LEAFLET 8

RADIATION DETECTION AND MONITORING EQUIPMENT

CONTENTS

Para

Table Page

Annex

RADIATION DETECTION AND MONITORING EQUIPMENT

SCOPE

1 Radiation Detection and Monitoring Equipment (RDME) is split into three categories:

1.1 RDME used for Health and Safety (H&S) and Nuclear Accident Response Organisation (NARO) is identified in this leaflet as RDME(H&S)

1.2 RDME(MED&DENT) used in support of medical, dental and veterinary equipment testing should be managed in accordance with JSP473 Joint Service Regulations For The Engineering Support Of Medical, Dental And Veterinary Equipment. JSP473 outlines the policies and procedures to be adopted in the inspection and maintenance of medical equipment used by the UK Armed Forces and its Agencies.

1.3 RDME used to meet operational war fighting requirements is identified in this leaflet as RDME(OP).

2 All equipment provided for the purpose of carrying out radiation detection and monitoring of ionising radiation for personal protection is required to be properly maintained, thoroughly examined and tested annually and have its performance established in tests before it is taken into use for the first time. (Ref. Ionising Radiations Regulations 1999 (IRR99) Regulation (19)).

3 This leaflet describes the selection, testing, maintenance, repair and support of such equipment.

4 JSP 425, the Examination and Testing of Ionising Radiation Monitoring (Including Protection) Instruments, details the minimum requirements for examination and testing of ionising RDME. It also describes the minimum standards to be maintained by Calibration Facilities to ensure that the employer's responsibilities under IRR99 Regulation (19) are achieved.

5 Sufficient RDME shall be provided to meet the requirements of the radiation monitoring programme. In addition, permanently installed RDME should be positioned in areas where high radiation dose rates (typically 1 Svh^{-1}) may occur, as advised by the Radiation Protection Adviser (RPA).

6 RDME(OP), formally identified as RADIAC equipment, is scaled in centiGray (cGy) and should not be used for radiation protection purposes, unless advised by the RPA.

STATUTORY REQUIREMENTS AND PARALLEL ARRANGEMENTS

7 In addition to the general requirements of the Health and Safety at Work etc Act 1974, the following specific legislation applies directly:

- Ionising Radiations Regulations 1999 (IRR 99) (applies directly).
- Ionising Radiation (Medical Exposure) Regulations 2000 (IRMER2000)

DUTIES

Commanding Officer and Head of Establishment (HoE)

8 The Commanding Officer/Head of Establishment (CO/HoE) has a duty to the Secretary of State, and a personal responsibility, to protect the environment and to secure the health, safety and welfare of their staff at work. The CO/HoE is required to protect persons not in MOD employment against risks to their health or safety arising from the MOD work activities (eg the general public). This includes radiation safety. The CO/HoE's authority (but not responsibility) for radiation safety management arrangements may be delegated to appropriate personnel, such as a Radiation Safety Officer (RSO).

9 Newly arising activities involving the use of ionising radiation must be covered by suitable and sufficient Prior Risk Assessment (PRA). A PRA should be in place prior to initiation of work. (Ref. Leaflet 2)

Radiation Safety Officer (RSO)

10 The Radiation Safety Officer (RSO) shall ensure all areas under their supervision have appropriate risk assessments for the RDME (including instrument check sources) they hold. The RSO may be required to liaise with the RPS, IPT, RPA and other stakeholders in obtaining suitable and sufficient risk assessment coverage (Ref. Leaflet 2).

Radiation Protection Supervisor (RPS)

11 An RPS must be appointed (where it is necessary) to designate controlled or supervised areas. Where an RPS is appointed, their duties shall include obtaining/preparing sufficient risk assessments/contingency plans for works involving the use of ionising radiation, the RPS may not be expert in such matters and may obtain assistance from the relevant IPT, RSO or RPA. (Ref. Leaflet 2)

Workplace Supervisor (WPS)

12 In units where it is unnecessary to appoint an RPS, a WPS may need to be appointed with duties to ensure that work is carried out in accordance with local orders for radiation safety (Ref. Leaflet 16). In addition to those duties, a WPS may be required to assist in the preparation of risk assessments and contingency plans.

