6 Dosimetry and Personal Dose Records (including Medical Surveillance of Classified Persons)

Scope

1. This chapter is intended to assist MOD line managers and employees in complying 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 record keeping in the following specific legislation:

a. The Ionising Radiations Regulations 2017 (IRR17);

b. The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR 2019);

3. There is a statutory requirement to ensure that all classified persons are certified as fit for their intended type of work and that arrangements are made for continuing medical surveillance, with appropriate records maintained in accordance with IRR17.

Duties

4. Duties as detailed in Chapter 39 apply. In addition, the following duties also apply.

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

5. COs / HoEs are responsible for:

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

b. ensuring that personal dosimetry is available for classified persons and other radiation workers where appropriate;

c. ensuring that the results of personal dosimetry are recorded;

d. retaining a copy of the dose record summaries received from the ADS for at least 2 years;

e. providing individuals with a copy of their dose record on request;

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

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

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

i. ensuring that a registered medical practitioner (adequately trained then 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;

j. ensuring that personnel who require medical surveillance by an Appointed Doctor or employment medical adviser for the purpose of determining their fitness for work with ionising radiations receive such surveillance;

k. ensuring that the Appointed Doctor 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;

l. ensuring that a health record is maintained for personnel who require medical surveillance and a copy of that record is retained; and

m. ensuring that employees who have been subject 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 Coordinator

6. RSOs / RPSs / Dosimetry Coordinators are responsible for:

a. ensuring that personnel are provided with the correct dosimetry;

b. completing the dosimetry administration;

c. ensuring that personnel are informed that their dosimetry data will be provided to the National Registry for Radiation Workers (NRRW) unless they opt out (see Annex A for further information);

d. instructing personnel in the correct method of wearing the dosimetry; and

e. promptly notifying the ADS of changes in circumstances relevant to the provision of dosimetry.

Employees

7. Employees are responsible for:

a. ensuring that they wear their personal dosimetry whenever they are working with ionising radiation;

b. ensuring that they do not damage or interfere with their own or other employee’s personal dosimetry;

c. informing their dosimetry coordinator if their personal dosimetry has been lost, damaged or inadvertently irradiated;

d. storing their personal dosimetry securely, in an area with low background radiation, when not in use; and

e. 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:

a. assessment of whole-body or part-body doses arising from external radiation;

b. assessment of doses arising from intakes of radionuclides;

c. assessment of emergency doses following a radiation emergency (REPPIR 2019); and

d. coordination of dose assessments and record keeping of assessed doses.

9. Line managers at units that employ classified persons must have an ADS for dose assessment and record keeping. The Radiation Protection Adviser (RPA) can provide advice about the types of radiation exposure that need to be assessed and the types of ADS that are required. The ADS is to provide clear advice on the use of dosemeters or other equipment supplied for making measurements of dose. The ADS must be provided with sufficient information about employees to enable dose assessments to be made and records to be kept.

10. The Defence Radiation Protection Services (DRPS) ADS provides an integrated range of dose assessment and record keeping services that are approved by the HSE (Annex B). Enquiries about these services can be made by telephoning 01189 858080 or by sending an email to drpsdosimetry@awe.co.uk .

Personal Radiation Monitoring and Assessment

11. Employees engaged in certain types of work, or likely to receive an effective dose (whole body dose) greater than 6 mSv per year, an equivalent dose to the lens of the eye greater than 15 mSv per year, or an equivalent dose to the skin or the extremities greater than 150 mSv per year, are to be designated as classified persons. Details of the requirements for classified persons are given at Chapter 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 by an ADS – for external radiation doses, this normally involves the use of personal radiation dosemeters.

12. Within the MOD, it is normal practice that non-classified persons entering controlled areas (see Chapter 4) are also issued with personal radiation dosemeters supplied by an ADS. Non-classified persons are only permitted to enter controlled areas under written arrangements (see Chapter 5). In some cases, where personal radiation dosemeters are unnecessary, the written arrangements may allow for doses to be assessed by an alternative method. RPA advice must always be sought regarding the arrangements for controlled areas (see Chapter 7).

