

## Leaflet 6

# Dosimetry and Personal Dose Records, Including Medical Surveillance of Classified Persons

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## Scope

1 This Leaflet is intended to assist line managers and employees within the MOD to comply with current legislation, guidelines and standards concerned with assessing and recording all significant doses of ionising radiation.

## Statutory Requirements

2 In addition to the general requirements of the Health and Safety at Work etc Act 1974 and the Management of Health and Safety at Work Regulations 1999, specific legislation applies directly. There is a statutory requirement for radiation dose assessment and recording to be kept in accordance with the following specific legislation:

- Ionising Radiations Regulations 1999 (IRR99)
- Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPPIR2001) Ionising Radiation (Medical Exposures) Regulations 2000 (IRMER2000)

3 There is a statutory requirement to ensure that all classified persons are certified as fit for their intended type of work and also that arrangements are made for continuing medical surveillance with appropriate records maintained in accordance with the IRR99.

## Duties

### Commanding Officer and Head of Establishment (CO/HoE)

4 The CO/HoE has a duty to the Secretary of State, and a personal responsibility to protect the environment, and secure the health, safety and welfare of their staff at work. The CO/HoE is also required to protect persons not in MOD employment (e.g. contractors and members of the public) against risks to their health and safety arising from the MOD work activities. This includes radiation safety. The CO's authority (but not responsibility) for radiation safety management arrangements including the provision of dosimetry may be delegated to line managers and other appropriate personnel, such as a Radiation Safety Officer (RSO).

5 CO/HoEs are responsible for:

Engaging a suitable Approved Dosimetry Service (ADS) for dose assessment and record keeping;

Making an assessment of all significant doses for personnel designated as classified persons and ensuring that such assessments are recorded;

At the request of a classified person, providing them with a copy of their dose summary or dose record;

Ensuring that outside workers are provided with a current individual radiation passbook and that arrangements are made to ensure that it is kept up to date;

Ensuring that classified persons are provided with a copy of their termination record upon cessation of radiation work or MOD employment;

Retaining a copy of the summary of the dose record received from an ADS for at least 2 years;

Conducting an investigation and reporting the findings to the relevant authorities and ADS after an overexposure or whenever estimated doses or special entries are required;

Ensuring that personal dosimetry is available for classified persons or other persons where appropriate;

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Ensuring that a registered medical practitioner (adequately trained and appointed by the Health and Safety Executive (HSE)), usually a unit or establishment medical officer, is available to carry out the duties of the Appointed Doctor (AD);

Ensuring that personnel who require adequate medical surveillance by an AD or employment medical adviser for the purpose of determining their fitness for work with ionising radiations receive such surveillance;

Ensuring that the AD undertaking medical surveillance is provided with all appropriate information on the personnel they are seeing to allow an appropriate decision on fitness to be made;

Ensuring that a health record is maintained for personnel who require medical surveillance and a copy of that record is retained by the ADS until the person to whom the record relates has or would have attained 75 years of age or at least 50 years (from the date of the last entry) whichever is the later;

Ensuring that employees who have been subjected to an overexposure have their subsequent exposure to radiation adequately managed and that they are informed of the dose limit applicable for the remainder of the calendar year.

### **Radiation Safety Officer (RSO)/Radiation Protection Supervisor (RPS)/Dosimetry Co-ordinators**

6 Radiation Safety Officer/Radiation Protection Supervisor/Dosimetry Co-ordinators are responsible for:

- Ensuring that personnel are provided with the correct dosimetry;
- Completing the dosimetry administration;
- Instructing personnel in the correct method of wearing the dosimetry;
- Promptly notifying the ADS of changes in circumstances.

### **Employees**

7 Employees are responsible for:

- Ensuring that they wear the personal dosimetry whenever they are working with ionising radiation;
- Ensuring that they do not damage or interfere with their own or other employee's personal dosimetry;
- Informing their dosimetry co-ordinator if their personal dosimetry has been lost, damaged or stolen;
- Storing their personal dosimetry securely in a low background area when not in use;
- Attending health surveillance or required medical review.

### **Engaging Suitable Approved Dosimetry Services (ADS)**

8 Dosimetry services are approved by the HSE for one or more of the following specific purposes:

- Measurement and assessment of whole-body or part-body doses arising from external radiation;

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Assessment of doses from intakes of radionuclides;

Assessment of doses following an accident or other incident;

Assessment of intervention doses following a REPIIR accident;

Co-ordination of individual dose assessments, making, maintaining and keeping dose records and the provision of summary information.

9 Line managers at units which employ classified persons must have a Health & Safety Executive ADS for dose assessment and dose record keeping. The RPA can provide advice about the type of radiation exposures that need to be assessed and the types of ADS that are required. Any ADS is to provide clear advice on the use of any dosimeter or other equipment supplied for making measurements and assessing dose. The ADS must be provided with sufficient information about employees to enable assessments to be made and records to be kept.

10 Details of the arrangements which must be made with the ADS are at Annex A.

11 Dstl ADS provides an integrated range of dosimetry services, which are approved by the HSE for assessing and recording dose results. Enquiries about these services can be made by telephoning Portsmouth (023) 9276 8278 or (023) 9276 8130.

## Personal Radiation Monitoring and Assessment

12 Workers carrying out certain types of work or likely to receive exposures in excess of three tenths of any dose limit (see Leaflet 4) are to be designated as classified persons. Details of the requirements for classified persons are given at Leaflet 38 – further information and advice is to be sought from the RPA. Once a person is classified, it is a statutory requirement that radiation exposures of that person are assessed and recorded – for external radiation doses, this normally includes the use of personal radiation dosimeters issued by an ADS.

13 Within MOD, it is normal practice that non-classified persons, entering controlled areas (see Leaflet 4), are also issued with personal radiation dosimeters supplied by an ADS. Non-classified persons must only enter controlled areas under written arrangements (see Leaflet 5). In some cases, however, personal radiation dosimeters are unnecessary – in these cases, the doses must still be assessed by alternative methods which must be specified in the written arrangements. RPA advice must always be sought regarding the arrangements for controlled areas (see Leaflet 7).

14 In addition to the use of personal dosimeters for external radiation exposure, there are a number of other methods of assessing personal dose which may need to be considered, particularly for internal radiation exposure. The choice of method will depend on the circumstances of individual cases, including the nature of the work, the type of radionuclide and ionising radiation involved. Assessment of committed doses arising from intakes of radionuclides into the body generally involves a combination of techniques including: biological sampling, monitoring part or whole of the body using a whole body monitor or personal air sampling.

## Appropriate Dose Assessment Periods

15 Often the dose assessment period will be one month, but longer periods, such as three months, may be appropriate where doses are very low. For external radiation, the choice of assessment period will depend on the dose rates to which employees are exposed, the ability of the dosimeter to measure low doses; the magnitude of the expected dose and stability of the stored image or signal on the dosimeter over time. More frequent assessment will be appropriate where there is a significant risk of accidental exposure. The longer the assessment period the more difficult it becomes to determine when and why an individual's dosimeter has received an unusually high dose in the event of an accident or other incident.

## Supply of Personal Dosimetry

16 Line managers at units and establishments are to inform the Dstl ADS or other ADS by signal, facsimile, telephone or in writing of their requirements for dosimeters. Requests for dosimeters are to be sent to the Dstl ADS or can be made by telephoning (023) 9276 8278 or 9276 8130 or e-mail: [adsenquiries@dstl.gov.uk](mailto:adsenquiries@dstl.gov.uk).

17 A description of dosimetry forms, associated documentation and their function is given in Annex A. Stocks of most of these forms are held by the Dstl ADS.

## Accident and Emergency Doses

18 Under IRR99, when an accident or other occurrence takes place that is likely to result in a person receiving an effective dose (whole body dose) exceeding 6 mSv; or an equivalent dose (eyes, skin, hands etc) exceeding three tenths of the relevant dose limit, immediate arrangements must be put in place for a dose assessment to be made by the ADS. Contingency planning requirements (including the need for accident dosimetry) are included in Leaflet 2 (in cases where dosimetry was not worn, the dose must be assessed by an appropriate means as soon as possible having regard to the advice from an RPA). All reasonably practicable steps must be taken to inform the employee of the result of that assessment and a record of the assessment must be kept until the employee has, or would have, attained the age of 75 or for 50 years whichever is the later.

19 Under REPIR2001 (see Leaflet 3), when a situation necessitates an emergency plan and this plan concludes that it is reasonably foreseeable for an employee to receive an emergency exposure the employer is to, in relation to dosimetry:

Identify those employees who may be subject to emergency exposures;

Provide suitable training to enable those employees to understand the associated risks;

Make arrangements for medical surveillance to be carried out without delay for employees who may have received emergency exposures;

Make arrangements with an ADS for dose assessments of emergency dosimetry for those employees who may potentially receive an emergency exposure (separate to other dose assessment systems in place);

Record separately any dose received during the emergency exposure.