Qualified Person (QP)

13 The CO/HoE of an establishment operating a Radiation Calibration Facility is to appoint in writing one or more QPs to carry out or supervise the testing of RDME in accordance with the IRR99. The qualification and training requirements for Qualified Persons are given in JSP 425.

SELECTION

RDME(H&S)

14 The selection of suitable RDME(H&S) should be made on the advice of the RPA.

15 General and specific advice on RDME may be obtained from either the RPA or the equipment sponsor.

16 The approved list of RDME(H&S) is limited to a range of instrumentation adequate for (MOD) defined radiation and detection monitoring purposes. Utilisation of RDME(H&S) from the approved list provides users with the assurance of through life support for the equipment.

17 Suitable RDME(H&S) is defined by the appropriate RPA and endorsed by the Chief Environment and Safety Officer (CESO) or other suitable person. The approved scales and allowances for RDME(H&S) are detailed in the RDME Approved List of Test Equipment (RDME(H&S)-ALTE) which is maintained on behalf of the MOD Radiation Protection Instruments Committee (RPIC) by the CBRN Delivery Team.

18 Where a platform, unit or establishment requires a change to the type or number of RDME allocated, a request providing reasons for the change in allocation must be provided to the relevant RPA for review and CESO endorsement. Following RPA review, the requirement should be submitted to CBRN Delivery Team via the appropriate RPIC representative such that RDME-ALTE amendment action may be initiated.

18.1 For RN units S130 procedures are to be followed for change in RDME scaling.

18.2 For RAF units a TEC application through station TMEC is to be used for change in RDME scaling.

18.3 For Army units form AF8088 procedures are to be followed for change in RDME scaling.

RDME (OP)

19 The capability for operational use is defined by DEC(CBRN) with the tables of scales and allowances to support operations detailed in JSP 336 and specifically for the Royal Navy Surface Fleet in BR 2170(3) and Royal Navy Submarine Fleet in BR2170(4).

USE

20 RDME used for monitoring operations shall only be operated by personnel who have been trained in their operation and are aware of the capabilities and limitations of the equipment.

PROCUREMENT

General Requirements

21 During the procurement phase, the following requirements shall be incorporated into the contract of purchase by the sponsoring CBRN Delivery Team. It is the supplier's responsibility to ensure all of the requirements are met:

21.1 Type Test data;

21.2 Before First Use certificate in accordance with JSP 425;

21.3 A calibration protocol in accordance with JSP 425.

22 It is the responsibility of the sponsoring Delivery Team or equipment manager to provide newly procured RDME with the following:

22.1 Spares to support repair;

22.2 Jigs and sources, if special items are required, for testing and operational checks;

22.3 Test procedures (usually obtained from instrument suppliers);

22.4 Suitable instrument check sources. If an instrument check source is to be supplied a PRA is also to be provided (Ref. Leaflet 2) and relevant details published in JSP 515.

23 RDME is not to be introduced unless details of the equipment's performance, limitations and accuracy relevant to the proposed use of the equipment are provided.

RDME(H&S) Equipment Requirements

24 RDME(H&S), with the exception of site specific special monitoring equipment, is managed by the DE&S CBRN Delivery Team, in consultation with the relevant CESO, RPA and the RPIC.

25 Where there is a specific requirement for equipment not on the approved list, a request for new equipment is to be submitted to the relevant RPA for consideration and approval. The request is then forwarded to the relevant CESO for endorsement. CESO will arrange procurement with the equipment sponsor normally via the RPIC and CBRN Delivery Team.

26 MOD units and establishments with a resident RPA may purchase special/specific to type RDME following RPA approval. In such instances the procuring unit/RPA will become the equipment sponsor and must ensure provision for subsequent support activities is maintained in line with guidance detailed in this leaflet.

RDME(OP) Equipment Requirements

27 New RDME(OP) requirements are managed by the DE&S (CBRN Delivery Team), as directed by DEC(CBRN) capability requirements.

28 Tri-service, land environment specific (such as Tactical Radiation Monitoring Equipment (TRaME)) and sea environment specific (such as Ships Installed RADIAC System) RDME(OP) are provided with in service support from the CBRN Delivery Team.