13. In addition to the use of personal dosemeters for external radiation exposure, there are a number of other methods of assessing personal dose that 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 and 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, in-vivo monitoring and / or personal air sampling.

Appropriate Dose Assessment Periods

14. 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 magnitude of the expected dose and the stability of the stored signal on the dosemeter 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 dosemeter has received an unusually high dose in the event of an accident or other occurrence.

Accident and Emergency Doses

15. **Accident doses**. Under IRR17, when an accident or other occurrence takes place that is likely to result in an employee receiving an effective dose (whole body dose) greater than 6 mSv, an equivalent dose to the lens of the eye greater than 15 mSv, or an equivalent dose to the skin or the extremities greater than 150 mSv, the employer must arrange for a dose assessment to be made by the ADS as soon as possible. In cases where dosimetry was not worn, the dose must be assessed by an appropriate means having regard to the advice from an RPA. All reasonably practicable steps must be taken to inform the employee of the result of the dose assessment, and a record of the assessment must be kept until the employee has, or would have, attained the age of 75 years, or for 30 years from when the record was made, whichever is the later.

16. **Emergency exposures**. An emergency exposure is an exposure of an employee engaged in an activity associated with the response to a radiation emergency or potential radiation emergency. When an emergency plan made under REPPIR 2019 (see Chapter 3) concludes that it is possible for an employee to receive an emergency exposure the employer is to, in relation to dosimetry:

a. identify those employees who may be subject to emergency exposures;

b. make arrangements with an ADS for emergency dose assessments to be made without delay for those employees who may potentially receive an emergency exposure (separate to other dose assessment systems in place);

c. make arrangements with the ADS for the results of emergency dose assessments to be reported without delay to the employer and to the regulator;

d. make arrangements to notify the results of emergency dose assessments without delay to the Appointed Doctor or employment medical adviser who will be carrying out medical surveillance on employees to whom emergency dose assessments relate; and

e. make arrangements for medical surveillance to be carried out without delay for employees who have received emergency exposures.

17. In the unlikely event of a nuclear reactor emergency at a MOD site, the dosemeters that were worn by personnel in the Exclusion Zone at the time of the event must be collected and transported to the ADS as a matter of urgency. The arrangements in place to meet this objective must be clearly stated in the operator's emergency plan.

18. The ADS is to send the results of accident exposure dose assessments to the employer within 8 hours of receipt of the dosemeters for analysis. The employer will forward the results to the Appointed Doctor or the employment medical adviser; and, in the case of a nuclear reactor emergency, to the Duty Diving and Radiation Medicine Specialist at the Institute of Naval Medicine, INM.

19. Emergency dosimetry (issued for the assessment of emergency exposures) must also be transported to the ADS as a matter of urgency. The arrangements in place to meet this objective must be clearly stated in the operator's emergency plan. The ADS must send the results of emergency exposure dose assessments to the employer without delay. The employer will forward these results to the Appointed Doctor or the employment medical adviser; and, in the case of a nuclear reactor emergency, to the Duty Diving and Radiation Medicine Specialist at INM.

20. The DRPS ADS has members of staff on call, at two hours' notice, to ensure that accident / emergency dosemeters can be assessed within the timescales set out in paragraphs 18 and 19. The DRPS ADS can be contacted on 01189 858080 during normal working hours and via the Institute of Naval Medicine main gate on 02392 768020 at all other times.