20 In the unlikely event of a nuclear reactor accident at any of the MOD sites, the accident whole body dosimeters (normally thermoluminescent dosimeters (TLDs)), which are worn by all personnel within the Exclusion Zone must be collected and urgently transported to Dstl ADS. The arrangements in place to meet this objective must be clearly stated in local accident orders.

21 Emergency dosimetry (issued for the purposes of assessment of emergency exposures) must also be urgently transported to Dstl ADS. The arrangements in place to meet this objective must be clearly stated in local accident orders. The ADS must send the results of emergency exposure dose assessments within 24 hours to the employer. The employer will send these results onto the AD and the employment medical adviser; or, in the case of a nuclear reactor accident, to the radiation medical specialist (Institute of Naval Medicine (INM)).

22 The ADS is to send the results of accident exposure dose assessments within 8 hours of receipt of the dosimeters at Dstl ADS to the employer. The employer will send these results onto the AD and the employment medical adviser; or, in the case of a nuclear reactor accident, to the radiation medical specialist (Institute of Naval Medicine (INM)).

23 A member of staff from the Dstl ADS is permanently on call and is available to assess any accident/emergency TLDs within two hours notice to ensure timescales in paragraph 22 are met. Dstl ADS can be contacted on (023) 9276 8278 or 9276 8130 during normal working hours and (023) 9276 8020 at all other times.

## **Suspected High Dose**

24 Whenever it is suspected that the wearer of a dosimeter has received a significant unintended whole-body, skin, extremity or eye dose, the dosimeter is to be returned to Dstl ADS for urgent processing. Where practicable, the employer is to provide the Dstl ADS with advance warning by telephone that the dosimeter is being returned. Consideration must also be given to returning a dosimeter to Dstl ADS for early processing, if the results of control dosimetry indicate that the wearer may be approaching the specified investigation levels (see Leaflet 4) or any of the annual dose limits. Such dosimeters are to be accompanied by a copy of their respective Issue Lists with the remarks column of the Issue List annotated accordingly. Furthermore, as a safeguard against irradiation of the dosimeters in transit, the outside of the package used to return either whole body or skin (extremity) TLDs is to be clearly labelled 'CAUTION - RADIATION DOSEMETERS - DO NOT X-RAY'.

25 For suspected high doses the Dstl ADS will normally signal or telephone the results to the unit or establishment on the day of receipt of whole body or skin TLDs at Dstl ADS. Urgent assessment neutron or radon dosimeters will be processed within 7 working days.

## **Assessment of Radiation Dose from Intakes of Radioactive Material**

26 Where a unit or establishment, in consultation with the RPA, decides that it is necessary to routinely measure biological samples from personnel working with unsealed radioactive substances or to carry out whole body monitoring, then written application is to be made to the ADS, usually Dstl ADS. The procedure to be followed is to be agreed by the unit or establishment and the ADS. Dstl ADS routinely undertakes tritium in urine dose assessments as part of a routine assessment of doses to personnel who may be at risk of taking in amounts of tritium during the course of their work.

27 The establishment will receive a report containing the results of assessment of radiation dose resulting from the intake of radioactive material and where appropriate the information will be recorded on the individual's dose record where it is held by the ADS Record Keeping Service, (ADRKS) usually Dstl ADS.

28 If a person's skin becomes contaminated by a radioactive substance which is not readily removable by usual means, or if an intake of radioactive materials into the body is known or suspected, then a local investigation is to be undertaken, involving the RPA, to assess the radiation dose.

29 The line manager of the unit or establishment is to produce a report containing the following information:

A record of the external radiation dose sustained in the incident;

An estimate of the intake or levels of skin contamination and the radionuclide(s) involved;

Results of any biological monitoring tests and/or external body radioactivity monitoring test;

Circumstances of the intake or skin contamination incident and methods of physical surveillance.

## **Radiation Overexposures**

30 Where a radiation overexposure is being investigated, the individual involved must not be allowed to continue working with radiation until the results of the investigation are known. The individual is to be informed of the results of the investigation and assessment.

31 Special medical surveillance is to be carried out where a person has received a radiation overexposure in excess of 100 mSv whole body dose in a year or an equivalent dose at least twice any relevant dose limit. This person is to be referred to the Appointed Doctor, regardless of whether they are a classified person, without delay.

32 A copy of each report of investigations into overexposures is to be forwarded to the ADS, usually the Dstl ADS, for inclusion in the individual's FMed 291A (envelope containing radiation dose records). These records are to be kept indefinitely.

## **Dose Limitation for Overexposed Workers**

33 The dose limitation for the remainder of a calendar year for a radiation worker who has been overexposed in that year and has not been withdrawn from radiation work by the recommendation of the Appointed Doctor, is the proportion of the calendar year remaining from the end of the dose assessment period multiplied by any annual dose limit.

## **Dosimetry Records**

34 Units and establishments are to maintain the following radiation dose records:

An FMed 291A, medical envelope for each classified and non-classified person wearing dosimetry employed at the unit or establishment. The envelope is to contain:

34.1.1 Radiation Dose Record Summaries;

34.1.2 FMed 291E - copies of personal details forms;

34.1.3 Copies of results of any internal dose assessments;

34.1.4 Copies of reports of investigations made;

34.1.5 FMed 291F Health Record;

34.1.6 Transfer records;

34.1.7 Copies of the results of dose assessments of personal dosimeters issued by an ADS;

34.1.8 Copies of the results of assessment doses received while working under written arrangements and while not wearing dosimeters issued by the establishment ADS, usually the Dstl ADS;

34.1.9 Copies of FMed 291C – Radiation Medical Examination Record;

34.1.10 National Registry for Radiation Workers (NRRW) Opting out notification (where applicable see paragraph 44).

Where appropriate maintain a radiation passbook for classified persons if employed as an outside worker;

Laboratory Certificates issued by the ADS, usually the Dstl ADS, for each person, including visitors and classified persons and non-classified persons, who have worn a dosimeter at the unit or establishment at any time during the previous two years;

Dose assessments by personal dosimeters issued by an ADS, for workers who are not classified persons;

Any assessments of doses of non-classified persons working under written arrangements;

Any assessment of biological samples provided by classified persons or non-classified persons. If an FMed 291A has been raised it is to contain copies of these assessments.

35 A PD2 label (available on request from Dstl ADS) should be clearly visible on the front of an individual's central personnel file and on their FMed 291A dosimetry record (in the case of uniformed personnel, their personal medical documents). The PD2 label is used to readily identify that the individual has been employed as a classified person and will ensure that a termination record is raised at cessation of MOD radiation employment.

## Outside Workers

36 MOD classified persons required to carry out services in a controlled area designated by another employer are referred to as outside workers. Similarly, when classified persons who are not employed by the MOD are required to enter a MOD designated controlled area, the non-MOD classified person would be the outside worker. Line Managers are to seek advice from the RPA on the circumstances in which classified persons should be designated as outside workers. The responsibilities and duties of the outside worker, their employer and the operator of the controlled area must be formally agreed before any work is undertaken.

37 Any employee who fulfils the criteria for outside workers will need an approved radiation passbook. These can be obtained from the ADS, usually Dstl ADS. The radiation passbook is to be kept up to date at all times by the persons authorised by the ADS or employer.

38 Units and establishments that allow outside workers of other employers to enter or work in their controlled areas will need to provide quick and simple estimates of the doses they receive while working in those controlled areas and arrange to enter those estimates in radiation passbooks as soon as practicable.



## **Compensation Scheme and Counselling Scheme**

39 The MOD is a member of The Compensation Scheme for Radiation Linked Diseases (the Scheme). The Scheme provides an agreed method of determining whether compensation should be paid in relation to MOD radiation workers who have developed certain types of cancer or cataracts which may be linked with exposure to ionising radiation at work.

40 The Scheme is entirely voluntary; claimants can choose whether to use the scheme or to take legal action. The use of the Scheme is recommended by the trade unions. Potential claimants may apply through the appropriate trade union or (as with Armed Services Claimants) to the Compensation Scheme Executive Secretary, B582/1FS, British Nuclear Group, Sellafield, Cumbria, CA20 1PG (Tel: 01946 774716). It should be noted that former service men and women are also entitled to apply to the Veterans Agency, though any award would take account of compensation received from other sources. The address is: Service Personnel & Veterans Agency (SPVA), Norcross, Blackpool, FY5 3WP (Helpline: (UK) 0800 1692277, (abroad) +44 1253 866043).

41 All MOD radiation workers, former radiation workers and their families who have concerns about health effects arising from their exposure to radiation during MOD employment are eligible for counselling and may obtain radiation dose summaries. Radiation workers who do not want counselling but wish to obtain a summary of their radiation exposure may also do so under these arrangements. Counselling will provide an opportunity to discuss concerns with someone medically qualified to advise. The counselling does not involve any medical examination, or any form of medical surveillance or screening.

## **National Registry for Radiation Workers (NRRW)**

42 The NRRW database is maintained by the Public Health England. Arrangements have been made for radiation workers in HM Forces and MOD civilian employees in possession of a National Insurance Number to participate in the NRRW, subject to security safeguards and the right of an individual to opt out.

