and division must be large enough to be read by the operators.

2.1.4.2.3 The indicating meter shall be located for easy observation of readings when mounted and dismounted.

2.1.4.2.4 The scale, which shall be lighted or luminous, shall permit reading during darkness and under blackout conditions without violating OPSEC principles.

2.1.4.3 RATIONALE: Reading of a meter should be as easy and simple as possible under tactical conditions, without violating OPSEC principles.

2.1.4.4 SOURCE: QMR, para 7b(5) and 10d.

*2.1.5 ISSUE: Is the vehicle driver able to operate the VDR-1 when it is mounted in the vehicle?

2.1.5.1 SCOPE: Testing will assess whether the mounting location is compatible with the driver in terms of his:

2.1.5.1.1 Simultaneously driving and operating the system during vehicular radiological surveys.

2.1.5.1.2 Proximity while seated in terms of a human factor assessment of his ability to reach the system and manipulate its controls.

2.1.5.2 CRITERIA:

2.1.5.2.1 The system must be mounted such that the driver can manipulate the controls from his seat without unnatural twisting, turning, bending or reaching while driving.

2.1.5.2.2 The systems must be mounted such that the driver can read the meter during radiological surveys.

2.1.5.3 RATIONALE: If the vehicle driver must conduct the radiological survey alone, he will have to operate both his vehicle and the VDR-1 from his seat.

2.1.5.4 SOURCE: QMR, para 3a.

*2.1.6 ISSUE: Are the operations of the system and the mounting locations selected so as to be compatible with crew duties and vehicle operation?

2.1.6.1 SCOPE: Testing will assess the compatibility of the operation of the system with its location in the vehicle and the work environment surrounding the system. Testing will be conducted in the M113, M60A1/A3, M151A2, M577, XM1, XM2, M880.

2.1.6.2 CRITERIA:

2.1.6.2.1 The system shall be mounted in a manner to preclude interference with the normal duties of the driver, assistant driver, and/or vehicle commander.

2.1.6.2.2 The system shall be mounted in a manner to preclude interference with the operation of vehicular mounted weapons.

2.1.6.2.3 The system shall not be mounted in locations which consume cargo and/or troop seating space.

2.1.6.2.4 The system's alarm shall operate in a manner to offer complete compatibility with systems in the vehicle.

2.1.6.3 RATIONALE: The system must be designed so as not to interfere with other critical operations inside the vehicle.

2.1.6.4 SOURCE: QMR, para 8b(9) and 8b(10); USAOCCS IER, Aug 78, page B-2, item 7.

*2.1.7 ISSUE: Is adequate mounting hardware provided?

2.1.7.1 SCOPE: Mounting hardward will be verified as fitting the following vehicles: M113, M60A1/A3, M151A2, M577, XM1, XM2, and M880.

2.1.7.2 CRITERIA:

2.1.7.2.1 Mounting hardward shall be provided for mounting the ratemeter in tactical vehicles.

2.1.7.2.2 The number of different mounting hardware items used in different types of vehicles shall be the minimum possible, eg., the ideal is for a universal mount for all vehicles.

2.1.7.3 RATIONALE: Mounting prevents abuse during vehicular surveys and other transportation. Also, the driver can be the operator if the system is mounted in the vehic'e.

2.1.7.4 SOURCE: QMR, para 8b(6).

*2.1.8 ISSUE: Does the mounting system facilitate mounting and dismounting of the system?

2.1.8.1 SCOPE: Testing will measure the length of time to mount (also to remove) the system from its mounting brackets when operator is in normal combat clothing as well as in full chemical protective clothing.

2.1.8.2 CRITERION: The system shall be capable of being easily mounted onto or disconnected from the mounting brackets in tactical vehicles within:

2.1.8.2.1 One minute by personnel in normal combat clothing.

2.1.8.2.2 Three minutes by personnel in full Mission Oriented Protective Posture (MOPP level 4).

2.1.8.3 RATIONALE: Installation and removal of the system from vehicles should not be time consuming or difficult to prevent degradation of the mission.

2.1.8.4 SOURCE: QMR, para 8b(7). JWG meeting of 18 Jun 79; CSTA Lab FONECON of 26 Nov 79.

*2.1.9 ISSUE: Does the system have a self-contained power source which is not excessively drawn upon during usage?

2.1.9.1 SCOPE: Testing shall determine the actual power drain on the internal power source caused by operation of the system.

2.1.9.2 CRITERION: The power drain of the system shall not exceed one watt when the system is operated from its own internal power source.

2.1.9.3 RATIONALE: The smaller the power drain on the internal power source, the longer the power reserve will function.

2.1.9.4 SOURCE: QMR, para 8b(2).

*2.1.10 ISSUE: Does the system create an unacceptable power drain upon the vehicular power supply?

2.1.10.1 SCOPE: Testing will determine the actual power drain when the system is operated in its vehicular mounted mode. The vehicles will also be operated, to include organic radios being operated, while the installed VDR-1 is concurrently operated.

2.1.10.2 CRITERIA:

2.1.10.2.1 The power drain of the system shall not exceed five watts when the system is operated from a vehicle's standard 24 volt electrical supply.

2.1.10.2.2 The vehicle, its radio(s) and other standard electrical systems, shall function properly while the VDR-1 is being concurrently operated.

2.1.10.3 RATIONALE: The power drain on the vehicle caused by the VDR-1 must not interfere with vehicular functions.

2.1.10.4 SOURCE: QMR, para 8b(2); JWG meeting of 18 Jun 79, MIL-2-49356.

*2.1.11 ISSUE: Is accuracy affected by variations in power supply output?

2.1.11.1 SCOPE: Testing will assess whether or not power supply variations affect the accuracy of the system.

2.1.11.2 CRITERION: Variations in power supply output shall not cause the system to operate outside of accuracy specifications (see paragraph 2.1.23.2.3).

2.1.11.3 RATIONALE: Variations in power supply which provide false radiation readings can unnecessarily cause radiation casualties.

2.1.11.4 SOURCE: QMR, para 7b(9).

*2.1.12 ISSUE: Does the system meet the maximum weight restrictions?

2.1.12.1 SCOPE: Testing will determine the weight of system as specified in the follow'ng criteria.

2.1.12.2 CRITERIA:

2.1.12.2.1 The ratemeter, including batteries, but less the ancillary equipment, shall be a single, self-contained unit, which does not exceed 5.25 pounds in weight.

2.1.12.2.2 Plug-in probe must not exceed two pounds.

2.1.12.2.3 Vehicle installation accessories, consisting of power adapter mounting brackets, cable assemblies and correlation plate shall not exceed five pounts.

2.1.12.3 RATIONALE: The system must be light enough not to be a burden to the user or his vehicle.

2.1.12.4 SOURCE: QMR, para 8a; JWG meeting of 18 Jun 79; MIL-R-49356.

*2.1.13 ISSUE: Does the system conform to the maximum allowable dimensions?

2.1.13.1 SCOPE: Te · shall measure the actual dimensions of the system.

2.1.13.2 CRITERIA:

2.1.13.2.1 The ratemeter shall not exceed these dimensions: 8.5" long by 4.5" wide by 3.5" high.

2.1.13.2.2 The plug-in probe shall not exceed these dimensions: 8.75" long by 1.75" diameter.

2.1.13.3 RATIONALE: The system must be small enough so as not to take up space needed for cargo and passengers in vehicles and also be easily handled when carried and operated by the individual soldier.

2.1.13.4 SOURCE: QMR, para 8b(1).

*2.1.14 ISSUE: Does the system have an adequate warning device?

2.1.14.1 SCOPE: Testing will assess the adequacy and operational environmental impact of the alarm system associated with the system.

2.1.14.2 CRITERIA:

2.1.14.2.1 The warning device must be:

2.1.14.2.1.1 Presettable from 100 millirad/hour to 100 rad/hour in increments of 100 millirad/hour in the range from 100 millirad/hour to 1 rad/hour and increments of 10 rad/hour in the range from 1 rad/hour to 100 rad/hour.

2.1.14.2.1.2 Audible.

2.1.14.2.1.3 Visual.

2.1.14.2.1.4 Integral to the ratemeter.

2.1.14.2.2 The visual and audible alarms should each be independently controlled.

2.1.14.2.3 The audible alarm should not disrupt two-way radio communications.

2.1.14.2.4 The visual alarm should be capable of being dimmed or extinguished.

2.1.14.2.5 When the alarm is preset to a particular dose rate, the alarm shall trigger when the actual reading is within $\pm$ 20% of the preset value.

2.1.14.2.6 The activated, but untriggered, alarm shall not cause an appreciable drain on the power source.

2.1.14.2.7 The audible and visual alarms must be effective in gaining the attention of the operator.

2.1.14.3 RATIONALE: A warning device serves to expand the role of the system from merely a ratemeter to an alarm. However, the light and noise from the alarm must coincide with acceptable OPSEC procedures. An alarm that does not interfere with radio transmission and reception is an aid, not a hinderance.

2.1.14.4 SOURCE: QMR, para 1b and 10e; USACCCS IER, Aug 78, para 2-3g(3)(h).

*2.1.15 ISSUE: Is the system capable of the modes of operation prescribed by FM 3-12 and local SOPs?

2.1.15.1 SCOPE: Testing will assess the system's ability to perform both continuous and intermittent monitoring and determine the length of time to perform pre-operational checks.

2.1.15.2 CRITERIA:

2.1.15.2.1 The system shall be capable of continuous and intermittent operation.

2.1.15.2.2 The pre-operational checks, to include warm-up time, shall not exceed five minutes under temperature ranges indicative of climatic categories 1,4,6 and 7.

2.1.15.3 RATIONALE: FM 3-12 and many local SOPs require both continuous and intermittent monitoring.

2.1.15.4 SOURCE: QMR, para 2b and 7b(6).

*2.1.16 ISSUE: Can the ratemeter respond to either the internal detector or external probe without disconnecting the probe?

2.1.16.1 SCOPE: Testing will determine whether or not the system can respond to either the internal detector or external probe without disconnecting the probe.

2.1.16.2 CRITERION: A manual switching control shall be provided to enable the ratemeter to respond to either the internal detector or the external personnel monitoring probe without physically disconnecting the monitoring probe.

2.1.16.3 RATIONALE: Operations is facilitated by not having to remove the probe to use the internal detector.

2.1.16.4 SOURCE: QMR, para 8b(4).

*2.1.17 ISSUE: Can the system respond rapidly to changes in radiation doserates?

2.1.17.1 SCOPE: Testing will determine how quickly the system responds to within 10% of its final reading.

2.1.17.2 CRITERIA:

2.1.17.2.1 The ratemeter shall respond to within 10% of its final reading within two seconds when it is exposed to sudden changes in radiation dose rate.

2.1.17.2.2 The plug-in monitoring probe shall respond to within 10% of its final reading within six seconds when it is exposed to sudden changes in radiation dose rate.

2.1.17.3 RATIONALE: For ease of operational usage, as rapid as possible a response is needed.

2.1.17.4 SOURCE: QMR, para 7b(7).

*2.1.18 ISSUE: Is an external sensing element provided and can it be easily manipulated?

2.1.18.1 SCOPE: Testing will determine the existance of the external sensing element. Testing will assess the ability of test soldier operators to manipulate the system during personnel monitoring under field conditions.

2.1.18.2 CRITERIA:

2.1.18.2.1 An ancillary external sensing element for personnel monitoring, capable of connection to the ratemeter, shall be provided.

2.1.18.2.2 The external sensing element shall be easily handled and manipulated close to the subject being monitored without undue strain on the electrical cord.

2.1.18.3 RATIONALE: The conduct of personnel monitoring requires a small, easily manipulated probe be used, rather than a large bulky instrument.

2.1.18.4 SOURCE: QMR, para 8b(5).

*2.1.19 ISSUE: Is the system operational with only a minimum warm-up time for the equipment?