TESTING

29 RDME testing shall be carried out in accordance with JSP 425 "The Examination and Testing of Ionising Radiation Detection and Monitoring Equipment".

30 Where contracted calibration coverage is not supplied by the supporting IPT, Platforms, units and establishments are responsible for arrangement of annual RDME testing. All testing shall be undertaken by an approved calibration facility, details of which are provided in paragraphs 46 – 51.

31 Specific arrangements for RAF and Army units and establishments holding RDME(H&S) have been made as follows:

31.1 Annual testing is carried out through Dstl ESD Calibration Facility where a pool of RDME and appropriate spares is held. The work is carried out under the CBRN Delivery Team RDME Support contract with Dstl ESD.

31.2 The Tri-Service RDME Support contract uses the MOD Form 1773 process for the notification of equipment due for calibration. The contractor will raise and issue the MOD Form 1773 for the complete list of RDME held at unit in accordance with their calibration database and will issue the MOD Form 1773 to the unit (or supporting unit) four weeks prior to the month of calibration.

31.3 The unit will receive the form completed including Urgency of Need (UON) and Direct Exchange Return codes. These will have been predetermined by the contractor dependent upon current availability and status of equipment held within the pool and will normally be UON of ROUTINE with a maximum turn around time of 14 days. Units wishing to amend the UON or Direct Exchange Return codes are to notify the Support Authority stating the reasons for change, authorised by the unit Qualified Person.

31.4 Other than the exception stated above then the standard MOD Form 1773 procedure applies. Both Direct Exchange and Loan Cal equipment is to be returned to the Calibration Laboratory as detailed on the MOD Form 1773.

31.5 The maintenance policy for RAF units and establishments RDME(H&S) is contained in AP112G-1300-2R1.

32 RDME sent to calibration facilities must include all accessories, individual instrument check sources and leads. They must be:-

32.1 accompanied by the appropriate instrument log form RN - S/D 1956, RAF/Army RAF Form 4021 R/1.

32.2 certified as not being contaminated above levels that would require radiation protection controls to be implemented as agreed with the RPA and calibration facility.

32.3 transported in accordance with Leaflet 10 and meet the surface contamination requirements at 32.2 above where an instrument check source is included as part of the equipment.

33 Technical queries about RDME should be directed in the first instance to the Equipment Sponsor or the RPA.

34 Testing difficulties arising from the design of RDME are to be referred initially to the equipment sponsor. Generally this will be CBRN Delivery Team, MoD Abbey Wood.

Test Categories

35 The testing of RDME is broken down into three categories. These categories are fully detailed in JSP 425, but are summarised as follows:

Category One (test before first use).

36 This test should be carried out by the instrument manufacturer or an approved calibration facility. The purpose of this test is to compare instrument performance characteristics with type test data. It must be undertaken before the instrument is brought into service or following a repair that may have altered the instrument's response.

37 The test is detailed in the MOD Radiation Calibration Qualified Persons (MRCQP) Calibration Protocol Manual.

38 Category One tests must be carried out by or under the direct supervision of a Qualified Person. (Ref. JSP 425).

Category Two (periodic / annual test).

39 This test should be conducted periodically (at least annually) to confirm that the performance of the instrument has not deteriorated, advice should be sought from the RPA. The test is to be carried out by an approved calibration facility.

40 The test is detailed in the MRCQP Calibration Protocol Manual.

41 Category Two tests must be carried out by or under the direct supervision of a Qualified Person. (Ref. JSP 425).

Category Three (test before each operational use – functional check).

42 For the majority of RDME the test is detailed in the instrument operator's manual, which is usually in the form of a BR for RN, AP for RAF or AESP for the Army.

43 The RPA is to be consulted on the type and frequency of routine checks to be undertaken to meet both local and legislative requirements.

44 The user should carry out a functional check before operational use. The functional check should as a minimum include the following:

44.1 Battery check

44.2 Physical condition

44.3 Calibration in-date

44.4 Validity of seals

44.5 Response to an instrument check source, if supplied. This check provides confirmation to the user that the instrument responds to radiation to a degree consistent with that obtained during the periodic/annual tests.