43 Annex D provides an explanation of the arrangements for participating in the NRRW scheme, and a copy is to be given to each radiation worker whether Service or civilian personnel on commencement of radiation work. Any radiation workers may, if they wish, choose not to join the NRRW, otherwise at the end of the calendar year their name and information listed in Annex D will be made available to the NRRW.

44 Individuals wishing to opt out of the scheme are to write to their CO who will forward their request together with the individual's Personal Dosimetry (PD) number to Dstl ADS within 2 weeks of its receipt. Copies of requests to opt out will be incorporated in the individuals FMed 291A (radiation history envelope).

## **Medical Surveillance and Appointed Doctor**

45 COs of units where classified persons are employed or where employees, classified or otherwise, have received an overexposure or where employees are engaged in work with ionising radiation subject to conditions imposed by an AD must ensure that they have a registered medical practitioner available to carry out the duties of the AD.

46 The CO must ensure that each of the employees described above is under adequate medical surveillance by an AD for the purposes of determining the fitness of each employee for the work with ionising radiation which they are to carry out. Adequate medical surveillance, taking into account the nature of the work and the individual's state of health, includes:

A medical examination before first being designated as a classified person;

Periodic health reviews at least once per year;

Special medical surveillance of an employee when a relevant dose limit has been exceeded;

Determination of whether specific work conditions are needed;

A review of health after cessation of work where this is necessary to safeguard the health of the individual;

A special medical examination for any person exceeding an effective dose of 100 mSv in a year or an equivalent dose of twice any relevant annual dose limit.

47 Only persons certified fit for radiation work by the signed entry of the AD in the health record within the preceding 12 months (+ or – 1 month) are to be employed as classified persons. Where the AD certifies that an employee should be subject to certain conditions, the CO must ensure that work is carried out in accordance with those conditions.

48 The AD must, in the UK, be appointed by the Senior Medical Inspector (SMI) at the HSE area office. The HSE certificate of appointment specifies the site or undertaking for which the appointment is valid. The AD does not necessarily have to be employed permanently at the site. More than one doctor may be appointed by the HSE for any particular site.

49 MDG(N), DGAMS and DGMS(RAF) will provide details of the appropriate AD for any particular location. All appointments are to be notified to the appropriate single service Medical Directorates. The tri-service focal point for all radiation medicine issues is located at the Institute of Naval Medicine. The focal point can be contacted on 023 9276 8085 or 9276 8026 during normal working hours and 023 9276 8020 at all other times.

50 The minimum requirement to satisfy the relevant SMI is attendance on a one day course covering the IRR99, the health effects of ionizing radiations and the practical aspects of providing medical surveillance to a syllabus set out by the HSE. The tri-Service Senior Medical Officers' Radiation Medicine Course and the Appointed Doctors one day course cover this syllabus. Course details and application for attendance are to be addressed to the tri-Service focal point.

51 Outside the UK, doctors who would otherwise require appointment are to receive the same information, instruction and training.

52 Detailed guidance on medical surveillance is provided at Annex E.

## Record Retention Periods

53 IRR99 specifies retention periods for certain records. At the end of the listed periods, an assessment on the relevance of retaining the records should be made in conjunction with the requirements of JSP392 Volume 1 Chapter 3 and JSP441 Defence Records Management Policy & Procedures. Record retention periods are as follows:

Table 1 Radiation Dosimetry Record Retention Periods

Management of Radiation Protection in Defence

<b>RECORDS</b>	<b>ESTABLISHMENT*</b>	<b>ADS</b>
ADS issued Laboratory Certificates	2 years	Indefinitely (MOD Policy)
Radiation Dose Record Summary for non-classified person	2 years from the end of the calendar year to which the summary relates	Indefinitely (MOD Policy)
Radiation Dose Record Summary for classified person	2 years from the end of the calendar year to which the summary relates	Retained until worker attains, or would have attained 75 years or for 50 years, whichever is longer
Record of investigations carried out to make special entries in the dose record	2 years	Indefinitely (MOD Policy)
F.Med 291F Health Record	Retained until worker attains, or would have attained 75 years or for 50 years, whichever is longer	Retained until worker attains, or would have attained 75 years or for 50 years, whichever is longer
Termination Record	Copy provided to employee on leaving MOD employment	Retained until worker attains, or would have attained 75 years or for 50 years, whichever is longer
F.Med 291A and contents for classified persons	Retained until employee leaves establishment or MOD employment and forwarded to next unit or ADS	Retained until worker attains, or would have attained 75 years or for 50 years, whichever is longer
F.Med 291A and contents for non-classified persons	Retained until employee leaves establishment or MOD employment and forwarded to next unit or ADS	Indefinitely (MOD Policy)
Over exposure reports	2 years	Not applicable
Warning reports	2 years	Not applicable
Dose assessment made as a result of an accident or incident	Retained until worker attains, or would have attained 75 years or for 50 years, whichever is longer	Retained until worker attains, or would have attained 75 years or for 50 years, whichever is longer
Radiation Passbooks	Retained until employee leaves establishment or MOD employment and forwarded to next unit or ADS	Retained until worker attains, or would have attained 75 years or for 50 years, whichever is longer
Local dose assessments for non-classified persons using dosimeters not issued by the ADS	Indefinitely (MOD Policy)	Indefinitely when passed to the ADS (MOD Policy)

\*NOTE

Records retained by the ADS until worker attains, or would have attained 75 years or for 50 years are actually retained indefinitely (MOD Policy)

## Related Leaflets

54 Leaflets referred to within this Leaflet are shown in Table 2.

Table 2 Related Leaflets

<b>Leaflet Number</b>	<b>Leaflet Title</b>
2	Risk assessments
3	Introduction and use of radioactive substances and radiation generators
4	Restriction of exposure to radiation
5	Written arrangements for non-classified persons entering controlled areas
7	Radiation protection adviser consultation and advisory visits
38	Classified persons and outside workers
39	Radiation safety duties of employees
40	Contingency plans

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## Leaflet 6 Annex A

# Guidance for Line Managers and Employees on Types of Dosemeter, Dosemeter Care, the Administrative Arrangements for Dosimetry Supply, the Associated Dosimetry Records and Medical Documents

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- 20 Dosimeter wear
- 21 Care of radiation dosimeters
- 24 Lost or damaged dosimeters
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- 27 Issue and return of dosimeters
- 32 Completion of the Dstl ADS dosimeter issue list
- 34 Issue of Dstl ADS dosimeters to personnel in receipt of dosimeters issued by another employer
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- 36 Notification of changes in circumstances
- 38 Completion of radiation work at an establishment
- 40 Description of Dstl ADS forms and associated medical forms and documents

### Table

- A1 Period of wear for personal dosimeters

## Introduction

1 Dstl ADS Record Keeping Service (ADRKS) is approved by the Health & Safety Executive (HSE) under the terms of the Ionising Radiations Regulations 1999 (IRR99). The scope of the services provided is summarised below:

### For Classified Persons

Dstl ADS will make and maintain dose records in accordance with the requirements of IRR99 and will keep those dose records (or a copy) until the person to whom the record relates has or would have attained the age of 75 years but in any event for at least 50 years from the last entry. The onus is on the unit or establishment to furnish Dstl ADS with completed record keeping registration forms (FMed 291E forms) to initiate this process. These forms will be provided by Dstl ADS.

Following the assessment of personal dosimeters, Dstl ADS will provide summaries (Laboratory Certificates) of the doses assessed. Within six weeks of the end of each calendar quarter, individual Radiation Dose Record Summary reports will be issued for each person monitored during the period.

Dstl ADS will notify the unit or establishment in the form of a warning report when any individual exceeds 30% of any UK statutory dose limit. In addition, a warning report will be issued when any individual exceeds 30 mSv whole body dose in any 5 year period (where individuals have been authorised to use a 5 year dose limit). Dstl ADS will also inform the unit or establishment by a warning report when any assessed individual's annual cumulative whole body radiation dose exceeds 4.5 mSv. For pregnant females, a warning report will be issued when the whole body radiation dose exceeds 0.75 mSv over the declared term of the pregnancy (dose constraint is 1mSv to the foetus).

Dstl ADS will notify the unit or establishment in the form of an over-exposure report when any individual exceeds a legal dose limit as detailed in Leaflet 4. In addition, the unit or establishment will be immediately notified following assessment of an over-exposure by telephone or signal.

If the employer has agreed to participate in the National Registry for Radiation Workers, Dstl ADS will provide the necessary data to Public Health England to service the scheme for their employees.

Upon cessation of radiation employment, the employer must request a termination record from the ADS relating to a person who ceases to be an employee. Dstl ADS will send that record to the employer or individual and a copy to the HSE.

Dstl ADS will, within 3 months of the end of each calendar year, send to the HSE summaries of all individual current dose records for that year.

At the request of HSE, Dstl ADS will provide them with copies of any employee's dose record. Dstl ADS will notify the establishment and the appropriate Top Level Budget (TLB) safety authority (e.g. the CESO for the TLB area) that HSE have made this request.