2.1.19.1 SCOPE: The system shall be turned on after periods of inactivity, and a determination made of how soon required accuracy is achieved under various temperatures.

2.1.19.2 CRITERION: The system shall operate with the required accuracy within two minutes after being turned on following a period of inactivity of at least 60 minutes under temperature ranges indicative of climatic categories 1,4,6 and 7.

2.1.19.3 RATIONALE: Periodic monitoring with the VDR-1 will take less time if the warm-up time is minimal.

2.1.19.4 SOURCE: QMR, para 7b(6).

*2.1.20 ISSUE: Can the system be calibrated with the existing field radiac calibrator?

2.1.20.1 SCOPE: Testing will determine whether or not the system can be accurately calibrated in a field radiac calibrator.

2.1.20.2 CRITERIA:

2.1.20.2.1 Calibration of the system shall be accomplished by the TS-784 ()/PD field radiac calibrator or by its replacement.

2.1.20.2.2 After calibration, the system shall meet the accuracy criteria listed in paragraph 2.1.23.2.3.

2.1.20.3 RATIONALE: The system has to be calibrated using a source readily available in the field.

2.1.20.4 SOURCE: QMR, para 7c.

2.1.21 ISSUE: Are attenuation factors provided, and are they adequate, for the determination of radiation levels exterior to the vehicle in which the VDR-1 is mounted?

2.1.21.1 SCOPE: Testing will assess the validity of the attenuation factors provided for each vehicle intended for use as a carrier (M113, M60A1/A3, M151A2, M577, XM1, XM2 and M880).

2.1.21.2 CRITERION: When the standardized attenuation factor is applied to the instrument reading, the result will be within ± 20% of true dose at the 95% confidence level of the actual exterior reading.

2.1.21.3 RATIONALE: Attenuation is a function of the location of the instrument within the vehicle. In order to determine the exterior contamination level, a standard factor must be developed for each vehicle and each mounting location in each vehicle.

2.1.21.4 SOURCE: Academy of Health Sciences letter of 2 Aug 79; USACMLS MSD-RAD; QMR, para 1b.

*2.1.22 ISSUE: Is the information plate present and adequate?

2.1.22.1 SCOPE: Operator test soldiers will assess whether or not they can read and understand the plates, to include when the system is mounted in vehicles. Testing will assess how well the plates remain attached and readable after field usage of mounting/dismounting, operation, cleaning and decontaminating.

2.1.22.2 CRITERIA:

2.1.22.2.1 The item may be a card or a plate.

2.1.22.2.2 The plate shall be waterproof.

2.1.22.2.3 The plate shall list the radiacmeter mounting location correlation factor for the tactical vehicle for which each specific installation kit was developed.

2.1.22.2.4 The plate shall be semi-permanently affixed to the ratemeter or the mount.

2.1.22.2.5 The plate shall be clearly visible when the system is used in a vehicular survey mode.

2.1.22.2.6 The plate shall be capable of replacement at organizational level.

2.1.22.3 RATIONALE: Operators must know where the system can be mounted in their vehicle and what the attenuation factors are. Therefore, the plate bearing that information must be visible and readable.

2.1.22.4 SOURCE: QMR, para 8b(8).

*2.1.23 ISSUE: Does the system have an adequate range for accuracy radiation measurement?

2.1.23.1 SCOPE: Testing will measure the range of the system; will determine the accuracy of the system, and determine the system's ability to detect beta radiation.

2.1.23.2 CRITERIA:

2.1.23.2.1 Lower range must be one-tenth millirad/hour or less.

2.1.23.2.2 Upper range must be 1000 rad/hour or greater.

2.1.23.2.3 Overall system error for measuring gamma and X-ray radiation shall not exceed $\pm$ 20% of the true dose at that location. This overall system error includes those errors arising from temperature, energy and directional dependencies. Tapping or vibration (in excess of normal vehicular vibrations) shall not be permitted in meeting criterion.

2.1.23.2.4 The system shall detect surface beta radiation in the presence of a gamma radiation field of 100 millirad/hour or less as stipulated in MIL-R-49356(ER).

2.1.23.3 RATIONALE: The VDR-1 must be at least comparable to the systems it is to replace (IM-174/PD, IM-174A/PD, and AN/PDR-27( )).

2.1.23.4 SOURCE: QMR, para 1b; MIL-R-49356(ER); USAOCCS IER, Aug 78.

*2.1.24 ISSUE: Is the gamma and X-ray radiation detection capability appropriately divided between the sensor internal to the ratemeter and the sensor in the monitoring probe?

2.1.24.1 SCOPE: Testing will determine the actual range over which the system measures gamma and X-ray radiation using the probe and the ratemeter individually.

2.1.24.2 CRITERION: The coverage ranges should be one-tenth millirad/hour to 100 millirad/hour for the monitoring probe and 100 millirad/hour to 1000 rad/hour for the ratemeter.

2.1.24.3 RATIONALE: Lower dose-rates are important when monitoring personnel and food. A probe is easier to manipulate in these cases. For area surveying, an integral ratemeter is easier to use.

2.1.24.4 SOURCE: QMR, para 1b.

2.2 LOGISTICS

*2.2.1 ISSUE: Is the time required for servicing the system within the required specifications?

2.2.1.1 SCOPE: Testing will determine the length of time required to perform servicing or checking out of the system under both field and maintenance shop conditions.

2.2.1.2 CRITERION: Assuming no repairs are required the time necessary to service or check out the system (including warm up time) IAW applicable draft equipment publications procedures under both field and maintenance shop conditions shall not exceed five minutes.

2.2.1.3 RATIONALE: Servicing time should be as minimal as possible to reduce the burden on the unit's operation.

2.2.1.4 SOURCE: QMR, para 2b.

*2.2.2 ISSUE: Can preventive and in-storage maintenance be performed quickly by appropriate personnel?

2.2.2.1 SCOPE: Preventive and in-storage maintenance will be performed by 35B MOS test soldiers and user soldiers under appropriate field and depot conditions and assessed for ease and length of time.

2.2.2.2 CRITERION: Preventive and in-storage maintenance shall each be performed in ten minutes or less at the 99% confidence level by appropriate user personnel.

2.2.2.3 RATIONALE: The maintenance burden should be as small as possible.

2.2.2.4 SOURCE: QMR, para 9c.

*2.2.3 ISSUE: Is the system designed to facilitate GS level maintenance?

2.2.3.1 SCOPE: Maintenance test soldiers will evaluate the construction of the system in terms of standardization of components, interchangeability of components, and accessibility to inspection/servicing.

2.2.3.2 CRITERIA:

2.2.3.2.1 Standard components shall be used.

2.2.3.2.2 Maximum interchangeability of components shall be provided.

2.2.3.2.3 (Desirable) Modular construction shall be employed to facilitate repair by replacement.

2.2.3.2.4 All maintenance points, inspection points and service accessories must be accessible for maintenance personnel.

2.2.3.3 RATIONALE: The maintenance burden should be small as possible.

2.2.3.4 SOURCE: QMR, para 9d.

*2.2.4 ISSUE: Does the system maintain the required accuracy during normal use?

2.2.4.1 SCOPE: Testing will assess whether the calibration period specified in the draft equipment publications is adequate.

2.2.4.2 CRITERION: The system shall maintain its required accuracy (see paragraph 2.1.23.2.3) during normal use for at least six months without recalibration.

2.2.4.3 RATIONALE: The longer the time between calibrations, the less the burden on the logistics system, and therefore the longer the item is available for operational usage.

2.2.4.4 SOURCE: QMR, para 7d.

*2.2.5 ISSUE: Are the draft equipment publications contained in the maintenance test support package complete, easy-to-read, consistent in nomenclature, simple to follow and adequate enough to complete both scheduled and unscheduled maintenance operations and parts acquisition at all levels of maintenance?

2.2.5.1 SCOPE: The draft equipment publications will be examined from both the user and maintainer points of view to determine their adequacy.

2.2.5.2 CRITERIA: The draft equipment publications must be:

2.2.5.2.1 Complete. All necessary information must be included.

2.2.5.2.2 Easy to read. No confusing terminology must be used.

2.2.5.2.3 Consistent in nomenclature.

2.2.5.2.4 Simple to follow.

2.2.5.2.5 Sufficiently adequate to complete all necessary maintenance functions.

2.2.5.3 RATIONALE: Draft equipment publications must be of use to users and maintainers.

2.2.5.4 SOURCE: TRADOC Reg 71-9

*2.2.6 ISSUE: Can the representative soldier perform critical maintenance tasks to the prescribed standard?

2.2.6.1 SCOPE: The proposed maintenance training system elements and procedures developed by TRADOC Logistics oriented school(s) will be analyzed during pretest training by evaluating test players' performance prior to training, after training, and during the conduct of the test. In this manner, training transfer/effectiveness and applicability of required critical tasks in the unit and institutional environments will be assessed. Requirements of the proposed training system in terms of time (to include extra time required for players to achieve desired performance levels), personnel, media, and other assets will be recorded for COEA/CTEA purposes.

2.2.6.2 CRITERION: After test players have received training, as outlined in the Individual and Collective Training Plan (ICTP), all of the test players will be able to perform all of those critical tasks to the prescribed standard without increasing training time, instructors or training material compared to training on the AN/PDR-27() and IM-174A/PD.

2.2.6.3 RATIONALE: The AN/VDR-1 should require no additional maintenance training than that required by the systems it is to replace.

2.2.6.4 SOURCE: TRADOC Reg 71-9.

*2.2.7 ISSUE: Are the identification markings of all replaceable components and assemblies adequate?

2.2.7.1 SCOPE: Testing will assess whether or not all replaceable components and assemblies are marked so as to be readily identifiable to the operator and maintenance personnel and will not be obliterated by repainting or abrasion during field use.

2.2.7.2 CRITERIA:

2.2.7.2.1 All components and assemblies shall be marked so as to be readily identifiable to operators and maintainers.

2.2.7.2.2 Instructions applied to the equipment shall be attached such that they are not subject to obliteration by repainting of the equipment or by abrasion resulting from field use.

2.2.7.3 RATIONALE: Labeling, which is an appropriate and necessary means for aiding in the operation and maintenance of the system, should be visible and not subject to obliteration due to field use.

2.2.7.4 SOURCE: QMR, para 9e; JWG meeting of 18 Jun 79.

2.3 RAM-D

*2.3.1 ISSUE: Are a sufficient number of the systems expected to be intrinsically available for combat service at any one time?

2.3.1.1 SCOPE: Testing will determine the number of systems available at any given time (while not in storage) during the test.

2.3.1.2 CRITERION: At least 95% of the systems which are in use (not storage) shall be suitable for combat service at any given time.

2.3.1.3 RATIONALE: As many systems as possible should be functional at any given time to minimize the system's effects on the logistics system.

2.3.1.4 SOURCE: QMR, para 7e.

*2.3.2 ISSUE: Are a sufficient number of the systems expected to function properly after storage?

2.3.2.1 SCOPE: Testing will determine the number of systems which will function after undergoing appropriate accelerated storage.

2.3.2.2 CRITERION: At least 85% of the systems shall function properly after a period of storage of at least three years under the conditions of storage listed in paragraph 2.5.1.2.

2.3.2.3 RATIONALE: As small a number of systems as possible should fail after storage so as to be the least possible burden on the logistical system.

2.3.2.4 SOURCE: QMR, para 7f.

*2.3.3 ISSUE: Can the system at least meet the approved MTBF, MAV, BOC and MTTR?