Suspected High Dose

21. Whenever it is suspected that the wearer of a dosemeter has received a significant unintended radiation dose, the dosemeter is to be returned to the ADS for urgent processing. Where practicable, the employer is to provide the ADS with advance warning by telephone or email that the dosemeter is being returned. Consideration must also be given to returning a dosemeter to the ADS for early processing when the results of control dosimetry indicate that the wearer may be approaching a MOD investigation level or a statutory dose limit (see Chapter 4). Such dosemeters are to be accompanied by a completed copy of their respective Issue Lists with the remarks column of the Issue List annotated accordingly. Furthermore, as a safeguard against irradiation of the dosemeters in transit, the outside of the package used to return the dosemeters is to be clearly labelled 'CAUTION - RADIATION DOSEMETERS - DO NOT X-RAY'.

Assessment of Radiation Doses from Intakes of Radioactive Material or Contamination of the Skin

22. Where a unit or establishment, in consultation with the RPA, decides that it is necessary to routinely conduct biological sampling or in-vivo monitoring for personnel working with unsealed radioactive substances, then written application is to be made to the ADS. Sampling / monitoring arrangements are to be agreed by the unit or establishment and the ADS.

23. The establishment will receive a report containing the assessed radiation dose resulting from the intake of radioactive material and, where appropriate, the information will be recorded on the individual's dose record held by the relevant Approved Dosimetry Record Keeping Service.

24. If an intake of radioactive material into the body is known or suspected, or if a person's skin becomes contaminated by a radioactive substance that is not readily removable by usual means, then a local investigation to assess the radiation dose is to be undertaken. The RPA must be involved in this investigation.

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

a. a record of the radiation dose sustained in the incident;

b. an estimate of the intake, or levels of skin contamination, and the radionuclide(s) involved;

c. the results of any biological monitoring and / or skin contamination monitoring; and

d. the circumstances of the intake or skin contamination incident, and methods of physical surveillance.

Radiation Overexposures

26. An overexposure means a person has received a dose of ionising radiation in excess of a relevant statutory dose limit (see Chapter 4).

27. When it is suspected that an overexposure has occurred, the employer must notify the HSE as soon as practicable.

28. The employer must also immediately undertake an investigation. The individual who has potentially received an overexposure must not be allowed to work with radiation until the results of the investigation are known. The individual is to be informed of these results.

29. Special medical surveillance may be necessary where an individual has received a radiation overexposure. The individual is to be referred to the Appointed Doctor, regardless of whether they are a classified person, as soon as practicable.

30. A copy of the investigation report is to be forwarded to the ADS. This record is to be kept indefinitely.

Dose Limitation for Overexposed Workers

31. The dose limitation for the remainder of a calendar year for an employee who has been overexposed in that year, and has not been withdrawn from radiation work on the recommendation of the Appointed Doctor, is the proportion of the calendar year remaining from the end of the dose assessment period in which the overexposure arose multiplied by the annual dose limit.

Dosimetry Records

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

a. Laboratory Certificates;

b. Radiation Dose Record Summaries;

c. Overexposure or Warning Reports;

d. Reports of investigations carried out to make special entries in the dose record (see Annex C for further details on special entries);

e. FMed 291F Health Record or the HSE Health Record Form F2067 (classified persons only);

f. Dose Transfer Records;

g. the results of dose assessments made while working under written arrangements and while not wearing dosemeters issued by the establishment's ADS;

h. Radiation passbooks for classified persons employed as outside workers;

i. any assessments of dose for non-classified persons working under written arrangements; and

j. copies of the results of any internal dose assessments.

33. For establishments keeping paper records, an FMed 291A envelope can be used to store the records for each individual.

Outside Workers

34. Persons required to carry out services in a supervised or controlled area designated by an employer other than their own are referred to as outside workers. Line Managers are to seek advice from the RPA on the circumstances in which persons should be designated as outside workers. The responsibilities and duties of the outside worker, their employer and the operator of the supervised / controlled area must be formally agreed before any work is undertaken.

35. Any classified person who fulfils the criteria for an outside worker will need an approved radiation passbook, while a non-classified person will need a radiation record summary card (ADS Form 132 or FMed 291D). These can be obtained from the ADS. These documents are to be kept up to date at all times by the persons authorised by the ADS or employer.