Where a unit or establishment requires an employee to be designated as a classified person and that employee has records relating to previous radiation employment, Dstl ADS will enter the recorded historical doses on to Dstl ADRKS. The unit or establishment is responsible for providing Dstl ADS with a detailed breakdown of previous radiation exposures.

### **For Other Persons (only applies to personnel with dosimeters issued by Dstl ADS)**

In respect to persons who are not designated as classified persons but are registered with the Dstl ADS, the Dstl ADS will undertake the requirements in paragraphs 1.1-1.6 herein and will notify the unit or establishment when a non-classified person receives an annual cumulative whole body dose exceeding 4.5 mSv or greater. For pregnant females, a warning report will be issued when the whole body radiation dose exceeds 0.75 mSv over the declared term of the pregnancy (dose constraint is 1mSv to the foetus).

For persons such as casual visitors and persons working under written arrangements who are not registered with the Dstl ADS, the assessed doses will be provided on Laboratory Certificates. No Radiation Dose Record Summaries will be issued for these personnel.

## **Commencement of Radiation Work**

2 The following actions are to be taken by the unit or establishment for all persons whose radiation doses are assessed and radiation records maintained by the ADS, usually Dstl ADS:

Submit a fully completed Personal Details Form (FMed 291E) to the ADS. Where appropriate, annotate NEW WEARER - FMed 291E ENCLOSED, PUT ON REGULAR ISSUE in the remarks column of the Dstl ADS Dosimeter Issue List;

Provide the person with a copy of Annex D;

For personnel involved in radiation work with another employer, obtain written details of their radiation dose histories (broken down by year) from their previous employer and forward to the ADS for inclusion on their current dose records. It is essential that as much dose information as possible is forwarded to the ADS. For radiation workers who have been employed as classified persons by their previous employer, the actions specified in paragraph 2.4.3 will fulfil this obligation;

For classified persons commencing radiation work:

2.1.1 If the person is to become a classified person, the employer (CO/HoE) must notify them in writing to that effect;

2.1.2 Arrange for a medical examination, if required, as described in Annex E;

2.1.3 For individuals previously employed as classified persons by a non-MOD organisation obtain a copy of the termination record and forward it to the Dstl ADRKS. The individual should already be in possession of a copy, if not a copy may be obtained either from their previous employer or from:

The Health and Safety Executive  
Central Index of Dose Information  
Public Health England  
Chilton  
Didcot  
Oxon OX11 0RQ

2.1.4 For persons employed as classified persons who wore Dstl ADS personal dosimeters obtain the FMed 291A envelope containing dose records from the previous unit or establishment or from Dstl ADRKS;

2.1.5 For personnel being designated as classified persons for the first time, ensure that a PD2 label is attached to their FMed 291A radiation history record and their central personnel file and, in the case of uniformed personnel, the personal medical documents. This will ensure that a termination record is requested by MOD when they leave MOD employment;

2.1.6 Where appropriate, request a radiation passbook be issued to the individual by Dstl ADRKS if the classified person will be employed as an outside worker (see Annex C).

## Supply of Dosimeters and Personal Dosimetry Forms

3 Units and establishments are to inform the Dstl ADS or other ADS as appropriate, by signal, facsimile, telephone or in writing of their requirements for dosimeters. Dosimeter Issue Lists returned to the ADS may be used for this purpose and these Issue Lists are to contain sufficient information to enable the ADS to anticipate the unit or establishments future dosimeter requirements. It should be noted that information provided on an Issue List returned to the Dstl ADS might not be processed until after a further two issues have been dispatched. Therefore this option is not to be chosen for cases where an immediate change is required.

4 Normally, orders for dosimeters will be treated as monthly standing orders until countermanded. Whenever possible, one month's notice should be given of changes in dosimeter requirements. Issue Lists are to be scrutinised routinely by the unit or establishment to prevent under/over-ordering of dosimeters.



5 Establishments with only non-classified personnel, who wear dosimeters infrequently and irregularly, may by arrangement with Dstl ADS, receive and return dosimeters at specified time periods other than one month.

6 A description of dosimetry forms, associated documentation and their function is given below. Stocks of most of these forms which are required by the user are held by Dstl ADS.

7 Requests for dosimeters, radiation passbooks or dosimetry forms are to be sent to the Dstl ADS, or can be made by telephoning (023) 9276 8278 or 9276 8130 or e-mail [adsenquiries@dstl.gov.uk](mailto:adsenquiries@dstl.gov.uk) .

## **Types of dose assessment provided by Dstl Approved Dosimetry Service**

8 Line managers and employees are to be aware of the types of dosimeter available from the Dstl ADS. However the RPA should provide the advice on which type of dosimeter that is suitable for a particular task. Employees are to be made aware of their duties and responsibilities for the correct method of wear and care of the dosimeters.

9 The Dstl ADS supply:

Whole-body TLDs;

Accident TLDs;

Emergency whole-body TLDs;

Skin/extremity TLDs;

Combined photon and neutron dosimeters;

Personal radon dosimeters;

Environmental radon dosimeters;

Tritium-in-urine sampling kits;

Uranium-in-urine sampling kits;

Whole body monitoring.

10 Instructions are supplied by the Dstl ADS dosimetry section for use of the above dosimeters.

11 Whole-body TLDs contain a 4-element TLD card inserted in to a filtered holder; these are pre-assembled by Dstl ADS. These dosimeters are used to assess personal exposure from  $\beta$ ,  $\gamma$  and X-radiation to the skin; and from  $\gamma$  and X-radiation to the whole body. Instructions for wearing and taking care of whole-body TLDs are given below.

12 Dstl ADS issues two types of whole-body TLD, the Harshaw 8840 and 8814, which are described below:

The 8840 TLD is issued for routine whole-body dose assessment. It has a limit of detection of 20  $\mu$ Sv and is distinguished by the blue stripe on front of the holder;

The 8814 TLD is issued for accident and emergency whole-body dose assessment. It has a limit of detection of 50  $\mu\text{Sv}$  and is distinguished by the white stripe on the front of the holder.

13 Skin/extremity TLDs are provided for assessing personal exposure from  $\beta$ ,  $\gamma$  and X-radiation to the hands, forearms, feet and ankles or to the lens of the eye. Instructions on how to wear the skin TLD are given below.

14 Dstl Combined photon and neutron dosimeters contain a 4-element TLD card and poly allyl diglycol carbonate (PADC) element inserted in to a filtered holder; these are pre-assembled by Dstl ADS. These dosimeters are used to assess personal exposure from  $\beta$ ,  $\gamma$  and X-radiation to the skin; and from  $\gamma$ , X-ray and neutron radiation to the whole body. Instructions for wearing and taking care of whole-body TLDs are given below.

15 Whole-body and skin TLDs can be used for the majority of experimental purposes. Advice can be obtained from the Dstl ADS or the RPA on the suitability of each TLD.

16 Personal radon dosimeters are used to assess personal exposure to radon gas. Environmental radon dosimeters are used to assess radon exposure at work or in service residential accommodation. Instructions on how to wear the personal radon dosimeters are given below.

17 For all practical purposes, doses of radiation are additive and the assessment of personal dose is to include, whenever necessary, the assessment of external dose, and the assessment of dose from any intake of radionuclides into the body.

## Use of Dstl ADS Radiation Dosimeters

18 The RSO or RPS is to ensure that any special instructions issued by the Dstl ADS with regard to the use and care of dosimeters are carried out.

19 Every effort must be made, to prevent wilful or negligent misuse of radiation dosimeters.

## Dosimeter Wear

20 Specific instructions are issued by Dstl ADS on how each of the dosimeters is to be worn:

**Whole Body TLDs.** These dosimeters are used for measuring whole-body dose and are normally to be worn on the front of the chest outside the normal coverall or other protective clothing (this does not include protective lead-rubber aprons). RSOs and RPSs are to instruct and periodically check that users wear the dosimeter correctly with the red window showing the dosimeter number facing towards the body of the wearer.

**Dstl Combined Dosimeters.** These dosimeters are used for measuring whole-body dose and are normally to be worn on the front of the chest outside the normal coverall or other protective clothing (this does not include protective lead-rubber aprons). RSOs and RPSs are to instruct and periodically check that users wear the dosimeter correctly with the window showing the dosimeter number facing away from the body of the wearer.

**Skin/Extremity TLDs.** These dosimeters are to be attached to the relevant extremity or skin area to be monitored. Dedicated rings are provided when they are used to assess doses to the fingers. If tape is used to attach the dosimeter, then care is to be taken to ensure that it does not cover the central part of the dosimeter containing the TLD element.

**Radon Dosimeters.** These dosimeters should either be attached to a helmet (if worn) or to a belt on outer clothing to enable the radon gas to enter the detector.