2.3.3.1 SCOPE: Testing will determine the MTBF, MAV, BOC, and MTTR.

2.3.3.2 CRITERIA:

2.3.3.2.1 The MTBF shall be no less than 400 operating hours.

2.3.3.2.2 The MAV shall be no less than 400 operating hours.

2.3.3.2.3 The BOC shall be no less than 800 operating hours.

2.3.3.2.4 The MTTR shall not exceed ten minutes.

2.3.3.2.5 The system reliability associated with the four criteria above shall be at least 95%.

2.3.3.3 RATIONALE: The MTBF, MAV, BOC and MTTR must be sufficient so as not to render the system an excessive burden to the supply and maintenance systems.

2.3.3.4 SOURCE: QMR, para 9a; JWG meeting of 18 Jun 79; MSD-RAD, USACMLS.

2.4 SURVIVABILITY/VULNERABILITY

*2.4.1 ISSUE: Can the system survive nuclear effects?

2.4.1.1 SCOPE: Testing will assess the inherent ability of the system to withstand the nuclear effects of air blast, thermal radiation, initial nuclear radiation and electromagnetic pulse. Testing will be conducted during developmental testing.

2.4.1.2 CRITERION: The system shall withstand the nuclear effects as stipulated in MIL-N-49357(N) for Radiac Set AN/VDR-1 not reproduced here due to security classification.

2.4.1.3 RATIONALE: Military tactical equipment must withstand nuclear effects.

2.4.1.4 SOURCE: QMR, para 8f.

*2.4.2 ISSUE: Can the system be decontaminated?

2.4.2.1 SCOPE: Testing will assess the impact on the function of the system after undergoing decontamination by soap and water, then DS-2. Testing will assess the design of the system for contributions to minimization of NBC contamination.

2.4.2.2 CRITERIA:

2.4.2.2.1 The system shall be designed so as to minimize contamination by chemical and biological agents and radiological materials.

2.4.2.2.2 Components of the system shall be readily capable of decontamination with minimum effect on their proper operation.

2.4.2.2.3 The draft equipment publications shall describe procedures to adequately decontaminate the system.

2.4.2.3 RATIONALE: Equipment must operate in an NBC environment, part of which is the post-decontamination environment.

2.4.2.4 SOURCE: QMR, para 8f.

2.5 ENVIRONMENTAL

*2.5.1 ISSUE: Is the system capable of operation with the required accuracy under various climatic conditions?

2.5.1.1 SCOPE: Testing will assess the equipment's ability to operate during and after exposure to various climatic categories.

2.5.1.2 CRITERION: The system must be capable of being tactically operated with the required accuracy of $\pm$ 20%, stored and transported during and after exposure to climatic categories 1,4,6,7 (and 8 desired) as defined in AR 70-38.

2.5.1.3 RATIONALE: Military tactical equipment must be capable of operating under a wide range of climatic conditions.

2.5.1.4 SOURCE: QMR, para 2a and 7a (1); JWG meeting of 18 Jun 79; AR 70-38.

*2.5.2 ISSUE: Does the system prevent fungal growth?

2.5.2.1 SCOPE: Testing will assess the ability of the system to prevent fungal growth.

2.5.2.2 CRITERION: External and internal parts shall not support fungal growth as encountered world wide.

2.5.2.3 RATIONALE: Fungal growth can render military equipment inoperative unless the system is designed to retard/prevent its growth.

2.5.2.4 SOURCE: QMR, para 7a(3); MIL-R-49356(ER); MIL-STD-454, requirement 4.

*2.5.3 ISSUE: Can the system function after submersion in water?

2.5.3.1 SCOPE: Testing will assess the water tightness of the system during complete submersion.

2.5.3.2 CRITERIA: The system shall operate within the prescribed degree of accuracy of ± 20% after complete and continuous submersion in fresh water for a period of:

2.5.3.2.1 30 minutes. (QMR)

2.5.3.2.2 2 hours (MIL-STD-810)

2.5.3.3 RATIONALE: Military equipment is often subjected to short periods of submersion and rain.

2.5.3.4 SOURCE: QMR, para 7a(3), MIL-R-49356(ER), MIL-STD-810, JWG meeting of 18 Jun 79.

*2.5.4 ISSUE: Can the system withstand a salt atmosphere?

2.5.4.1 SCOPE: Testing will assess the ability of the system to be operated during and after exposure to a salt atmosphere.

2.5.4.2 CRITERIA:

2.5.4.2.1 The system shall be capable of withstanding, without damage, normal ocean beach atmospheric corrosion for one year.

2.5.4.2.2 The system shall operate within specifications during exposure to a normal ocean beach atmosphere for 30 days without cleaning except for the external surfaces and contact points which will be cleaned every 48 hours.

2.5.4.2.3 The system shall operate after being cleaned IAW Draft Equipment Manuals (Operator Level) following exposure to a normal ocean beach atmosphere for 48 hours.

2.5.4.3 RATIONALE: Military equipment must function after exposure to a salt environment for extended periods of time.

2.5.4.4 SOURCE: QMR, para 7a(2); JWG Meeting of 18 Jun 79; FONECON with Mr. Leonard (CSTA Lab) on 14 Jan 80.

2.6 DEPLOYABILITY

*2.6.1 ISSUE: Can the system adequately withstand vibration and shocks?

2.6.1.1 SCOPE: Testing will assess the ability of the system to withstand vibration and shocks while being transported in the appropriate operational mode in vehicles, aircraft, vessels, and also when air dropped.

2.6.1.2 CRITERIA:

2.6.1.2.1 The system shall be constructed to operate within required specifications after transport under combat conditions in tactical vehicles over rough terrain and in aircraft and vessels, as well as after shocks incurred when dropped in its combat transportation mode.

2.6.1.2.2 The system shall withstand shocks and vibrations coincident with soldier handling under simulated combat conditions, and still function within required specifications.

2.6.1.3 RATIONALE: The system must remain operational under the rigors of combat transportation and usage.

2.6.1.4 SOURCE: QMR, para 8d; MIL-STD-810; MIL-S-901.

2.7 PERSONNEL SELECTION

*2.7.1 ISSUE: Can the system be maintained by properly trained 35B MOS personnel?

2.7.1.1 SCOPE: Testing will verify that properly trained 35B MOS personnel can perform prescribed maintenance on the VDR-1, and will assess the validity of the training concept for maintenance personnel.

2.7.1.2 CRITERIA:

2.7.1.2.1 The AN/VDR-1 will be repairable/maintainable IAW draft equipment publications by properly trained 35B MOS personnel.

2.7.1.2.2 The training concept for the maintenance personnel will be adequate to allow maintainers to perform their mission.

2.7.1.3 RATIONALE: 35B personnel have been designated as the appropriate maintenance personnel for this system. As such, they must be capable of performing that prescribed maintenance.

2.7.1.4 SOURCE: Combat and Training Developer Test Support Package, date 10 Nov 75.

2.8 PUBLICATIONS

*2.8.1 ISSUE: Do the draft equipment publications conform in content and format to required specifications?

2.8.1.1 SCOPE: The draft equipment publications will be compared with the requirements outlined in AR 310-3, MIL-M-38784(A) and MIL-M-6300 (TM) series, as applicable.

2.8.1.2 CRITERION: The draft equipment publications will meet the requirements of AR 310-3, MIL-M-38784(A) and MIL-M-6300(TM) series, as applicable.

2.8.1.3 RATIONALE: Military equipment publications must be properly formatted.

2.8.1.4 SOURCE: AR 310-3.

2.9 SAFETY

*2.9.1 ISSUE: Is the system safe to both operate and maintain?

2.9.1.1 SCOPE: Testing will assess whether or not the system is free of operational and maintenance hazards.

2.9.1.2 CRITERIA:

2.9.1.2.1 The system will be free of safety hazards from noise and noxious gases.

2.9.1.2.2 Operating personnel shall be adequately protected against high voltage.

2.9.1.3 RATIONALE: Military equipment should be as safe to operate and maintain as possible.

2.9.1.4 SOURCE: QMR, para 8e and 10c.

2.10 TRAINING

*2.10.1 ISSUE: Can the representative soldier perform the critical operational and tactical tasks with appropriate skills, knowledge, motivation, and appreciation of the system's capabilities and limitations to the prescribed standard?

2.10.1.1 SCOPE: The proposed tactical training system elements and procedures developed by TRADOC proponent school will be analyzed during pretest training by evaluating test players' performance prior to training transfer/effectiveness and applicability of required critical tasks in both unit and institutional environments will be assessed. Requirements of the proposed training system in terms of time (to include extra time required for players to achieve desired performance levels), personnel, media, and other assets will be recorded for COEA/CTEA purposes. The tactics employed by the test players should be observed to ascertain that they are employing equipment correctly and not degrading the capability of the equipment. This is measured and compared to the ARTEP/revised ARTEP standards.

2.10.1.2 CRITERIA:

2.10.1.2.1 Upon completion of tactical training, as outlined in the ICTP, all of the test players will be able to perform all of the operational/tactical tasks to standards identified in either SQT type test or ARTEP without increasing training time, instructors or training material compared to training on the IM-174A/PD and AN/PDR-27() combined.

2.10.1.2.2 Upon completion of training, test players will operate the AN/VDR-1 to 100 percent of the designed equipment capability.

2.10.1.3 RATIONALE: The AN/VDR-1 should not require unacceptable increases in training requirements over the two systems it is to replace.

2.10.1.4 SOURCE: TRADOC Reg 71-9.

3.0 CONCEPT OF EVALUATION

3.1 EVALUATION PROCEDURES

3.1.1 INDEPENDENT AND DEPENDENT VARIABLES

The only criteria which have independent variables are as follows:

(1) Para 2.1.11.2. Vehicular power supply output should be varied at intervals of one volt beginning at 15 volts and ending at 24 volts.

(2) Para 2.1.15.2.2. The preoperational checks, to include warm up time, shall be conducted within the temperature ranges specified in

AR 70-38 for climatic conditions 1,4,6 and 7, to determine if differences occur. Warm up time is probably the segment of time to be affected.

(3) Para 2.1.17.2.1 and 2.1.17.2.2. Testing shall be conducted within temperature conditions specified in AR 70-38 for climatic conditions 1,4,6 and 7.

(4) Para 2.1.19.2. Testing shall be conducted within the temperature conditions specified in AR 70-38 for climatic conditions 1,4,6 and 7.

(5) Para 2.1.21.2. Several different radiation levels shall be used at various points outside each vehicle type to determine the validity of the attenuation factors over radiation ranges of 0.1 - 1000 rads/hour.

3.1.2 BASIC COMPARISONS TO BE DRAWN

The data source matrix, paragraph 4.0, delineates which criteria will be addressed by FAT, OT IIA or a combination of the two. RAM-D data will be aggregated from both tests.

3.2 OPERATIONAL TEST CONCEPT

3.2.1 SCOPE: The operational test is not envisioned to be longer than 60 days. Test sites which are indicative of Climatic Categories 1,4,6 and 7 are needed, as well as a test site where beach atmosphere exists. Ten test items are expected to be available for operational testing. Field testing should be conducted by radiological survey and monitoring parties organic to combat arms company sized units. The general data derived from operational testing will require manual data collection.

3.2.2 TACTICAL CONTEXT: Operational testing should be conducted under conditions simulating the post-nuclear attack environment, where radiological surveys and monitoring can be conducted. Weather conditions should parallel climatic conditions 1,4,6, and 7 if possible, and an ocean beach atmosphere. The meter must be mounted for testing in the M113, M60A1/A3, M151A2, M577, XM1, XM2 and M880.

3.2.3 SAMPLE SIZES: The ten items for testing should be used to the maximum extent possible to develop the largest sample size possible for each issue.

3.2.4 ANALYSIS CONCEPT: Comparisons between the AN/VDR-1 and both the IM 174A/PD and AN/PDR-77() will be made as follows: (1) subjectively determine whether the VDR-1 can be read easier than the other two; (2) measure the length of time difference required to train operators to use the other two combined; and (3) measure the length of time required to train maintainers vs the already tabulated times required to train maintainers on both systems.