44.5.1 The acceptable range of readings for the instrument check source is shown on the instrument calibration certificate. Local procedures should include the requirement to confirm a consistent response to a test source before each use. Demonstration of best practice would include making and retaining a record of such checks for two years.

45 Further advice should be sought from the equipment sponsor or RPA.

Approved MOD / Defence Contractor Radiation Calibration Facilities

46 For the purposes of this leaflet an Approved MOD / Defence Contractor Calibration Facility will be referred to as an approved calibration facility.

47 The minimum facilities, equipment and standards to be achieved by an approved calibration facility are fully defined in JSP 425.

48 A calibration facility demonstrating compliance with JSP 425 will be nominated as an approved calibration facility by the MRCQP Committee. Chairman of the MRCQP Committee maintains the list of approved calibration facilities and this is attached at Annex A.

49 If a non approved calibration facility is to be used then assurance must be provided that the calibration work undertaken is:

49.1 Traceable to National Standards

49.2 Accredited to an appropriate MOD recognised quality management standard, normally ISO 9002 Series Quality Management Standard.

49.3 The facility has been accessed and meets the requirements of BS EN ISO 17025.

49.4 The RDME is calibrated, as a minimum, in accordance with the relevant protocol in the MRCQP Calibration Protocol Manual.

50 CBRN Delivery Team are to be informed prior to work being undertaken at non-approved calibration facilities.

51 All approved calibration facilities will be audited by MRCQP against compliance with JSP 425 as a minimum every three years.

DOCUMENTATION

Certificate of Calibration

52 A certificate of calibration for each instrument shall be raised by the approved calibration facility. The certificate layout and contents are detailed in JSP 425 but shall contain as a minimum the following:

52.1 Identification of the equipment e.g. Description, Serial Number;

52.2 The calibration accuracy over its range of operation for the types of radiation for which it will be used;

52.3 Date of test;

52.4 Name and signature of the Qualified Person.

53 A copy of the current certificate of calibration shall be available to the user.

Instrument Log

54 A log containing the particulars of every test and repair for each instrument is to be kept by a Qualified Person.

55 Form S/D 1956 is to be used by Navy and Army units and establishments. RAF Form 4201 R/I is to be used by Air Force units and establishments.

56 The instrument log for equipment managed under the CBRN Delivery Team Tri-Service RDME Contract, e.g. RAF and Army units and establishments, will be maintained and retained by Dstl ESD Calibration Facility.

RECORDS

57 Records of past calibrations are to be maintained by the unit or establishment for the life of the equipment and retained until at least 2 years after last use / disposal.

58 The instrument logs are to be held for a period of at least 2 years from date of last entry by the unit or establishment.

CONTACT DETAILS

59 RDME(H&S), RDME(OP) Equipment Sponsor

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RELATED LEAFLETS

61 Leaflets referred to within this Leaflet are shown in Table 1.

Table 1 Related Leaflets

Leaflet Number	Leaflet Title
2	Risk Assessments and Contingency Plans
10	Transport of Radioactive Material
16	Local Orders for Radiation Safety
21	Instrument Check Source

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LEAFLET 8 ANNEX A

RADIATION DETECTION AND MONITORING EQUIPMENT

Approved MOD / Defence Contractor Radiation Calibration Facilities

Secondary Standard Facilities

Calibration Facility, Dstl Environmental Sciences Department, Alverstoke

Dosimetry and Radiological Metrology Services (Measurement and Calibration) (DRMS(M&C)), AWE Ltd, Aldermaston (formerly DRaStaC)

Tertiary Standard Facilities

Calibration Facility, Dstl Environmental Sciences Department, Alverstoke

Calibration Facility, Fleet Support Ltd, HMNB Portsmouth

DML Calibration Facility, Devonport Royal Dockyard

BNS Calibration Facility, Rosyth Royal Dockyard

Nucleonic Calibration Facility, HM Naval Base Clyde

SMITE, BAE Submarines, Barrow-in-Furness

Nucleonic Calibration Facility, Vulcan NRTE

Calibration Facility, Nuclear Department, HMS Sultan

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