## Care of Radiation Dosemeters

21 The following precautions are to be taken with all Dstl ADS radiation dosemeters. The individual wearing the dosimeter must:

Wear it properly in the radiation area;

Store it in a low background area, remote from any known sources of ionising radiation when not being worn;

Not shield it in any way. Pens, rulers or other metallic objects may shield the dosimeter;

Not immerse the dosimeter in any liquid. Particular care is to be taken to remove dosimeters from clothing before laundering. Divers are to wrap their dosimeter in two plastic bags and wear the dosimeter inside their wet suit;

Keep the dosimeter away from high temperatures, e.g. pipes and radiators;

Not share the dosimeter with anyone else;

Not damage the dosimeter or holder in any way;

Not carry the dosimeter in close proximity to luminised watches or other luminised articles;

Return the dosimeter promptly at the correct time, ensuring that a replacement is available before giving up the old one, if necessary;

Notify the supervisor, RSO or RPS immediately, if it is lost or mislaid, especially in a radiation area (even if it is later found) as the employer may need to estimate the individual's dose;

Ensure that the dosimeter is not worn inadvertently during medical/dental X-ray examinations.

22 In addition, for whole-body TLDs, consideration is to be given to encapsulating the dosimeter in polythene (approved by the Dstl ADS dosimetry section) whenever the dosimeter is worn in areas where:

Significant contamination exists;

Humid or damp conditions occur;

Corrosive or chemically reactive gases or vapours including tear gas or hydrogen sulphide are present.

23 Radon dosimeters must be kept away from any neutron sources and equipment with high operating voltages.

## Lost or Damaged Dosimeters

24 When dosimeters have been lost, damaged or destroyed during the normal wear period, the unit or establishment is to annotate the Remarks/Changes Required column of the Dosimeter Issue List accordingly. The unit or establishment is to investigate the circumstances of the loss, damage or destruction of the dosimeter and forward an estimate of the dose to the ADS, usually Dstl ADS using ADS Form 94, covering the period that the dosimeter was worn (further guidance on dose investigations is given at Annex B). The estimated dose is to be supported by readings from other dosimeters worn during the period or by documented evidence that would permit the ADS to insert an estimated dose in the record. For example, if there has been no significant change to either the type or frequency of radiation work undertaken by the above personnel during the specified wear period and previous wear periods, an estimated dose may be obtained by averaging the individual's three previous dose results. The unit or establishment is to ensure that any measurements used to estimate dose are recorded and kept for a period of at least two years and take reasonable steps to inform the employee of the dose estimate to be entered on to the dose record. If the lost dosimeter is subsequently found, it must be forwarded to the ADS, usually Dstl ADS, accompanied by an investigation report giving all relevant details. Any previously entered estimated doses will remain in place.

25 Where the unit or establishment has investigated the loss or damage to a dosimeter and no estimated dose can be provided, the ADS will enter a notional dose into the individual's radiation record. A notional dose is obtained from the proportion of the annual dose limit for the dosimeter issue period. Notional doses will only be entered into individual dose records in exceptional circumstances when it has not been possible to provide proper estimates of dose.

## Irradiated Dosimeters

26 If it has been suspected that a dosimeter has been inadvertently irradiated, the unit or establishment is to annotate the Remarks / Changes Required column of the Dosimeter Issue List with the following note: 'This dosimeter has been irradiated, please see attached ADS Form 94'. An estimated dose form is to be completed and returned at the same time as the dosimeter to allow the estimated dose to be entered. Failure to do so may result in a special entry dose being awarded in replacement of the assessed dose - see guidance in Annex B to this leaflet.

## Issue and Return of Dosimeters

27 The RSO or RPS is to co-ordinate all arrangements for personal monitoring.

28 The normal wear period for each type of personal dosimeter is detailed in Table 1. Dosimeters are normally to be worn starting from the calendar month for which they have been issued, unless advised specifically otherwise by the RPA. Dedicated accident or emergency dosimeters, which are not used for routine personal monitoring purposes, are issued every six months by Dstl ADS. The previous issue of dosimeters is to be returned immediately to the Dstl ADS following receipt of the next issue.

Table A1 Period of wear for personal dosimeters

Dosimeter Type	Wear Period
----------------	-------------

<sup>(1)</sup> Whole-body (routine) TLD	1 or 3 months
<sup>(2)</sup> Whole-body (accident) TLD	6 months
Whole body (emergency) TLD	Duration of intervention
Skin/extremity TLD	1 month
Dstl Combined dosimeter	3 months
<sup>(3)</sup> Radon dosimeter	3 months

NOTES

(1) Routine whole body TLDs are generally issued for one month although this may be extended to cover two or three monthly periods upon advice from the RSO or RPS.

(2) Dedicated accident whole body TLDs, which are not used for routine personal monitoring are generally issued every 6 months by Dstl ADS unless an accident occurs in that period.

(3) Environmental radon detectors are generally issued for a 3 month period.

29 As stipulated above, Dstl Combined dosimeters are generally worn for three months. For instances where it is anticipated that an issue period greater than three months may be required, it is recommended that the extended wear period is kept to a minimum and is never to exceed a total of twelve months. This is because it is very difficult to make an accurate dose assessment beyond the normal wear period due to increased uncertainty in the level of background subtraction to be applied.

30 All dosimeters (including those unused or damaged) are to be returned promptly for assessment to Dstl ADS together with the completed Dosimeter Issue Lists at the end of the wear period. The returned Dosimeter Issue Lists are to be clearly annotated to indicate any changes which the unit or establishment requires to be made to the original Issue List. These changes are to be annotated in the Remarks/Changes Required column of the Issue List. Dosimeters which will not be used for the wear period are not to be returned early.

31 Units and establishments are to inform Dstl ADS, before dispatch, of any dosimeters that are considered to be contaminated. Advice is to be sought from Dstl ADS on the method of returning such dosimeters.

## Completion of the Dstl ADS Dosimeter Issue List

32 Instructions for completing Dstl ADS Dosimeter Issue Lists are contained on the form itself. Further advice on completing the Dosimeter Issue List may be obtained from the Dstl ADS.

33 Female workers who have declared their pregnancy to the employer are subject to a radiation dose constraint such that the dose to the foetus does not exceed 1 mSv during the remainder of the pregnancy. Units and establishments are therefore to inform the Dstl ADS by annotating the Remarks/Changes Required column of the Dosimetry Issue List with the expected date of delivery. Dstl ADS will annotate the remarks section of the Radiation Dose Record Summary with the radiation dose received during the pregnancy term, to enable the employer to monitor the individual throughout the term of her pregnancy.

## **Issue of Dstl ADS Dosemeters to Personnel in Receipt of Dosemeters Issued by Another Employer**

34 Personnel in receipt of doseimeters issued by another employer (such as Territorial Army, Royal Naval Reserve and Royal Air Force Reserve staff who work for other employers as well as MOD) must be issued with doseimeters provided by the Dstl ADS for the period of working with ionising radiation when attached to the MOD. These personnel are to complete a Personal Details Form FMed 291E which is to be forwarded to the Dstl ADS upon return of the worn doseimeters. The completion of this form will facilitate co-operation between employers and ADS to ensure that radiation doses records and dose limits are maintained.

### **Casual Visitors**

35 Units and establishment are to issue radiation doseimeters to casual visitors unless alternative instructions are contained in local orders. For each casual visitor issued with a Dstl ADS personal doseimeter the following actions are to be taken:

The visitor is to complete a Personal Details Form FMed 291E which is to be forwarded to the Dstl ADS upon return of the doseimeter; or

The number 4 is to be entered into the 'cat' codes column of the Dstl ADS Doseimeter Issue List for the doseimeter;

Accident doseimeters may be issued to visitors and contractors in submarines. These doseimeters are not issued for routine dose assessment purposes and may be reissued to other visitors during the six monthly issue period.

### **Notification of Changes in Circumstances**

36 A completed Personal Details Form (FMed 291E) is to be forwarded to Dstl ADS when any of the following occur for personnel registered with the Dstl ADRKS:

There is a change in personal details, such as surname on marriage or job as described in the job code, or change of permanent employer address;

A worker restarts radiation work;

An individual who is designated as a classified person leaves MOD employment for any reason. In such circumstances a termination record for the individual is to be requested from the Dstl ADRKS and a forwarding address is to be provided to enable a copy of the termination record to be forwarded to the individual;

On notification of death of a current radiation worker;

The Dstl ADS personal dosimetry number or alternatively service number is unknown;

If an employee ceases to be a classified person.

37 In circumstances where it can be stated in writing by the RSO or RPS of the unit or establishment concerned that an individual who has been declassified is extremely unlikely to resume work with ionising radiations during their future employment with the MOD a termination record for the individual is to be requested from the ADS. Individuals may be declassified at any time in the calendar year. Any further occupational radiation exposure received by any such person must be monitored using a radiation dosimeter issued by the ADS and the dose recorded in the individual's dose record and an updated termination record requested upon cessation of radiation work or termination of MOD employment.