3.2.5 DATA PRESENTATION: Ordinary tables, graphs and lists will suffice for reporting test results.

3.3 ANALYSIS PROCEDURES: Data assemblies will be made from DT II, OT II, FAT and OT IIA. Normal distribution curves will be used where applicable. The significance level will be as specified in applicable criteria.

3.4 DEVELOPMENT TEST OVERVIEWS: DT II was conducted by the US Army Materiel Test and Evaluation Directorate (ARMTE) at White Sands Missile Range (WSMR) during Feb - Sep 76. DT II showed several deficiencies related to skin temperature, high temperatures, high humidity, ocean spray atmosphere, submersion test, fungus growth, weight, power drain on vehicle, mounting brackets, thermal survivability, MTBF and marking of components. FAT is to be conducted during July - October 1980 to retest failed/ deficient areas. The data source matrix at paragraph 4.0 delineates test data sources.

3.5 DATA SOURCES:

The documents useful for evaluating operational issues follow:

(1) QMR, dated 3 Mar 71.
(2) IER for OT II, dated Aug 78.
(3) IER for DT II, dated Feb 78.
(4) TR for FAT.
(5) TR for OT IIA.

3.6 KEY PERSONNEL:

AGENCY	OFFICE SYMBOL(S)	AUTOVON
USATRADOC	ATCD-Z	680-4411
	ATCD-T	680-3681
USAARENBD	ATZR-AE-EN	464-7643/8331
USACMLS	ATZN-CM-CDT	584-3392/3823 and 865-4677/5614
CSTA LAB	DELCS-K	996-5545/5714
USAOTEA	DACS-TEO-N	289-1838
USALEA	DALO-LEI	977-7139
USALEA(DCSLOG-DA)	DALO-TSE	225-9745
DCSOPS, DA	DAMO-NCC	277-6600
DCSRDA, DA	DAMA-CSS-C	224-3990
USATECOM	DRSTE-AD-A	283-5278

4.0 DATA SOURCE MATRIX

ISSUES	CRITERIA	OT IIA	FAT
2.1 Mission Performance			
	2.1.1.2.1	P	---

ISSUES	CRITERIA	OT IIA	FAT
	2.1.1.2.2	P	---
	2.1.1.2.3	P	---
	2.1.2.2.1	P	S
	2.1.2.2.2	P	S
	2.1.2.2.3	P	S
	2.1.3.2	P	---
	2.1.4.2.1	P	P
	2.1.4.2.2	P	S
	2.1.4.2.3	P	S
	2.1.4.2.4	P	---
	2.1.5.2.1	P	S
	2.1.5.2.2	P	S
	2.1.6.2.1	P	S
	2.1.6.2.2	P	---
	2.1.6.2.3	P	---
	2.1.6.2.4	P	S
	2.1.7.2.1	P	P
	2.1.7.2.2	P	P
	2.1.8.2.1	P	S
	2.1.8.2.2	P	S
	2.1.9.2	S	P
	2.1.10.2.1	S	P
	2.1.10.2.2	P	P
	2.1.11.2	---	P
	2.1.12.2.1	P	P
	2.1.12.2.2	P	P
	2.1.12.2.3	P	P
	2.1.13.2.1	P	P
	2.1.13.2.2	P	P
	2.1.14.2.1.1	P	P
	2.1.14.2.1.2	P	P
	2.1.14.2.1.3	P	P
	2.1.14.2.1.4	P	P

ISSUES	CRITERIA	OT IIA	FAT
	2.1.14.2.2	P	P
	2.1.14.2.3	P	---
	2.1.14.2.4	P	P
	2.1.14.2.5	S	P
	2.1.14.2.6	S	P
	2.1.14.2.7	P	---
	2.1.15.2.1	P	P
	2.1.15.2.2	P	P
	2.1.16.2	P	P
	2.1.17.2.1	---	P
	2.1.17.2.2	---	P
	2.1.18.2.1	P	P
	2.1.18.2.2	P	---
	2.1.19.2	S	P
	2.1.20.2.1	---	P
	2.1.20.2.2	---	P
	2.1.21.2	---	P
	2.1.22.2.1	P	P
	2.1.22.2.2	P	P
	2.1.22.2.3	P	P
	2.1.22.2.4	P	P
	2.1.22.2.5	P	---
	2.1.22.2.6	P	---
	2.1.23.2.1	P	P
	2.1.23.2.2	P	P
	2.1.23.2.3	---	P
	2.1.23.2.4	---	P
	2.1.24.2	P	P
2.2 Logistics			
	2.2.1.2	P	---
	2.2.2.2	P	S
	2.2.3.2.1	S	P
	2.2.3.2.2	S	P
	2.2.3.2.3	S	P
	2.2.3.2.4	P	P

ISSUES	CRITERIA	OT IIA	FAT
	2.2.4.2	S	P
	2.2.5.2.1	P	S
	2.2.5.2.2	P	S
	2.2.5.2.3	P	S
	2.2.5.2.4	P	S
	2.2.5.2.5	P	S
	2.2.6.2	P	---
	2.2.7.2.1	P	---
	2.2.7.2.2	P	---
2.3 RAM-D	2.3.1.2	S	P
	2.3.2.2	---	P
	2.3.3.2.1	P	P
	2.3.3.2.2	P	P
	2.3.3.2.3	P	P
	2.3.3.2.4	P	P
	2.3.3.2.5	P	P
2.4 Survivability/Vulnerability	2.4.1.2	---	P
	2.4.2.2.1	---	P
	2.4.2.2.2	P	P
	2.4.2.2.3	P	P
2.5 Environmental	2.5.1.2	P	P
	2.5.2.2	S	P
	2.5.3.2.1	S	P
	2.5.3.2.2	S	P
	2.5.4.2.1	S	P
	2.5.4.2.2	P	P
	2.5.4.2.3	P	P
2.6 Deployability	2.6.1.2.1	P	P
	2.6.1.2.2	P	---

ISSUES	CRITERIA	OT IIA	FAT
2.7 Personnel Selection			
	2.7.1.2.1	P	S
	2.7.1.2.2	P	---
2.8 Publications			
	2.8.1.2	P	P
2.9 Safety			
	2.9.1.2.1	S	P
	2.9.1.2.2	P	P
2.10 Training			
	2.10.1.2.1	P	---
	2.10.1.2.2	P	---

P = Principle Source
S = Secondary Source

5.0 MAJOR MILESTONE CHART

a.	IEP - TRADOC receive from USACMLS	T-360
b.	IEP - TRADOC approve	T-330
c.	IEP - USAARENBD receive approved IEP from TRADOC	T-300
d.	OTP - USACMLS provide scope to USAARENBD	T-240
e.	OTP - TRADOC receive from USAARENBD	T-200
f.	MTSP - USAARENBD receive from CSTA Lab	T-180
g.	NET TSP - USAARENBD receive from CSTA Lab	T-180
h.	Combat/Training Developer TSP - USACMLS provide to USAARENBD	T-180
i.	TDP - USAARENBD submit draft to USACMLS for coordination	T-90
j.	TDP - USAARENBD submit to TRADOC for approval	T-60
k.	FAT - Begin Test	T-31
l.	TDP - TRADOC approve	T-30
m.	Safety Release - USAARENB receive through chain: CSTA Lab to DARCOM Safety Officer to TRADOC Safety Officer to USAARENBD	T-30
n.	OTRS - USAARENBD receive from CSTA Lab	T-30
o.	Test Items - received by USAARENB from CSTA Lab	T-30
p.	OTRS - USAARENB receive from USACMLS	T-1
q.	OT IIA - Begin Test	T-date (1 Sep 80)
r.	FAT - End Test	T+30
s.	FAT Test Report - USACMLS receive from CSTA Lab/TECOM	T+90
t.	OT IIA - End	T+90

u.	OT IIA Test Report - USACMLS receive from USAARENBD	T+150
v.	IER - TRADOC receive from USACMLS	T+195
w.	Special IPR	T+210

ANNEX A
INDEPENDENT EVALUATION PLAN (IEP) FOR
OT IIA OF AN/VDR-1()

1. The following agencies did not respond to the US Army Chemical School request for comments on the draft IEP for OT IIA of the AN/VDR-1():

a. US Army Training and Doctrine Command (ATCD-T, ATCD-C, ATCD-S, ATCD-AM).

b. US Army TRADOC Combined Arms Test Activity (ATCAT-OP-P)

c. US Army Combat Developments Experimentation Command (ATEC-PPA)

d. US Army Signal Center and Ft Gordon (ATSN-CD-TE)

e. US Army TRADOC Systems Analysis Activity (ATAA-CD)

2. The following agencies concurred with the draft IEP without comment:

a. US Army Combined Arms Center and Ft Leavenworth (ATZLCA-DM)

b. US Army Administration Center and Ft Benjamin Harrison (ATZI-PI)

c. US Army Military Police School/Training Center and Ft McClellan (ATSJ-CD)

d. US Army Nuclear and Chemical Agency (MONA-SAL)

e. US Army Field Artillery School (ATSF-CD-TE)

f. US Army Quartermaster School (ATSM-CD)

g. US Army Transportation School (ATSP-CD-TE)

3. This HQ concurred in total with the comments provided by the below listed agencies. Appropriate changes were made to the IEP.

a. US Army Training and Doctrine Command (ATCD-Z)

b. US Army Armor Center and Ft Knox (ATZK-CD-TE)

c. US Army Test and Evaluation Command (DRSTE-CT-T)

d. US Army Infantry School (ATSH-CD-MS-C)

e. US Army Materiel Systems Analysis Activity (DRXSY-RE)

f. US Army Combat Surveillance and Target Acquisition Laboratory (DELCS-K)

g. US Army Armor and Engineer Board (ATZK-AE-TA)

4. Total number of comments received: 72.
Total number USACMLS concurs with: 68.
Total number USACMLS partially/non-concurs with: 4.

5. The following agencies and the specific comments listed below were non-concurred or partially concurred with.

a. US Army Logistics Center (ATCL-FT)

(1) Comment. Logistics, paragraph 2.0. "Recommend the following logistics supportability area be addressed as a separate and critical issue with associated scope and criterion: Adequacy of the logistics support concept, e.g. is supply and/or maintenance concept supportive of the operation and maintenance of the AN/VDR-1?"

Concur in part: IAW para c-5c of TRADOC Reg 71-9, the only subcategory of logistics supportability which was not tested to satisfaction in OT II was the guidelines on technical manuals. Appropriate test issue and criteria will be included in the IEP.

(2) Comment: Logistics, paragraph 2.0. "Recommend the following logistics supportability area be addressed as separate and critical issues with associated scope and criterion: Adequacy of support personnel, e.g. are appropriate military personnel assigned to perform serviceability and maintenance as required?; Adequacy of materiel, e.g. does the equipment design lend itself to serviceability and maintainability?"

Non-concur: These issues were tested and satisfactorily answered in the OT II Test Report.

b. US Army Operational Test and Evaluation Agency (CSTE-PON).

Comment: General commen. "IEP omits paragraphs 1 (introduction), 6 (Operational Test Concept), 7 (Analysis Procedures), 8 (DT Overview), 9 (Data Sources), and 11 (Key Personnel) of format suggested by AR 71-3 and at a minimum, should be revised to include the operational test concept."

Non-concur: Annex E of TRADOC 71-9 was complied with in total for this category 4 system. TRADOC Reg 71-9 modifies the requirement of AR 71-3.

c. Academy of Health Sciences (HSA-CDM).

Comment: Concept of Employment, paragraph 1.4. "It does not address a possible medical need of one per ambulance for monitoring of casualties and makes no mention of use by Army air or sea craft. Both issues need to be specifically addressed. The basis of issue and compatibility with power sources are potentially significant."