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

Compensation Scheme

37. 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 that may be linked with exposure to ionising radiation at work.

38. 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) as follows:

a. by mail: Compensation Scheme Executive Secretariat, Sellafield Limited, Sellafield, Seascale, Cumbria CA20 1PG.

b. by email: csrld.executive.secretary@sellafieldsites.com

c. by telephone: 01946 774716

39. It should be noted that former service personnel are also entitled to apply to Veterans UK, though any award would take account of compensation received from other sources. The contact details are:

a. by mail: Veterans UK, Ministry of Defence, Norcross, Thornton Cleveleys, Lancashire, FY5 3WP.

b. by email: veterans-uk@mod.gov.uk

c. by telephone: (UK only) 0808 1914 218, (overseas) +44 1253 866043

Medical Surveillance and Appointed Doctor

40. COs / HoEs 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 Appointed Doctor, must ensure that they have a registered medical practitioner available to carry out the duties of the Appointed Doctor.

41. The HSE maintains information for employers that includes a list of Appointed Doctors on its website at: http://www.hse.gov.uk/doctors/employers.htm.

42. For Service personnel, Appointed Doctor services should be available from within the Defence Medical Services – either from the Defence Primary Healthcare Service or from within single Service commands.

43. The Royal Navy is the lead Service for the provision of radiation medicine. Advice can be obtained from the Underwater Medicine Division at INM by the following means:

a. by mail: The Underwater Medicine Division
Institute of Naval Medicine,
Crescent Road,
Alverstoke, GOSPORT, Hampshire,
PO12 2DL

b. by email: NAVYINM-UMD@mod.gov.uk

c. by telephone: Working hours: Mil 9380 68241; Civ 02392 768241

d. emergencies: via the Duty Diving and Radiation Medicine Specialist on 07827 821980 or via INM main gate on 02392 768020.

44. The CO / HoE must ensure that the employees described in paragraph 40 are under adequate medical surveillance by an Appointed Doctor for the purposes of determining their fitness 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. a medical examination before first being designated as a classified person;

b. periodic health reviews, at least once per year;

c. special medical surveillance of an employee which may be necessary following the advice of an Appointed Doctor for any person that may have received an overexposure when a relevant dose limit has been exceeded;

d. determination of whether specific work conditions are needed; and

e. a review of health after cessation of work where this is necessary to safeguard the health of the individual.

45. Only persons with a valid, in date, Appointed Doctor's certification of fitness are to work as classified persons. IRR17 requires the state of health of all classified persons to be reviewed by an Appointed Doctor every 12 months, or after a shorter period as may have been specified at the time of last review. In practice, the review may be carried out from one month before to one month after the expiry date of the last entry on the health record. Where the Appointed Doctor certifies that an employee should be subject to certain conditions, the CO / HoE must ensure that work is carried out in accordance with those conditions.

46. Further guidance on medical surveillance is provided at Annex D.

Record Retention Periods

47. IRR17 specifies that the dose record of a classified person should be kept until the person has, or would have, attained the age of 75 years, but in any event for at least 30 years from when the record was made. Notwithstanding this statutory requirement, the MOD retains primary dose records indefinitely to allow it to defend itself against a variety of claims. Specific record retention periods are detailed in Table 1.