## **Completion of Radiation Work at an Establishment**

38 Classified persons: The unit or establishment is to undertake the following tasks for each classified person registered with an ADS, usually Dstl ADS, who ceases radiation work at an establishment:

For individuals leaving MOD employment, submit a Personal Details Form FMed 291E to the Dstl ADS requesting a termination record including a forwarding address and the date of employment termination. This also applies to persons who have previously been designated as classified persons, which is to be indicated by the attachment of a PD2 label to their central personnel file or FMed 291A if uniformed personnel.

If the individual is leaving MOD employment, remove their name from the pre-printed Dstl ADS Issue List and add the following text in the remarks column Left MOD – 'Please take off regular issue'. If the individual is ceasing radiation work at an establishment but continuing employment with MOD, delete their name from the pre-printed Dstl ADS Issue List and add the following text in the remarks column - 'Posted/transferred - please take off regular issue'.

Forward the individual's dose records and radiation passbook (if issued) to the employees next employer if known or if not return the documents to the Dstl ADS.

Inform the individual in writing if they have ceased to be a classified person.

For classified persons continuing employment with MOD, ensure that a PD2 label is attached to the relevant documents for the individual.

39 Non-classified persons: For any individual who has at any time during their MOD employment been employed as a classified person, the RSO at the unit or establishment is to submit a Personal Details Form FMed 291E for the individual to Dstl ADS to request a termination record. A forwarding address for the individual is also to be included.

40 Any individuals ceasing employment and who have never been designated as a classified person may request (in writing) a Radiation Dose History report from Dstl ADS.

## Description of Dstl Approved Dosimetry Service Forms and Associated Medical Forms and Documents

41 The Dstl ADS produces several dedicated forms to assist MOD personnel with the administration of dosimetry services. The Dstl RPS forms and related MOD medical documents together with their uses are described as follows:

**Dstl ADS Laboratory Certificate:** This form is issued to each unit or establishment following assessment of returned dosimeters or input of internal dose assessments on to the Dstl ADRKS Keeping System. The Laboratory Certificate provides a summary of all the dose assessments;

**Quarterly Dose Reports:** Dstl ADS issues these person-specific reports shortly after the end of each calendar quarter for all individuals who have been monitored during that period. In addition, the fourth quarter's report is produced for individuals having any dose assessments included on their dose record during that calendar year. The Radiation Dose Record Summary report is forwarded automatically to the RSO or RPS. The form is to be filed in an individual's radiation FMed 291A envelope. The form shall be available to the RSO or RPS and the Appointed Doctor and may be inspected on request by the individual to whom it refers.

**Form FMed 291F (Health Record):** The health record is used to report on the fitness of an employee for designation as a classified person. In the UK the second part can only be completed only by an Appointed Doctor. The record is to be kept in the custody of an appropriate person and is to be made available to any person who is authorised to examine it;

**Form FMed12 (request for special medical examination (or its civilian equivalent):** This form is to be used for blood-examination reports and is to be dealt with as follows:

41.1.1 The Appointed Doctor shall enter the result of the examination on Form FMed 291C and take appropriate action (which is retained in F.Med 291A);

41.1.2 The original form is to be placed in the FMed 4.

**Form FMed 291A (medical envelope):** This form is provided for establishments to retain all the relevant radiation dose records and associated documents. The unit or establishment is to maintain a Form FMed 291A for classified persons or persons who have previously been designated as classified persons. On transfer of such individuals within the MOD, the FMed 291A and all the enclosures held by the unit or establishment are to be forwarded to the next establishment if they are to continue radiation work, or returned to the Dstl ADS;

**Form PD2 (gummed label for FMed 291A and central personnel file):** The PD2 label readily identifies that the individual has been employed as a classified person and must be attached to their FMed 291A dosimetry record and their central personnel file and, in the case of uniformed personnel, the personal medical documents, to ensure that a termination record is raised upon cessation of radiation work or termination of employment. To facilitate this, Dstl ADS will issue copies of form PD2 on request from the RSO or RPS, and must be used on the first occasion that an individual is designated a classified person:

41.1.3 This form is a small gummed label which specifies that:

This person has been employed as a classified person. On discharge from the service, Dstl ADS is to be informed in accordance with the Regulations so that a termination record can be raised. PD No..... This slip is to be attached to the personal file of the individual concerned. The original file held in the employing department is to be used for this purpose, and it is the responsibility of the employing department to inform Dstl when the individual leaves the service as part of their discharge procedure.

PD No.....



Form FMed 291C (radiation medical examination record): This form shall be treated as PROTECT - MEDICAL and shall be used to record the following information for classified persons:

41.1.4 Pre-engagement medical examination;

41.1.5 Annual health reviews;

41.1.6 Special medical examination (e.g. ophthalmic).

Form FMed 291D (radiation record summary card): This form must be completed by the parent establishment and issued to all relevant persons working away from their normal MOD station or when such persons are transferred temporarily or permanently to a different MOD place of work. It shall carry the PD number of its bearer. The RSO or RPS issuing dosimeters to classified persons or workers under written arrangements shall examine this card, use the PD number as necessary and complete the appropriate columns before the individual returns to their normal MOD station.

Radiation Passbooks: Radiation passbooks are issued to classified persons who are required to undertake work in a controlled area designated by another employer. These are available from the Dstl ADS for MOD classified persons. They are either allocated directly to an individual or issued to MOD establishments who will allocate them. The radiation passbook has a unique serial number and is not transferable. Further information on the use of radiation passbooks is given in Annex C.

Form FMed 291E (personal details form): This form is used to register all radiation workers with the Dstl ADRKS. The form must be completed by the individual before any radiation dose assessments are undertaken. Full instructions are given on this form which must be completed as fully as possible and forwarded to the Dstl ADRKS. Changes to occupational codes or classification are to be notified using a Personal Details (PD) Form. They need not be raised if an individual has previously been registered with the Dstl ADS, providing their PD number is known.

Dstl ADS Dosimeter Issue List: The purpose of the Dstl ADS Issue List is to ensure that the results of radiation dose assessments, as recorded by personal dosimeters, are recorded in the correct radiation dose record. The Dstl ADS Dosimeter Issue List is issued together with Dstl ADS dosimeters. The Issue List contains details of the dosimeter type, dosimeter serial number, issue period and where appropriate, details of the dosimeter wearer. Generally, dosimeters which have not been pre-allocated to an individual may be issued to visitors, newly posted individuals or used for environmental monitoring purposes.

ADS Form 94: This form is used to provide the ADS with an estimated dose in the event that a dosimeter is lost or damaged or inadvertently irradiated.

Dstl ADS Warning Reports/Overexposure Reports: In addition to Laboratory Certificates of dose results provided to each customer, Dstl ADS also provides Over-exposure Reports and Warning Reports for any person registered with the Record Keeping Service who has exceeded a relevant dose threshold. These reports are dispatched with the Laboratory Certificates.

Termination Records: The employer has a statutory duty to ensure that the Dstl ADS raises a termination record whenever a person who is or has been designated a classified person leaves the MOD. The termination record summarises the radiation exposure for the individual during the period of employment. Generally, if a person has ever been classified, a PD2 label is to be attached to their central personnel file and their FMed 291A dosimetry record. Requests for termination records are to be made by completing a Personal Details Form (FMed 291E) for the individual which is to be forwarded to Dstl ADS. The form is to have a tick placed in Box 19 and must include details of a forwarding address for the employee and date of termination of employment. Dstl ADS will send the termination record to the individual at the address provided and a copy of the termination record to the HSE as required by IRR99.



## Leaflet 6 Annex B

# Guidance for Line Managers and Employees on Estimated Doses and Special Entries

## CONTENTS

### Paragraph

- 1 Introduction
- 2 Amendment of radiation doses allocated to an individual's radiation record
- 5 Definition of doses much greater or less than that recorded in the dose record
- 6 Adequate investigation
- 8 Approved dosimetry service action
- 13 Employee consultation

## Introduction

1 The ADS will amend dose records in accordance with the special entry arrangements specified in IRR99. Where appropriate, the unit or establishment is responsible for applying for such special entries.

## Amendment of Radiation Doses Allocated To an Individual's Radiation Record

2 Classified persons: Whenever any person has reasonable cause to believe that the radiation dose recorded on a Laboratory Certificate issued by the ADS, usually Dstl ADS, for a classified person is much greater or much less than the dose received by the relevant individual, the circumstances are to be reported to the RPS or RSO. An investigation is to be undertaken by the unit or establishment, and, where the investigation confirms the belief that the dose recorded is incorrect, the following action is to be taken:

Application is to be made to replace the assessed dose with a special entry to the individual's dose record by submitting full details of the investigation through normal channels to the appropriate TLB safety authority for radiation safety, for onward transmission to the ADS. For those establishments with a resident full time RPA, application is to be made for a special entry by submitting full details of the investigation to the RPA, for onward transmission to the ADS, and a copy sent to the appropriate TLB safety authority. A copy of the investigation report is to be retained for at least 2 years;

Forward an ADS form 94 to request a replacement dose be entered in the individual's record;

Consent for a special entry is required from the HSE in any case where the cumulative recorded dose exceeds a legal dose limit as detailed in Leaflet 4;

Doses assessed from dosimeters that were lost in high radiation areas, if recorded, will remain on an individual's personal dose record until notification of special entry request is received by the ADS;

A copy of the investigation is to be forwarded to Dstl ADS for retention within the individual's radiation dose record.