Non-concur: The AN/VDR-1 has been type classified as Limited Procurement. The fielding plan has already been developed, and assignment to ambulances was not considered. Therefore, OT IIA will not address the issue.

SUPPLEMENTARY

INFORMATION

AD-A081 504

DEPARTMENT OF THE ARMY
US ARMY CHEMICAL SCHOOL
FORT MC CLELLAN, ALABAMA 36205
(Presently located at APG, MD 21010)

2 APR 1980

ATZN-CM-CDT

SUBJECT: Change One to Independent Evaluation Plan (IEP) for OT IIA of Radiac Set AN-VDR-1()

SEE DISTRIBUTION

1. Reference

a. US Army Logistic Center letter, ATCL-ME, undated, subject: Request for TRADOC Approval of Independent Evaluation Plan (IEP) for OT IIA of Radiac Set AN/VDR-1().

b. US Army Combat Surveillance and Target Acquisition Laboratory letter, dated 28 Feb 80, subject: Independent Evaluation Plan (IEP) for OT IIA for Radiac Set AN/VDR-1.

2. Make the following page for page substitutions:

REMOVE PAGE	ADD PAGE
5	5
8	8
9	9
11	11
12	12
13	13
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
--	B-1, B-2

ATZN-CM-CDT
SUBJECT: Change One to Independent Evaluation Plan (IEP) for OT IIA of Radiac Set AN-VDR-1()

3. Post this cover letter to the front of the subject IEP.

4. POC at this headquarters is CPT Snyder, AUTOVON 584-3392/3823.

FOR THE COMMANDANT:

Arnold O'Novack LTC, CmlC
for WALTON A. PHILLIPS
Colonel, CmlC
Assistant Commandant

21 Incl
as

DISTRIBUTION:

Commander, US Army Training and Doctrine Command, ATTN: ATCD-C, ATCD-T, ATCD-S, ATCD-Z, Ft Monroe, VA 23651
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Commander, US Army Logistics Center, ATTN: ATCL-FT, Ft Lee, VA 23801
Commander, US Army Administration Center and Ft Benjamin Harrison, ATTN: ATZI-PI, Ft Benjamin Harrison, IN 46216
Commander, US Army Test and Evaluation Command, ATTN: DRSTE-CT-T (Mr. Kadel)/US Army TRADOC LO, Aberdeen Proving Ground, MD 21005
Commander, US Army Signal Center and Ft Gordon, ATTN: ATSN-CD-TE, Ft Gordon, GA 30905
Commander, US Army Nuclear and Chemical Agency, ATTN: MONA-SAL, 7500 Backlick Road, Bldg 2073, Ft Belvoir, VA 22060
Director, US Army Materiel Systems Analysis Activity, ATTN: DRXSY-RE, Aberdeen Proving Ground, MD 21005
Director, US Army TRADOC Systems Analysis Activity, ATTN: ATAA-CD, White Sands Missile Range, NM 88002
Director, US Army Combat Surveillance and Target Acquisition Laboratory, ATTN: DELCS-K (Mr. Leonard), Ft Monmouth, NJ 07703
✓Defense Documentation Center, Cameron Station, ATTN: DDC-TCA, Alexandria, VA 22314
President, US Army Armor and Engineer Board, ATTN: ATZK-AE-TA, Ft Knox, KY 40121

2.1.6.3 RATIONALE: The system must be designed so as not to interfere with other critical operations inside the vehicle.

2.1.6.4 SOURCE: QMR, para 8b(9) and 8b(10); USAOCCS IER, Aug 78, page B-2, item 7.

*2.1.7 ISSUE: Is adequate mounting hardware provided?

2.1.7.1 SCOPE: Mounting hardward will be verified as fitting the following vehicles: M113, M60A1/A3, M151A2, M577, XM1, XM2, and M880.

2.1.7.2 CRITERIA:

2.1.7.2.1 Mounting hardward shall be provided for mounting the radiac set in tactical vehicles.

2.1.7.2.2 The number of different mounting hardware items used in different types of vehicles shall be the minimum possible, eg., the ideal is for a universal mount for all vehicles.

2.1.7.3 RATIONALE: Mounting prevents abuse during vehicular surveys and other transportation. Also, the driver can be the operator if the system is mounted in the vehicle.

2.1.7.4 SOURCE: QMR, para 8b(6).

*2.1.8 ISSUE: Does the mounting system facilitate mounting and dismounting of the system?

2.1.8.1 SCOPE: Testing will measure the length of time to mount (also to remove) the system from its mounting brackets when operator is in normal combat clothing as well as in full chemical protective clothing.

2.1.8.2 CRITERION: The system shall be capable of being easily mounted onto or disconnected from the mounting brackets in tactical vehicles within:

2.1.8.2.1 One minute by personnel in l combat clothing.

2.1.8.2.2 Three minutes by personnel i .ull Mission Oriented Protective Posture (MOPP level 4).

2.1.8.3 RATIONALE: Installation and removal of the system from vehicles should not be time consuming or difficult to prevent degradation of the mission.

2.1.14.2 CRITERIA:

2.1.14.2.1 The warning device must be:

2.1.14.2.1.1 Presettable in increments of 20% of full range scale for all ranges.

2.1.14.2.1.2 Audible.

2.1.14.2.1.3 Visual.

2.1.14.2.1.4 Integral to the ratemeter.

2.1.14.2.2 The visual and audible alarms should each be independently controlled.

2.1.14.2.3 The audible alarm should not disrupt two-way radio communications, dependent upon monitor switch position on Control, Interconnection Set C-2298/VRC in armored vehicles.

2.1.14.2.4 The visual alarm should be capable of being dimmed or extinguished.

2.1.14.2.5 When the alarm is preset to a particular dose rate, the alarm shall trigger when the actual reading is within $\pm$ 20% of the preset value.

2.1.14.2.6 The activated, but untriggered, alarm shall not cause an appreciable drain on the power source.

2.1.14.2.7 The audible and visual alarms must be effective in gaining the attention of the operator.

2.1.14.3 RATIONALE: A warning device serves to expand the role of the system from merely a ratemeter to an alarm. However, the light and noise from the alarm must coincide with acceptable OPSEC procedures. An alarm that does not interfere with radio transmission and reception is an aid, not a hinderance.

2.1.14.4 SOURCE: QMR, para 1b and 10e; USAOCCS IER, Aug 78, para 2-3g(3)(h).

*2.1.15 ISSUE: Is the system capable of the modes of operation prescribed by FM 3-12 and local SOPs?

2.1.15.1 SCOPE: Testing will assess the system's ability to perform both continuous and intermittent monitoring and determine the length of time to perform pre-operational checks.

2.1.15.2 CRITERIA:

2.1.15.2.1 The system shall be capable of continuous and intermittent operation.

2.1.15.2.2 The pre-operational checks, to include warm-up time, shall not exceed five minutes under temperature ranges indicative of climatic categories 1,4,6 and 7. For climatic category 4, operation at +125°F and storage at +160°F shall be excluded.

2.1.15.3 RATIONALE: FM 3-12 and many local SOPs require both continuous and intermittent monitoring.

2.1.15.4 SOURCE: QMR, para 2b and 7b(6).

*2.1.16 ISSUE: Can the ratemeter respond to either the internal detector or external probe without disconnecting the probe?

2.1.16.1 SCOPE: Testing will determine whether or not the system can respond to either the internal detector or external probe without disconnecting the probe.

2.1.16.2 CRITERION: A manual switching control shall be provided to enable the ratemeter to respond to either the internal detector or the external personnel monitoring probe without physically disconnecting the monitoring probe.

2.1.16.3 RATIONALE: Operations is facilitated by not having to remove the probe to use the internal detector.

2.1.16.4 SOURCE: QMR, para 8b(4).

*2.1.17 ISSUE: Can the system respond rapidly to changes in radiation doserates?

2.1.17.1 SCOPE: Testing will determine how quickly the system responds to within 10% of its final reading.

2.1.17.2 CRITERIA:

2.1.17.2.1 The ratemeter shall respond to within 10% of its final reading within two seconds when it is exposed to sudden changes in radiation dose rate.

2.1.17.2.2 The plug-in monitoring probe shall respond to within 10% of its final reading within six seconds when it is exposed to sudden changes in radiation dose rate.

2.1.20.1 SCOPE: Testing will determine whether or not the system can be accurately calibrated in a field radiac calibrator.

2.1.20.2 CRITERIA:

2.1.20.2.1 Calibration of the system shall be accomplished by the TS-784 ()/PD field radiac calibrator or by its replacement.

2.1.20.2.2 After calibration, the system shall meet the accuracy criteria listed in paragraph 2.1.23.2.3.

2.1.20.3 RATIONALE: The system has to be calibrated using a source readily available in the field.

2.1.20.4 SOURCE: QMR, para 7c.

2.1.21 ISSUE: Are attenuation factors provided, and are they adequate, for the determination of radiation levels exterior to the vehicle in which the VDR-1 is mounted?

2.1.21.1 SCOPE: Testing will assess the validity of the attenuation factors provided for each vehicle intended for use as a carrier (M113, M60A1/A3, M151A2, M577, XM1, XM2 and M880). Assessment of the attenuation factors for the XM2 and M880 is contingent upon completion of radiation attenuation tests on these vehicles prior to OT IIA.

2.1.21.2 CRITERION: When the standardized attenuation factor is applied to the instrument reading, the result will be within $\pm$ 20% of true dose at the 95% confidence level of the actual exterior reading.

2.1.21.3 RATIONALE: Attenuation is a function of the location of the instrument within the vehicle. In order to determine the exterior contamination level, a standard factor must be developed for each vehicle and each mounting location in each vehicle.

2.1.21.4 SOURCE: Academy of Health Sciences letter of 2 Aug 79; USACMLS MSD-RAD; QMR, para 1b.

*2.1.22 ISSUE: Is the information plate present and adequate?

2.1.22.1 SCOPE: Operator test soldiers will assess whether or not they can read and understand the plates, to include when the system is mounted in vehicles. Testing will assess how well the plates remain attached and readable after field usage of mounting/dismounting, operation, cleaning and decontaminating. Attenuation data for the XM2 and M880 is contingent upon completion of radiation attenuation tests on these vehicles prior to OT IIA.

2.1.22.2 CRITERIA:

2.1.22.2.1 The item may be a card or a plate.

2.1.22.2.2 The plate shall be waterproof.

2.1.22.2.3 The plate shall list the radiacmeter mounting location correlation factor for the tactical vehicle for which each specific installation kit was developed.

2.1.22.2.4 The plate shall be semi-permanently affixed to the ratemeter or the mount.

2.1.22.2.5 The plate shall be clearly visible when the system is used in a vehicular survey mode.

2.1.22.2.6 The plate shall be capable of replacement at organizational level.

2.1.22.3 RATIONALE: Operators must know where the system can be mounted in their vehicle and what the attenuation factors are. Therefore, the plate bearing that information must be visible and readable.

2.1.22.4 SOURCE: QMR, para 8b(8).

*2.1.23 ISSUE: Does the system have an adequate range for accuracy radiation measurement?

2.1.23.1 SCOPE: Testing will measure the range of the system; will determine the accuracy of the system, and determine the system's ability to detect beta radiation.

2.1.23.2 CRITERIA:

2.1.23.2.1 Lower range must be one millirad/hour or less.

2.1.23.2.2 Upper range must be 1000 rad/hour or greater.

2.1.23.2.3 Overall system error for measuring gamma and X-ray radiation shall not exceed ± 20% of the true dose at that location. The required accuracy applies to the total dose rate from a representative fallout spectra, which may be encountered as a result of nuclear weapons employment. Tapping or vibration (in excess of normal vehicular vibrations) shall not be permitted in meeting criterion.

2.1.23.2.4 The system shall detect surface beta radiation in the presence of a gamma radiation field of 100 millirad/hour or less as stipulated in MIL-R-49356(ER).