Records	Establishment	ADS
ADS issued Laboratory Certificates	2 years	Indefinitely
Radiation Dose Record Summary for classified person	2 years from the end of the calendar year to which the summary relates	Indefinitely (but not less than the statutory requirement)
Radiation Dose Record Summary for non-classified person	2 years from the end of the calendar year to which the summary relates	Indefinitely
Record of investigations carried out to make special entries in the dose record	2 years	Indefinitely (but not less than the statutory requirement)
FMed 291F Health Record or the equivalent HSE Health Record Form F2067	Indefinitely (but not less than the statutory requirement)	Not applicable

Termination Record	Copy provided to employee on leaving MOD employment	Indefinitely (but not less than the statutory requirement)
FMed 291A and contents for classified persons	Retained until employee moves establishment or leaves MOD employment, and then forwarded to next unit or ADS	Indefinitely (but not less than the statutory requirement)
FMed 291A and contents for non-classified persons	Retained until employee moves establishment or leaves MOD employment, and then forwarded to next unit or ADS	Indefinitely
Overexposure reports	2 years	Not applicable
Warning reports	2 years	Not applicable
Dose assessment made as a result of an accident or incident	Indefinitely (but not less than the statutory requirement)	Indefinitely (but not less than the statutory requirement)
Radiation Passbooks	Retained until employee moves establishment or leaves MOD employment, and then forwarded to next unit or ADS	Indefinitely (but not less than the statutory requirement)
Local dose assessments for non-classified persons using dosemeters not issued by the ADS	Indefinitely	Indefinitely

Note: Statutory requirement means until the person to whom the record relates has, or would have, attained an age of 75 years, or for 30 years from when the record was made, whichever is the later.

Table 1: Radiation Dosimetry Record Retention Periods

ANNEX A
TO CHAPTER 6
OF JSP 392

INFORMATION FOR RADIATION WORKERS ON PARTICIPATION IN THE NATIONAL REGISTRY FOR RADIATION WORKERS

Introduction

1. The National Registry for Radiation Workers (NRRW) is a long term study of ionising radiation workers that investigates if there is any difference in the pattern of diseases among those workers that can be linked to their occupational radiation exposure.

2. The aim of the study is to provide direct evidence about whether the UK radiation protection regulations appropriately protect workers and to inform the setting of future regulations.

Background

3. In 1976, the National Radiological Protection Board (now part of the UK Health Security Agency, UKHSA) set up the NRRW. The NRRW collects information about radiation workers, in particular on their radiation exposures but also other factors that affect disease risk. It also collects information on cancer incidences and deaths among the workers.

4. The NRRW now includes over 270,000 individuals who started radiation work from 1955 to the present day and are, or were, employed in the MOD, the civil nuclear industry, or in a number of smaller organisations in the research and industrial sectors. Once recruited the NRRW follows workers until their death (unless they choose to opt out).

Aims of the study

5. The aim of the NRRW is to investigate the effects of long term occupational exposure to radiation on the health of workers and assess whether radiation protection regulations provide an adequate level of protection for UK radiation workers.

6. This is done in two ways:

   a. by comparing the health of radiation workers to the general population; and

   b. by investigating if a relationship can be seen between workers' radiation doses and their cause of death or the rates of cancer incidence among them.

What information is provided to the study

7. A data sharing agreement that is compliant with the General Data Protection Regulation (GDPR) has been agreed between the MOD and the UKHSA to facilitate the lawful collection of MOD radiation worker data for the purpose of the NRRW.

8. The data collected comprises the following:

   a. name.

   b. sex.

c. name of employer.

d. date of birth and, if known, place of birth.

e. National Insurance Number.

f. National Health Service Number, if known.

g. history of occupational exposure to radiation.

h. information about any other occupational and environmental exposure conditions relevant to radiological health effects, e.g. asbestos, dust, solvents.

9. The personal identifying information is used to obtain information on any cancers an individual develops from the National Disease Registration Service or National Records for Scotland, and about what an individual eventually dies of from the Office of National Statistics. This information is then linked to the individual's occupational radiation dose history.

10. An individual's data will not be analysed alone but only as part of the whole group of radiation workers, so it is not possible to say anything from the study about an individual's risks.

11. All data are treated as confidential and are processed in compliance with the GDPR.

12. More detailed information about the study can be found on GOV.UK by searching for the word 'NRRW' or by following this link.