3 Special entries so approved are to be entered in the relevant individual's record and a copy is to be supplied to the individual.

4 Other radiation workers: For other radiation workers who are not designated as classified persons, application is to be made for a dose amendment to be made to the individual's dose record by submitting full details of the investigation through normal channels together with a fully completed ADS Form 94 (Estimated Dose Form) to the appropriate TLB safety authority who will approve the amendment to the radiation dose record and inform the ADS.

## **Definition of Doses Much Greater or Less Than That Recorded in the Dose Record**

5 The RSO or RPS is to review the investigation to ensure that it is sufficient to produce an estimate of the dose received by a classified person. That estimate is to be regarded as much greater or less than the original entry in the dose record for a particular period if:

The dose received differs from the original entry by at least 1 mSv for recorded doses of 1 mSv or less; or

The dose received differs from the original entry by a factor of 2 or more for recorded doses in excess of 1 mSv but less than the relevant dose limit; or

The dose received differs from the original entry by a factor of 1.5 or more for recorded doses at or above the relevant dose limit.

## **Adequate Investigation**

6 An adequate investigation is one that is sufficiently thorough to show there is reasonable cause to believe that the dose entry in the dose record is substantially incorrect. The investigation is to at least take account of:

Relevant information provided by the ADS;

Details of the pattern of work of the individual such as the time spent in particular controlled and supervised areas;

Measurements from any additional dosimeter or direct reading device worn by the person concerned;

Individual measurements made on other employees undertaking the same work with ionizing radiation; and

The results of monitoring for controlled and supervised areas carried out.

7 In addition, it is worth considering:

A credible reconstruction of the exposure conditions for the employee's dosimeter to demonstrate that there is reasonable cause to believe that the exposure it received was likely to have occurred when not being worn;

The layout of the working area, the radiation sources in it and any shielding or other controlled measures available to restrict exposure;

The reliability of engineering controls, design features, safety features and warning devices specifically provided to restrict exposure;

Details of any radiation monitors/alarms and their reliability;

Training records and experience of employees;

Arrangements for storage / security of dosimeters against risks of inadvertent / malicious exposure or contamination;

Systems of receipt, handling of dosimeters including the use of security X-ray devices at the unit or establishment.

## **Approved Dosimetry Service Action**

8 Dstl ADS may be reluctant to act on a request for special entry if the information provided appears to be inadequate to support a change to the recorded dose. Dosimetry services are only approved to make special entries requested by units and establishments which satisfy the requirements of the IRR99. In such circumstances the Dstl ADS will request further and better details to support the case.

9 Dstl ADS will perform the requested dose replacement following the details provided on the ADS form 94 and within the investigation report.

10 A revised laboratory certificate will be provided to the unit/establishment following the dose amendment.

11 A revised Quarterly Dose Record will be provided to the unit/establishment for the individual concerned during the relevant quarter in which the amendment was made.

12 A fee will be levied for the administration procedures in amending a dose.

## **Employee Consultation**

13 The classified person must be consulted during the investigation and notified of any special entry proposed. If the classified person is aggrieved by the decision to apply for special entry they can request the HSE to review that decision within 3 months of being informed. For other persons it is not required.

14 The HSE can direct the unit or establishment to arrange for the original entry to be restored if it is not satisfied with the investigation, or a reasonable estimate of the dose has not been established.

## Leaflet 6 Annex C

### Dosimetry Arrangements for Outside Workers

#### CONTENTS

##### Paragraph

- 1 Introduction
- 2 Radiation passbooks

#### Introduction

1 The responsibilities and duties of the outside worker, their employer and the operator of the controlled area must be formally agreed before any work is undertaken. The responsibilities of these individuals are detailed in Leaflet 38 and the specific arrangements for dosimetry are below.

#### Radiation Passbooks

2 MOD units and establishments with classified persons intending to undertake radiation work in a controlled area at another establishment or at a non-MOD site are to ensure that those employees are each provided with an individual radiation passbook. The radiation passbooks are available from the ADS and may be issued to named individuals by the ADS or issued to their employer who will then allocate them to their outside workers. A record is to be kept by the ADS and the employer of the issue of radiation passbooks and of any losses. Such records are to be kept for a period of 5 years after the passbook has ceased to be used by the outside worker.

3 The radiation passbook has a unique serial number and is not transferable between individuals and the employer is to ensure that the particulars entered are kept up to date. The outside worker can retain the passbook when transferring to employment with another employer. Information is to be entered into the passbook by a person who has been authorised, in writing, by the employer, the operator of the controlled area or the ADS. The authorised person is to have direct responsibility for the outside worker or have responsibilities for radiological protection, such as the RSO or RPS. Particulars to be entered in the radiation passbook are given below.

4 In the event of the loss of a passbook the circumstances are to be investigated by the employer and an assessment or estimate made of the radiation dose received by the outside worker. The result of the investigation is to be entered into the record referred to above. A passbook issued to replace a lost passbook is to be clearly marked with the word 'replacement'.

5 Radiation passbooks which are full or which have been withdrawn are to be forwarded by the employer to the ADS where they will be stored for the statutory period. When the passbook is full a new passbook is to be requested from the ADS.

6 In the event of a classified person being declassified, the radiation passbook is to be returned to the ADS where it will be stored for the statutory period. If a worker is re-designated as a classified person, the last radiation passbook can be re-issued to the worker until full when a new passbook will be issued, or if previously issued before 30 April 2000, a new passbook will be issued. If a classified person leaves MOD employment, the passbook is to be returned to the ADS.

7 Particulars to be entered into the radiation passbook are as follows:

Serial number of the passbook;

A statement that the passbook has been approved by the Health and Safety Executive;

Date of issue of the passbook by the ADS;

The name, telephone number and mark of endorsement of the issuing ADS;

The name, address, telephone and telex/facsimile number of the outside worker's employer;

Full name (surname and forename), date of birth, gender, Personal Dosimetry number and National Insurance number of the outside worker to whom the passbook has been issued;

Date of the last medical review of the outside worker, the relevant classification in the health record as fit, fit subject to conditions (which shall be specified) or unfit;

The relevant dose limits applicable to the outside worker to whom the passbook has been issued;

The cumulative dose assessment (external and/or internal) in mSv for the year to date for the outside worker, and the date of the last assessment period;

In respect of work undertaken by the outside worker, the employer responsible for the controlled area must ensure that the following particulars are entered in the radiation passbook by people authorised by the ADS or employer:

7.1.1 The name and address of the employer responsible for the controlled area;

7.1.2 The period covered by the performance of the services;

7.1.3 Estimated dose information, which shall be, as appropriate;

7.1.3.1 An estimate of any whole body effective dose in mSv received by the outside worker;

7.1.3.2 In the event of non-uniform exposure, an estimate of the equivalent dose in mSv to organs and tissues as appropriate;

7.1.3.3 In the event of internal contamination, an estimate of the activity taken in or the committed dose;

7.1.4 The passbook must be made available to the worker on request.

## Leaflet 6 Annex D

# Guidance for Line Managers and Employees on the National Registry for Radiation Workers

## CONTENTS

### Paragraph

- 1 Introduction
- 2 Purpose of the registry
- 4 Eligibility
- 7 Benefit of inclusion of the historic data
- 8 Information supplied
- 9 Data confidentiality
- 10 Advantages of the registry
- 12 Opt out arrangements

## Introduction

1 Public Health England (PHE) has set up a National Registry for Radiation Workers (NRRW) and you are invited to collaborate in the provision of certain personal information to the NRRW. It is hoped that the notes below will help you in your consideration of this matter.

## Purpose of the Registry

2 The MOD safety standards for radiation workers are based on the recommendations of the International Commission on Radiological Protection (ICRP) as endorsed by the Medical Research Council (MRC) and PHE for application in the UK. Exposure to radiation is carefully monitored to ensure that these internationally accepted standards are complied with. Nevertheless, the MOD has fully supported the establishment of the NRRW and expects that the information it collects, when analysed, will bear out the confidence they have in their radiation protection standards.

3 The MOD supports the NRRW scheme to collect accumulative information on radiation exposures in order to study, over the long term, whether there is any evidence of differences in the cause of, and the age at, death of workers exposed to different levels of radiation at work including the lowest dosage levels recorded.

## Eligibility

4 PHE has concentrated successively on employees at British Nuclear Fuels Limited, the UK Atomic Energy Authority, the Central Electricity Generating Board and now the MOD. In due course they expect to extend the NRRW to include other groups of employees working with radiation.



5 The NRRW started with information on employees who were radiation workers (including workers with radioactive materials separately identified) on 1 January 1976 or who have become radiation workers since that date.

6 The historical radiation worker dose records held for periods prior to 1979 have been computerised and have been transferred to the NRRW. This brought MOD into line with other employers who have already supplied their employees' historical data to the NRRW.