2.1.23.3 RATIONALE: The VDR-1 must be at least comparable to the systems

it is to replace (IM-174/PD, IM-174A/PD, and AN/PDR-27()).

2.1.23.4 SOURCE: QMR, para 1b; MIL-R-49356(ER); USAOCCS IER, Aug 78.

*2.1.24 ISSUE: Is the gamma and X-ray radiation detection capability appropriately divided between the sensor internal to the ratemeter and the sensor in the monitoring probe?

2.1.24.1 SCOPE: Testing will determine the actual range over which the system measures gamma and X-ray radiation using the probe and the ratemeter individually.

2.1.24.2 CRITERION: The coverage ranges should be one-tenth millirad/hour to 100 millirad/hour in three selectable ranges for the monitoring probe, and 100 millirad/hour to 1000 rad/hr in four selectable ranges for the ratemeter.

2.1.24.3 RATIONALE: Lower dose-rates are important when monitoring personnel and food. A probe is easier to manipulate in these cases. For area surveying, an integral ratemeter is easier to use.

2.1.24.4 SOURCE: QMR, para 1b.

2.2 LOGISTICS

*2.2.1 ISSUE: Is the time required for servicing the system within the required specifications?

2.2.1.1 SCOPE: Testing will determine the length of time required to perform servicing or checking out of the system under both field and maintenance shop conditions.

2.2.1.2 CRITERION: Assuming no repairs are required the time necessary to service or check out the system (including warm up time) IAW applicable draft equipment publications procedures under both field and maintenance shop conditions shall not exceed five minutes.

2.2.1.3 RATIONALE: Servicing time should be as minimal as possible to reduce the burden on the unit's operation.

2.2.1.4 SOURCE: QMR, para 2b.

*2.2.2 ISSUE: Can preventive and in-storage maintenance be performed quickly by appropriate personnel?

2.2.2.1 SCOPE: Preventive and in-storage maintenance will be performed by 35B MOS test soldiers and user soldiers under appropriate field and depot conditions and assessed for ease and length of time.

2.3.2.2 CRITERION: At least 85% of the systems shall function properly after a period of storage of at least three years under the conditions of storage listed in paragrapn 2.5.1.2.

2.3.2.3 RATIONALE: As small a number of systems as possible should fail after storage so as to be the least possible burden on the logistical system.

2.3.2.4 SOURCE: QMR, para 7f.

*2.3.3 ISSUE: Does the system meet the required minimum acceptable value (MAV) of the mean time between failure (MTBF)?

2.3.3.1 SCOPE: Testing will determine whether the system meets the requirement.

2.3.3.2 CRITERION: The MAV for the system is 400 hours MTBF.

2.3.3.3 RATIONALE: The MAV of the MTBF will be an indicator of the level of the burden of the system upon the maintenance system.

2.3.3.4 SOURCE: QMR, para 9a; JWG meeting of 18 Jun 79; MSD-RAD, USACMLS.

*2.3.4 ISSUE: Does the system meet the required best operational capability (BOC)?

2.3.4.1 SCOPE: Developmental testing will determine whether the system meets the requirement.

2.3.4.2 CRITERION: The BOC for the syste 800 hours.

2.3.4.3 RATIONALE: The BOC will be an indi ator of the level of the burden of the system on the logistics system.

2.3.4.4 SOURCE: QMR, para 9a; MSD-RAD, USACMLS.

*2.3.5 ISSUE: Does the system meet the required mean time to repair (MTTR) at organizational level of maintenance?

2.3.5.1 SCOPE: Testing will determine whether the system meets the requirement.

2.3.5.2 CRITERION: The MTTR for the system is ten minutes at organizational level.

2.3.5.3 RATIONALE: The MTTR will be an indicator of the level of the burden of the ADR-6 on the logistics system.

2.3.5.4 SOURCE: QMR, para 9a; MSD-RAD, USACMLS.

2.4 SURVIVABILITY/VULNERABILITY

*2.4.1 ISSUE: Can the system survive nuclear effects?

2.4.1.1 SCOPE: Testing will assess the inherent ability of the system to withstand the nuclear effects of air blast, thermal radiation, initial nuclear radiation and electromagnetic pulse. Testing will be conducted during developmental testing.

2.4.1.2 CRITERION: The system shall withstand the nuclear effects as stipulated in MIL-N-49357(N) for Radiac Set AN/VDR-1 not reproduced here due to security classification.

2.4.1.3 RATIONALE: Military tactical equipment must withstand nuclear effects.

2.4.1.4 SOURCE: QMR, para 8f.

*2.4.2 ISSUE: Can the system be decontaminated?

2.4.2.1 SCOPE: Testing will assess the impact on the function of the system after undergoing decontamination by soap and water, then DS-2. Testing will assess the design of the system for contributions to minimization of NBC contamination.

2.4.2.2 CRITERIA:

2.4.2.2.1 The system shall be designed so as to minimize contamination by chemical and biological agents and radiological materials.

2.4.2.2.2 Components of the system shall be readily capable of decontamination with minimum effect on their proper operation.

2.4.2.3 RATIONALE: Equipment must operate in an NBC environment, part of which is the post-decontamination environment.

2.4.2.4 SOURCE: QMR, para 8f.

2.5 ENVIRONMENTAL

*2.5.1 ISSUE: Is the system capable of operation with the required accuracy under various climatic conditions?

2.5.1.1 SCOPE: Testing will assess the equipment's ability to operate during and after exposure to various climatic categories.

2.5.1.2 CRITERION: The system must be capable of being tactically operated with the required accuracy of ± 20%, stored and transported during and after exposure to climatic categories 1,4,6,7 (and 8 desired) as defined in AR 70-38. For climatic category 4, operation at +125°F and storage at +160°F shall be excluded.

2.5.1.3 RATIONALE: Military tactical equipment must be capable of operating under a wide range of climatic conditions.

2.5.1.4 SOURCE: QMR, para 2a and 7a (1); JWG meeting of 18 Jun 79; AR 70-38.

*2.5.2 ISSUE: Does the system prevent fungal growth?

2.5.2.1 SCOPE: Testing will assess the ability of the system to prevent fungal growth.

2.5.2.2 CRITERION: External and internal parts shall not support fungal growth as encountered world wide.

2.5.2.3 RATIONALE: Fungal growth can render military equipment inoperative unless the system is designed to retard/prevent its growth.

2.5.2.4 SOURCE: QMR, para 7a(3); MIL-R-49356(ER); MIL-STD-454, requirement 4.

*2.5.3 ISSUE: Can the system function after submersion in water?

2.5.3.1 SCOPE: Testing will assess the water tightness of the system during complete submersion.

2.5.3.2 CRITERIA: The system shall operate within the prescribed degree of accuracy of ± 20% after complete and continuous submersion in fresh water for a period of:

2.5.3.2.1 30 minutes. (QMR)

2.5.3.2.2 2 hours (MIL-STD-810)

2.5.3.3 RATIONALE: Military equipment is often subjected to short periods of submersion and rain.

2.5.3.4 SOURCE: QMR, para 7a(3), MIL-STD-810, MIL-R-49356(ER), JWG meeting of 18 Jun 79.

*2.5.4 ISSUE: Can the system withstand a salt atmosphere?

2.5.4.1 SCOPE: Testing will assess the ability of the system to be

operated during and after exposure to a salt atmosphere.

2.5.4.2 CRITERIA:

2.5.4.2.1 The system shall be capable of withstanding, without damage, normal ocean beach atmospheric corrosion for one year.

2.5.4.2.2 The system shall operate within specifications during exposure to a normal ocean beach atmosphere for 30 days without cleaning except for the external surfaces and contact points which will be cleaned IAW Draft Equipment Manuals (operator level) every 48 hours.

2.5.4.3 RATIONALE: Military equipment must function after exposure to a salt environment for extended periods of time.

2.5.4.4 SOURCE: QMR, para 7a(2); JWG Meeting of 18 Jun 79; FONECON with Mr. Leonard (CSTA Lab) on 14 Jan 80.

2.6 DEPLOYABILITY

*2.6.1 ISSUE: Can the system adequately withstand vibration and shocks?

2.6.1.1 SCOPE: Testing will assess the ability of the system to withstand vibration and shocks while being transported in the appropriate operational mode in vehicles, aircraft, vessels, and also when dropped in its combat transportation mode.

2.6.1.2 CRITERIA:

2.6.1.2.1 The system shall be constructed to operate within required specifications after transport under combat conditions in tactical vehicles over rough terrain and in aircraft and vessels, as well as after shocks incurred when dropped in its combat transportation mode.

2.6.1.2.2 The system shall withstand shocks and vibrations coincident with soldier handling under simulated combat conditions, and still function within required specifications.

2.6.1.3 RATIONALE: The system must remain operational under the rigors of combat transportation and usage.

2.6.1.4 SOURCE: QMR, para 8d; MIL-STD-810; MIL-S-901.

2.7 PERSONNEL SELECTION

*2.7.1 ISSUE: Can the system be maintained by properly trained 31V and 35B MOS personnel?

2.7.1.1 SCOPE: Testing will verify that properly trained 35B and 31V MOS personnel can perform prescribed maintenance on the VDR-1, and will assess the validity of the training concept for maintenance personnel.

2.7.1.2 CRITERIA:

2.7.1.2.1 The AN/VDR-1 will be repairable/maintainable IAW draft equipment publications by properly trained 35B and 31V MOS personnel.

2.7.1.2.2 The training concept for the maintenance personnel will be adequate to allow maintainers to perform their mission.

2.7.1.3 RATIONALE: 35B personnel have been designated as the appropriate maintenance personnel for this system. As such, they must be capable of performing that prescribed maintenance.

2.7.1.4 SOURCE: Combat and Training Developer Test Support Package, date 10 Nov 75.

2.8 PUBLICATIONS

*2.8.1 ISSUE: Do the draft equipment publications conform in content and format to required specifications?

2.8.1.1 SCOPE: The draft equipment publications will be compared with the requirements outlined in AR 310-3, MIL-M-38784(A) and MIL-M-6300(TM) series, as applicable.

2.8.1.2 CRITERION: The draft equipment publications will meet the requirements of AR 310-3, MIL-M-38784(A) and MIL-M-6300(TM) series, as applicable.

2.8.1.3 RATIONALE: Military equipment publications must be properly formatted.

2.8.1.4 SOURCE: AR 310-3.

2.9 SAFETY

*2.9.1 ISSUE: Is the system safe to both operate and maintain?

2.9.1.1 SCOPE: Testing will assess whether or not the system is free of operational and maintenance hazards.

2.9.1.2 CRITERIA:

2.9.1.2.1 The system will be free of safety hazards from noise and noxious gases.

2.9.1.2.2 Operating personnel shall be adequately protected against high voltage.

2.9.1.3 RATIONALE: Military equipment should be as safe to operate and maintain as possible.

2.9.1.4 SOURCE: QMR, para 8e and 10c.

2.10 TRAINING

*2.10.1 ISSUE: Can the representative soldier perform the critical operational and tactical tasks with appropriate skills, knowledge, motivation, and appreciation of the system's capabilities and limitations to the prescribed standard?

2.10.1.1 SCOPE: The proposed tactical training system elements and procedures developed by TRADOC proponent school will be analyzed during pretest training by evaluating test players' performance prior to training transfer/effectiveness and applicability of required critical tasks in both unit and institutional environments will be assessed. Requirements of the proposed training system in terms of time (to include extra time required for players to achieve desired performance levels), personnel, media, and other assets will be recorded for COEA/CTEA purposes. The tactics employed by the test players should be observed to ascertain that they are employing equipment correctly and not degrading the capability of the equipment. This is measured and compared to the ARTEP/revised ARTEP standards.