## **Benefit of Inclusion of the Historic Data**

7 These data are considered particularly important by PHE because radiation doses received in the 1960s and 1970s tend to be larger than those received more recently, and employees who started radiation work several decades ago would have had a longer time to accumulate doses than those who started work in the 1980s and 1990s. Moreover, because these early workers tend to be older than more recently employed workers, and mortality rates increase with increasing age, there will be more deaths in this group. Any effect of radiation exposure, if indeed one exists, is more likely to be identified by the inclusion of this group of workers in the study population.

## **Information Supplied**

8 The only information which will be given to the NRRW by the MOD is the following:

Family name, forename (if necessary, full name, title and previous family name, if any);

Sex;

Name of employer;

Date of birth, and place of birth (if known);

National Insurance number;

Service/pay number;

Dockyard Number (if appropriate);

National Health Service number (i.e. the number on the National Health card used in connection with registering with a doctor), and, if necessary, permanent home address;

Job code;

Entry date;

Rank/title;

Accumulated radiation dose data up to the end of the previous year, including an indication of exposure to specific radioactive materials, updated annually;

Information about any occupational and environmental exposure conditions relevant to radiation health effects as necessary;

An indication of involvement in radiation incidents.

NOTE: NO OTHER DETAILS OF PERSONAL MEDICAL HISTORY ARE SUPPLIED.

## Data Confidentiality

9 PHE will hold the data on a computer; and has guaranteed complete confidentiality of individual records and has satisfied the MOD that their safeguards are reliable. No information on specified individuals contained in the NRRW will be communicated to anyone other than the employer supplying the original entries or to any individual radiation worker at their own request.

NOTE: THE RADIATION RECORDS MAINTAINED AT YOUR PLACE OF EMPLOYMENT WILL PROVIDE MUCH MORE DETAIL THAN THAT MAINTAINED OR NEEDED BY THE REGISTRY.

## Advantages of the NRRW

10 It is in the interest of all that reliable information is to be available about the age, accumulated radiation dosage, if any, and cause of death of those who have been employed in the nuclear industry. By studying the data, particularly that concerning low levels of radiation dosage, comparison can be made with the safety standards set both nationally and internationally and thus permit a more meaningful interpretation to be put on these recommended standards.

11 The Staff Side of the MOD Whitley Council and the Trade Union Side of the MOD Joint Industrial Whitley Council have been consulted on the details of the scheme and have agreed that it would be in the interests of MOD employees to participate in the scheme. Unless, therefore, you specifically request in writing that your name be excluded from the NRRW you will automatically participate in these arrangements.

## Opt Out Arrangements

12 Anyone who has been employed on radiation work and who does not wish to have their records transferred, may opt out by writing to The ADS Data Team, Dstl ADS, INM, Crescent Road, Alverstoke, Gosport, Hants PO12 2DL.

## Leaflet 6 Annex E

# Guidance for Line Managers and Employees on Medical Surveillance of Classified Persons

## CONTENTS

### Paragraph

- 1 Introduction
- 2 Medical surveillance
- 7 Special medical surveillance
- 8 Suspension from employment as a classified person
- 12 Transfer of establishment for classified persons
- 13 Statistical returns
- 14 Female classified persons

## Introduction

1 The main purpose of medical surveillance is to determine an individual's fitness or continuing fitness for the intended work with ionising radiation. In this context, fitness of the person is not restricted to possible health effects from exposure to ionising radiation. The Appointed Doctor (AD) or employment medical adviser will need to take account of the specific features of the work with ionizing radiation and must be allowed to inspect the workplace if they require it.

## Medical Surveillance

2 The AD is to be provided with adequate facilities to carry out medical examinations. They are to be provided with copies of dose summary records, sickness/absence records and the health record of personnel being examined and allowed access to working areas so that they may be inspected. The AD is to determine the form of this examination, taking account of the nature of the work, the individual's state of health and guidance provided by the HSE. However, at the initial medical examination, a description of the work to be undertaken, past medical, family and occupational and social histories should be carefully taken and positive findings with the results of physical examination notated on the FMed 291C. The outcome is to be entered and signed in the Health Record (FMed 291F). Unless indicated by medical history or the clinical findings, an X-ray examination of the chest or full blood count are not prerequisites for either the initial medical examination or for subsequent reviews.

3 Every classified person is to have a health review conducted by the AD annually. This review should be conducted in the presence of the classified person who should provide current details of the medical histories so that any recent changes may be noted. If it is not practicable for the classified person to be present then the review must, as a minimum, include an assessment of the current job title(s), content(s), sickness absence and dose records for the preceding 12 months. Where the AD considers it necessary, they are to insist on the classified person being present for the review and determine whether and what medical examination and, or medical tests may be appropriate to the circumstances. The review represents, also, an opportunity to provide general health advice and to discuss the significance of doses accrued.

4 As industrial radiographers have an increased risk of accidental and unsuspected overexposure, all MOD classified persons undertaking industrial radiography must attend for review and be examined for signs of deterministic effects with especial attention directed at the skin and nails of the upper extremities.

5 In all cases, the content of the review must be clearly documented on the FMed 291C (or equivalent HSE form MS 101). Classified persons considered fit to continue radiation work are to be re-certified as fit by signed entry, by the AD, in the health record (FMed 291F or equivalent HSE form 2067).

6 The AD may undertake health reviews of classified persons at any time within the 12-month period if it is considered necessary. Those whose classified status has lapsed, and/or have not undergone health review by an AD and been certified fit within the preceding 13 months are to be treated as persons starting their first employment as classified persons.

## Special Medical Surveillance

7 The AD is to conduct special medical surveillance on any worker who has received a radiation dose more than any statutory relevant dose limit detailed Leaflet 4. Guidance on the form of this examination is provided in the 'Guidance for Appointed Doctors (Revised 2003) IRR99'. The AD is to inform the local Senior Medical Inspector (SMI) of any known or suspected overexposure.

## Suspension from Employment as a Classified Person

8 The AD may, by signed entry in the health record, suspend from employment as a classified person any worker they have examined and found unfit for radiation work. The AD is to notify, immediately, the following of any suspension:

The CO of the unit;

The RSO or RPS;

The ADS;

The HSE\*.

NOTE\* THE HSE NEED ONLY BE INFORMED IF SUSPENSION RESULTS FROM OVEREXPOSURE AND THAT NOTIFICATION WILL USUALLY BE MADE BY THE RPA OR RSO, THOUGH THE AD MAY ALSO FIND IT USEFUL TO ENTER INTO DISCUSSION WITH THE LOCAL SMI. WHEN SUSPENSION IS DUE SOLELY TO MEDICAL FACTORS THEN THERE IS NO REQUIREMENT TO INFORM HSE, THOUGH AGAIN, THERE MAY BE BENEFIT IN DISCUSSING WITH THE LOCAL SMI, ESPECIALLY IF AN APPEAL IS THOUGHT LIKELY TO RESULT.

9 A classified person who has been suspended is not to be re-employed as a classified person until re-certified fit by signed entry of the AD in the health record. The AD is then to inform the CO, RSO (or RPS) and ADS of each case.

10 Where full suspension is deemed unnecessary, the AD may impose appropriate restrictions in the health record, either upon initial employment or at annual or earlier review, of a classified person. The person is to be employed by the CO only under the prescribed restrictions.

11 Should any civilian worker disagree with the decision of the AD, they may, within 3 months of notification of the decision, apply in writing to the HSE for the decision to be reviewed. The result of such a review is to be notified to the worker and entered on their health record. Service personnel should not appeal directly to the HSE in the first instance, but are to represent their cases through the normal Service procedures. Should they remain dissatisfied, they still have the right to refer their cases to the HSE for resolution.

## **Transfer of Establishment for Classified Persons**

12 The AD at, or for, an establishment to which a classified person has been transferred permanently or for periods of detachment exceeding 3 months is to request a copy of the entry in the health record from the previous establishment. The classified person is not to undertake radiation work at the new establishment until the AD has received this documentation.

## **Statistical Returns**

13 ADs are required to submit statistical returns on a prescribed form, supplied by the local SMI, at the frequency specified by HSE. This information will include details of the AD, number of examinations performed by that doctor and the number of unfit assessments.

## **Female Classified Persons**

14 Women deemed for the purposes of the Regulations of reproductive capacity are limited to a maximum dose of 13 mSv to the abdomen in any consecutive 3 month period. The likelihood of this occurring is to be entered into Part A of FMed 291F (or HSE form 2067) prior to the initial or subsequent review. Every prospective female classified person must be reminded that she is to notify her employer, in writing, that she is pregnant or breastfeeding. Thereafter, or as soon as the employer might otherwise reasonably become aware, the conditions of exposure must be modified, as necessary, to ensure that:

The equivalent dose to the foetus is unlikely to exceed 1 mSv during the remainder of the pregnancy, and that

Significant contamination by ingestion or inhalation of radioactive substances is prevented whilst breastfeeding.