2.10.1.2 CRITERIA:

2.10.1.2.1 Upon completion of tactical training, as outlined in the ICTP, all of the test players will be able to perform all of the operational/tactical tasks to standards identified in either SQT type test or ARTEP without increasing training time, instructors or training material compared to training on the IM-174A/PD and AN/PDR-27() combined.

2.10.1.2.2 Upon completion of training, test players will operate the AN/VDR-1 to 100 percent of the designed equipment capability.

2.10.1.3 RATIONALE: The AN/VDR-1 should not require unacceptable increases in training requirements over the two systems it is to replace.

2.10.1.4 SOURCE: TRADOC Reg 71-9.

3.0 CONCEPT OF EVALUATION

3.1 EVALUATION PROCEDURES

3.1.1 INDEPENDENT AND DEPENDENT VARIABLES

The only criteria which have independent variables are as follows:

(1) Para 2.1.11.2. Vehicular power supply output should be varied at intervals of one volt beginning at 15 volts and ending at 24 volts.

(2) Para 2.1.15.2.2. The preoperational checks, to include warm up time, shall be conducted within the temperature ranges specified in AR 70-38 for climatic conditions 1,4,6 and 7, to determine if differences occur. Warm up time is probably the segment of time to be affected. For climatic category 4, operation at +125°F and storage at +160°F shall be excluded.

(3) Para 2.1.17.2.1 and 2.1.17.2.2. Testing shall be conducted within temperature conditions specified in AR 70-38 for climatic conditions 1, 4,6 and 7. For climatic category 4, operation at +125°F and storage at +160°F shall be excluded.

(4) Para 2.1.19.2. Testing shall be conducted within the temperature conditions specified in AR 70-38 for climatic conditions 1,4,6 and 7. For climatic category 4, operation at +125°F and storage at +160°F shall be excluded.

(5) Para 2.1.21.2. Several different radiation levels shall be used at various points outside each vehicle type to determine the validity of the attenuation factors over radiation ranges of 0.1 - 1000 rad/hour.

3.1.2 BASIC COMPARISONS TO BE DRAWN

The data source matrix, paragraph 4.0, delineates which criteria will be addressed by FAT, OT IIA or a combination of the two. RAM-D data will be aggregated from both tests.

3.2 OPERATIONAL TEST CONCEPT

3.2.1 SCOPE: The operational test is not envisioned to be longer than 60 days. Test sites which are indicative of Climatic Categories 1,4,6 and 7 are needed, as well as a test site where beach atmosphere exists. For climatic category 4, operation at +125°F and storage at +160°F shall be excluded. Ten test items are expected to be available for operational testing. Field testing should be conducted by radiological survey and monitoring parties organic to combat arms company sized units. The general data derived from operational testing will require manual data collection.

3.2.2 TACTICAL CONTEXT: Operational testing should be conducted under conditions simulating the post-nuclear attack environment, where radiological surveys and monitoring can be conducted. Weather conditions

should parallel climatic conditions 1,4,6, and 7 if possible, and an ocean beach atmosphere. For climatic category 4, operation at +125°F and storage at +160°F shall be excluded. The meter must be mounted for testing in the M113, M60A1/A3, M151A2, M577, XM1, XM2 and M880.

3.2.3 SAMPLE SIZES: The ten items for testing should be used to the maximum extent possible to develop the largest sample size possible for each issue.

3.2.4 ANALYSIS CONCEPT: Comparisons between the AN/VDR-1 and both the IM 174A/PD and AN/PDR-27() will be made as follows: (1) subjectively determine whether the VDR-1 can be read easier than the other two; (2) measure the length of time difference required to train operators to use the other two combined; and (3) measure the length of time required to train maintainers vs the already tabulated times required to train maintainers on both systems.

3.2.5 DATA PRESENTATION: Ordinary tables, graphs and lists will suffice for reporting test results.

3.3 ANALYSIS PROCEDURES: Data assemblies will be made from DT II, OT II, FAT and OT IIA. Normal distribution curves will be used where applicable. The significance level will be as specified in applicable criteria.

3.4 DEVELOPMENT TEST OVERVIEWS: DT II was conducted by the US Army Materiel Test and Evaluation Directorate (ARMTE) at White Sands Missile Range (WSMR) during Feb - Sep 76. DT II showed several deficiencies related to skin temperature, high temperatures, high humidity, ocean spray atmosphere, submersion test, fungus growth, weight, power drain on vehicle, mounting brackets, thermal survivability, MTBF and marking of components. FAT is to be conducted during August - September 1980 to retest failed/deficient areas. The data source matrix at paragraph 4.0 delineates test data sources.

3.5 DATA SOURCES:

The documents useful for evaluating operational issues follow:

(1) QMR, dated 3 Mar 71.
(2) IER for OT II, dated Aug 78.
(3) IER for DT II, dated Feb 78.
(4) TR for FAT.
(5) TR for OT IIA

3.6 KEY PERSONNEL:

AGENCY	OFFICE SYMBOL(S)	AUTOVON
USATRADOC	ATCD-Z	680-4411
	ATCD-T	680-3681
USAARENBD	ATZR-AE-EN	464-7643/8331
USACMLS	ATZN-CM-CDT	584-3392/3823
		and 865-4677/5614
CSTA LAB	DELCS-K	996-5545/5714
USAOTEA	DACS-TEO-N	289-1838
USALEA	DALO-LEI	977-7139
USALEA(DCSLOG-DA)	DALO-TSE	225-9745
DCSOPS, DA	DAMO-NCC	277-6600
DCSRDA, DA	DAMA-CSS-C	224-3990
USATECOM	DRSTE-AD-A	283-5278

4.0 DATA SOURCE MATRIX

ISSUES	CRITERIA	OT IIA	FAT
2.1 Mission Performance			
	2.1.1.2.1	P	---
	2.1.1.2.2	P	---
	2.1.1.2.3	P	---
	2.1.2.2.1	P	S
	2.1.2.2.2	P	S
	2.1.2.2.3	P	S
	2.1.3.2	P	---
	2.1.4.2.1	P	P
	2.1.4.2.2	P	S
	2.1.4.2.3	P	S
	2.1.4.2.4	P	---
	2.1.5.2.1	P	S
	2.1.5.2.2	P	S
	2.1.6.2.1	P	S
	2.1.6.2.2	P	---
	2.1.6.2.3	P	---
	2.1.6.2.4	P	S
	2.1.7.2.1	P	P
	2.1.7.2.2	P	P
	2.1.8.2.1	P	S

2.1.8.2.2	P	S
2.1.9.2	S	P
2.1.10.2.1	S	P
2.1.10.2.2	P	P
2.1.11.2	---	P
2.1.12.2.1	P	P
2.1.12.2.2	P	P
2.1.12.2.3	P	P
2.1.13.2.1	P	P
2.1.13.2.2	P	P
2.1.14.2.1.1	P	P
2.1.14.2.1.2	P	P
2.1.14.2.1.3	P	P
2.1.14.2.1.4	P	P
2.1.14.2.2	P	P
2.1.14.2.3	P	---
2.1.14.2.4	P	P
2.1.14.2.5	S	P
2.1.14.2.6	S	P
2.1.14.2.7	P	---
2.1.15.2.1	P	P
2.1.15.2.2	P	P
2.1.16.2	P	P
2.1.17.2.1	---	P
2.1.17.2.2	---	P
2.1.18.2.1	P	P
2.1.18.2.2	P	---
2.1.19.2	S	P
2.1.20.2.1	---	P
2.1.20.2.2	---	P
2.1.21.2	---	P
2.1.22.2.1	P	P
2.1.22.2.2	P	P

2.1.22.2.3	P	P
2.1.22.2.4	P	P
2.1.22.2.5	P	---
2.1.22.2.6	P	---
2.1.23.2.1	P	P
2.1.23.2.2	P	P
2.1.23.2.3	---	P
2.1.23.2.4	---	P
2.1.24.2	P	P

2.2 Logistics

2.2.1.2	P	---
2.2.2.2	P	S
2.2.3.2.1	S	P
2.2.3.2.2	S	P
2.2.3.2.3	S	P
2.2.3.2.4	P	P
2.2.4.2	S	P
2.2.5.2.1	P	S
2.2.5.2.2	P	S
2.2.5.2.3	P	S
2.2.5.2.4	P	S
2.2.5.2.5	P	S
2.2.6.2	P	---
2.2.7.2.1	P	---
2.2.7.2.2	P	---

2.3 RAM-D

2.3.1.2	S	P
2.3.2.2	---	P
2.3.3.2	P	P
2.3.4.2	S	P
2.3.5.2	P	S

2.4 Survivability/Vulnerability

2.4.1.2	---	P

	2.4.2.2.1	---	P
	2.4.2.2.2	P	P
2.5 Environmental			
	2.5.1.2	P	P
	2.5.2.2	S	P
	2.5.3.2.1	S	P
	2.5.3.2.2	S	P
	2.5.4.2.1	S	P
	2.5.4.2.2	P	P
2.6 Deployability			
	2.6.1.2.1	P	P
	2.6.1.2.2	P	---
2.7 Personnel Selection			
	2.7.1.2.1	P	S
	2.7.1.2.2	P	---
2.8 Publications			
	2.8.1.2	P	P
2.9 Safety			
	2.9.1.2.1	S	P
	2.9.1.2.2	P	P
2.10 Training			
	2.10.1.2.1	P	---
	2.10.1.2.2	P	---

P = Principle Source
S = Secondary Source

5.0 MAJOR MILESTONE CHART

a.	IEP - TRADOC receive from USACMLS	T-360
b.	IEP - TRADOC approve	T-330
c.	IEP - USAARENBD receive approved IEP from TRADOC	T-300
d.	OTP - USACMLS provide scope to USAARENBD	T-240
e.	OTP - TRADOC receive from USAARENBD	T-200
f.	MTSP - USAARENBD receive from CSTA Lab	T-180
g.	NET TSP - USAARENBD receive from CSTA Lab	T-180
h.	Combat/Training Developer TSP - USACMLS provide to USAARENBD	T-180
i.	TDP - USAARENBD submit draft to USACMLS for coordination	T-90
j.	FAT - Begin Test	T-67
k.	TDP - USAARENBD submit to TRADOC for approval	T-60
l.	TDP - TRADOC approve	T-30
m.	Safety Release - USAARENBD receive through chain: CSTA Lab to DARCOM Safety Officer to TRADOC Safety Officer to USAARENBD	T-30
n.	Test items - received by USAARENB from CSTA Lab	T-30
o.	OTRS - USAARENBD receive from CSTA Lab	T-22
p.	OTRS - USAARENB receive from USACMLS	T-1
q.	OT IIA - Begin Test	T-date (6 Oct 80)
r.	FAT - End Test	T+30
s.	OT IIA - End	T+56
t.	FAT Test Report - USACMLS receive from CSTA Lab/TECOM	T+90
u.	OT IIA Test Report - USACMLS receive from USAARENBD	T+120
v.	IER - TRADOC receive from USACMLS	T+165
w.	Special IPR	T+180

ANNEX B
INDEPENDENT EVALUATION PLAN (IEP) FOR
OT IIA OF AN/VDR-1()

1. The following agencies forwarded additional comments to this headquarters on the final IEP for the VDR-1:

a. USALOGC, ATCL-ME. Five additional comments were forwarded, all of which were concurred with. Appropriate changes to the IEP have been made.

b. CSTA Lab, DELCS-K. Eighteen additional comments were forwarded, fifteen of which were concurred with. Appropriate changes to the IEP have been made The three comments with which this headquarters non-concurred follow:

(1) Two Comments: Para 2.1.1.2.1 and 2.1.1.2.2. "Delete. Reason: The scope is incomplete in this comparison test, since it lists only tactical and monitoring applications but not vehicular use of the three radiacs. A complete test would have to include a more complex and time-consuming test with all three radiacs exercised in tactical, monitoring and vehicular scenarios.

Non-concur: Other issues specifically address the vehicular capability of the VDR-1. Neither the AN/PDR-27() nor the IM-174 have a vehicular capability to test. The two referenced issues were included to specifically evaluate the hand-held employment of the VDR-1 in comparison with the other two systems. In spite of the VDR-1 being developed for vehicular use, the TM will accord it a hand-held role in which troops will attempt to use it. Therefore, this role will be tested.

(2) Comment: Para 5.0 w. "Delete T+120. Add the words 'see note'. Add the following note under milestone w - Special IPR: 'Note: A production decision is required by the Special IPR by 31 Dec 80, in order for the government to authorize the contractor to proceed, and produce and deliver VDR-1's to meet the program IOC date of Oct 81.' Reason: An accelerated schedule of Test Reports and Evaluation is necessary to reach a timely IPR decision. That decision is required by 31 Dec 80 if deployment of units to USAREUR is to begin in Oct 81 for IOC."

Non-concur: OT IIA is to occur between 6 Oct and 28 Nov 80. Attempting to hold a Special IPR by 31 Dec 80 is impractical. IAW TRADOC Reg 71-9 and AR 71-3, the test board has 30 - 60 days to complete the test report, USACMLS has 30 - 60 days to write the IER, and the members of the IPR have 30 days to review the IPR Package. Attempting to compress five months' work into one is impractical.

2. Total requested changes: 23
Total concurred with: 20
Total non-concurred with: 3

SUPPLEMENTARY

INFORMATION

DEPARTMENT OF THE ARMY
US ARMY MILITARY POLICE AND CHEMICAL SCHOOLS/
TRAINING CENTER AND FORT MCCLELLAN
FORT MCCLELLAN, ALABAMA 36205

REPLY TO ATTENTION OF

AD-A081 804

ATZN-CM-CDT

23 JUN 1980

SUBJECT: Change Two to the Independent Evaluation Plan (IEP) for OT IIA of Radiac Set AN/VDR-1( )

SEE DISTRIBUTION

1. Reference:

a. USA Chemical School letter, ATZN-CM-CDT, 2 April 1980, subject: Change One to the IEP for the OT IIA of Radiac Set AN-VDR-1( ) with TRADOC First Indorsement, ATCD-TM, 12 June 1980.

b. USA Chemical School letter, ATZN-CM-CDT, 25 January 1980, subject: Request for TRADOC Approval of IEP for OT IIA of Radiac Set AN/VDR-1( ).

. Make the following page for page substitutions:

REMOVE PAGE	ADD PAGE
2	2
5	5
-	13a
22	22

3. Reference b, when modified by reference a and this letter constitute the TRADOC approved IER for the OT IIA for the AN/VDR-1( ).

4. Post this cover letter to the front of the subject IEP.

5. POC is CPT Steven Wade, AV 865-5267/4210.

FOR THE COMMANDANT:

Richard A. Hickey, LTC

WALTON A. PHILLIPS
Colonel, CmlC
Assistant Commandant
US Army Chemical School

1 Incl
as

23 JUN 1980

ATZN-CM-CDT

SUBJECT: Change Two to the Independent Evaluation Plan (IEP) for OT IIA of Radiac Set AN/VDR-1( ).

DISTRIBUTION:

Commander, US Army Training and Doctrine Command, ATTN: ATCD-C, ATCD-T, ATCD-S, ATCD-Z, Ft Monroe, VA 23651
Commander, US Army Operational Test and Evaluation Agency, ATTN: CSTE-PON, 5600 Columbia Pike, Falls Church, VA 22041
Commander, TRADOC Combined Arms Test Activity, ATTN: ATCAT-OP-P, Ft Hood, TX 76544
Commander, US Army Combined Arms Center and Fort Leavenworth, ATTN: ATZLCA-DM, Ft Leavenworth, KS 66027
Commander, US Army Logistics Center, ATTN: ATCL-FT, Ft Lee, VA 23801
Commander, US Army Administration Center and Ft Benjamin Harrison, ATTN: ATZI-PI, Ft Benjamin Harrison, IN 46216
Commander, US Army Test and Evaluation Command, ATTN: DRSTE-CT-T (Mr. Kadel)
US Army TRADOC LO, Aberdeen Proving Ground, MD 21005
Commander, US Army Signal Center and Ft Gordon, ATTN: ATSN-CD-TE, Ft Gordon, GA 30905
Commander, US Army Nuclear and Chemical Agency, ATTN: MONA-SAL, 7500 Backlick Road, Bldg 2073, Ft Belvoir, VA 22060
Director, US Army Materiel Systems Analysis Activity, ATTN: DRXSY-RE, Aberdeen Proving Ground, MD 21005
Director, US Army TRADOC Systems Analysis Activity, ATTN: ATAA-CD, White Sands Missle Range, NM 88002
Director, US Army Combat Surveillance and Target Acquisition Laboratory, ATTN: DELCS-K (Mr. Leonard), Ft Monmouth, NJ 07703
Defense Documentation Center, Cameron Station, ATTN: DDC-TCA, Alexandria, VA 22314
President, US Army Armor and Engineer Board, ATTN: ATZK-AE-TA, Ft Knox, KY 40121

*2.1.1 ISSUE: Is the system capable of being operated by the individual soldier?

2.1.1.1 SCOPE: Testing will assess the operator's ability to read the meter while performing radiological survey and monitoring in a realistic operational environment. A baseline comparison against both the IM-174A/PD and AN/PDR-27() should be made.

2.1.1.2 CRITERIA: Ease of operation includes manipulation of all controls and associated accessories, removal from packing, preoperational tests, user operator tests and maintenance tests.

2.1.1.2.1 The system shall be significantly easier to operate and be maintained by the individual soldier in normal combat clothing than both the IM-174A/PD and AN/PDR-27( ).

2.1.1.2.2 The system shall be significantly easier to operate and be maintained by the individual soldier while in full chemical protective clothing, gloves and mask than both the IM-174A/PD and AN/PDR-27( ).

2.1.1.2.3 The design of the system shall facilitate a simple check of the workability (go-no-go) of the equipment.

2.1.1.3 RATIONALE: Military items must be operated and maintained by soldiers under both normal combat and NBC warfare conditions.

2.1.1.4 SOURCE: QMR, para 3a, 9f, 10a and 10b.

*2.1.2 ISSUE: Are the dials and controls located on the ratemeter so as to be easily reached and used?

2.1.2.1 SCOPE: Testing will assess whether or not test soldiers can manipulate the controls under tactical conditions while both normally clothed and in chemical protective clothing, mask and gloves.

2.1.2.2 CRITERIA:

2.1.2.2.1 Dials and controls shall be integral with the ratemeter.

2.1.2.2.2 Dials and controls shall be easy to reach and use.

2.1.2.2.3 Dials and controls sh[illegible] of a location, size, shape, and arrangment to allow use with che[illegible]rotective clothing, mask and gloves.

2.1.2.3 RATIONALE: Soldiers must be able to manipulate the controls while both in and out of chemical protective clothing, mask and gloves to survive in a combat environment.

*Critical issues

2.1.6.3 RATIONALE: The system must be designed so as not to interfere with other critical operations inside the vehicle.

2.1.6.4 SOURCE: QMR, para 8b(9) and 8b(10); USAOCCS IER, Aug 78, page B-2, item 7.

*2.1.7 ISSUE: Is adequate mounting hardware provided?

2.1.7.1 SCOPE: Mounting hardware will be verified as fitting the following vehicles: M113, M60A1/A3, M151A2, M577, XM1, XM2, and M880.

2.1.7.2 CRITERIA:

2.1.7.2.1 Mounting hardware shall be provided for mounting the radiac set in tactical vehicles.

2.1.7.2.2 The number of different mounting hardware items used in different types of vehicles shall be the minimum possible, eg., the ideal is for a universal mount for all vehicles.

2.1.7.3 RATIONALE: Mounting prevents abuse during vehicular surveys and other transportation. Also, the driver can be the operator if the system is mounted in the vehicle.

2.1.7.4 SOURCE: QMR, para 8b(6).

*2.1.8 ISSUE: Does the mounting system facilitate mounting and dismounting of the system?

2.1.8.1 SCOPE: Testing will measure the length of time to mount (also to remove) the system from its mounting brackets when operator is in normal combat clothing as well as in full chemical protective clothing.

2.1.8.2 CRITERION: The system shall be capable of being easily mounted onto or disconnected from the mounting brackets in tactical vehicles within:

2.1.8.2.1 One minute by personnel in normal combat clothing.

2.1.8.2.2 Three minutes by personnel in full Mission Oriented Protective Posture (MOPP level 4).

2.1.8.3 RATIONALE: Installation and removal of the system from vehicles should be simple and easy to perform. The utility of the system is greatly enhanced if shifting from a vehicle mounted to a man portable mode is easy and quick.

2.1.25 ISSUE: Is the carrying pouch for the AN/VDR-1 adequate?

2.1.25.1 SCOPE: Testing will determine the adequacy of storage facilities for the AN/VDR-1 and its components/accessoried and the ability of the carrying pouch to protect the equipment when in use, when in storage or when being carried/transported.

2.1.25.2 CRITERIA:

2.1.25.2.1 There must be sufficient storage compartments in the carrying pouch to store the AN/VDR-1 and all its authorized components/accessories.

2.1.25.2.2 The storage compartments will be large enough and strong enough to adequately accomodate and protect the AN/VDR-1 and its components/ accessories during normal usage.

2.1.25.2.3 The storage compartments will be easily accessible.

2.1.25.2.4 The storage compartments will not allow components/accessories to be lost from the carrying pouch during normal usage.

2.1.25.3 RATIONALE: To be militarily useful, the carrying pouch for the AN/VDR-1 must be large enough to accomodate and protect the equipment including all components/accessories during normal usage. This includes positive protection from loss, protection from damage due to the equipment being carried or stored, and having the components/accessories easily accessable during normal operations.

2.1.25.4 SOURCE: OT II Test Report on the AN/VDR-1 Radiac Set.

2.9.1.2.2 Operating personnel shall be adequately protected against high voltage.

2.9.1.3 RATIONALE: Military equipment should be as safe to operate and maintain as possible.

2.9.1.4 SOURCE: QMR, para 8e and 10c.

2.10 TRAINING:

*2.10.1 ISSUE: Can the representative soldier perform the critical operational and tactical tasks with appropriate skills, knowledge, motivation, and appreciation of the system's capabilities and limitations to the prescribed standard?

2.10.1.1 SCOPE: The proposed tactical training system elements and procedures developed by TRADOC proponent school will be analyzed during pretest training by evaluating test players' performance prior to training transfer/effectiveness and applicability of required critical tasks in both unit and institutional environments will be assessed. Requirements of the proposed training system in terms of time (to include extra time required for players to achieve desired performance levels), personnel, media, and other assets will be recorded for COEA/CTEA purposes. The tactics employed by the test players should be observed to ascertain that they are employing equipment correctly and not degrading the capability of the equipment. This is measured and compared to the ARTEP/revised ARTEP standards.

2.10.1.2 CRITERIA:

2.10.1.2.1 Upon completion of tactical training, as outlined in the ICTP, all of the test players will be able to perform all of the operational/tactical tasks to standards identified in either SQT type test or ARTEP without increasing training time, instructors or training material compared to training on the IM-174A/PD and AN/PDR-27( ) combined.

2.10.1.2.2 Upon completion of training, test players will be able to operate the AN/VDR-1 to 100 percent of the designed equipment capability under simulated nuclear warfare conditions.

2.10.1.3 RATIONALE: The AN/VDR-1 should not require unacceptable increases in training requirements over the two systems it is to replace.

2.10.1.4 SOURCE: TRADOC Reg 71-9.

3.0 CONCEPT OF EVALUATION

3.1 EVALUATION PROCEDURES