13. The GDPR compliant Privacy Notice for the study is at the link above.

14. There is also an email address (radiationworkerepidemiology@ukhsa.gov.uk) to contact the study team for more information or to opt out of the study at any time.

ANNEX B
TO CHAPTER 6
OF JSP 392

GUIDANCE FOR LINE MANAGERS AND EMPLOYEES ON TYPES OF DOSEMETER, DOSEMETER CARE, THE ADMINISTRATIVE ARRANGEMENTS FOR DOSIMETRY SUPPLY AND THE ASSOCIATED DOSIMETRY RECORDS

Introduction

1. The DRPS ADS is approved for radiation dose assessment and record keeping by the HSE. The scope of the services provided for persons registered with the DRPS ADS is summarised below:

a. the DRPS ADS will make and maintain dose records in accordance with the requirements of IRR17 and will keep those dose records (or a copy thereof) indefinitely. The onus is on the unit or establishment to furnish the DRPS ADS with completed record keeping registration forms (Personal Details Forms) to initiate this process. These forms will be provided by the DRPS ADS.

b. the DRPS ADS will provide personal dosemeters for the purpose of assessing radiation doses.

c. the DRPS 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 current calendar year.

d. the DRPS ADS will notify the unit or establishment by email or telephone, as well as in the form of a warning report, when any individual exceeds a UK statutory dose limit (see Chapter 4).

e. a warning report will be issued when an individual exceeds a MOD dose constraint or investigation level (see Chapter 4). A warning report will also be issued when a pregnant employee exceeds a whole-body radiation dose of 0.75 mSv over the declared term of the pregnancy, as this is approaching the MOD dose constraint of 1 mSv.

f. when a classified person ceases radiation employment, the employer must request a termination record from the ADS. The DRPS ADS will send that record to the employer or individual, as directed, and a copy to the HSE.

g. the DRPS ADS will, within 3 months of the end of each calendar year, send to the HSE summaries of all classified person dose records for that year.

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

i. 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, the DRPS ADS will enter the historical doses onto the DRPS Approved Dosimetry Record Keeping System. The unit or establishment is responsible for providing the DRPS ADS with a detailed breakdown of previous radiation exposures.

2. For persons such as casual visitors and persons working under written arrangements who are not registered with the DRPS ADS, the assessed doses will be provided on Laboratory Certificates. Radiation Dose Record Summaries will not be issued for these persons.

Commencement of Radiation Work

3. The following actions are to be taken by the unit or establishment for employees whose radiation doses are to be assessed and records maintained by the DRPS ADS:

a. submit a fully completed Personal Details Form to the DRPS ADS. Where appropriate, write 'New wearer – put on regular issue' in the Remarks / Changes Required column of the DRPS ADS Dosemeter Issue List.

b. for an employee who is becoming a classified person, the employer (CO / HoE) must:

(1) notify the employee, in writing, to that effect;

(2) arrange for a medical examination, if required, as described in Annex D;

(3) if the individual was previously employed as a classified person by a non-MOD organisation, obtain a copy of the termination record and forward it to the DRPS ADS. The individual should already be in possession of a copy; if not, a copy may be obtained from their previous employer or the HSE

(4) if the individual was previously employed as a classified person who wore DRPS ADS personal dosemeters, obtain the FMed 291A envelope containing dose records from the previous unit or establishment, or from the DRPS ADS; and

(5) if the individual will be employed as an outside worker, request a radiation passbook be issued to the individual by the DRPS ADS.

c. for non-classified personnel previously 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 DRPS ADS for inclusion on their current dose records.

Types of dose assessment provided by DRPS ADS

4. Line managers and employees are to be aware of the types of dosemeter available from the DRPS ADS. However, the RPA should provide the advice on which type of dosemeter 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 dosemeters.

5. The DRPS ADS supplies:

a. whole-body thermoluminescent dosemeters (TLDs);

b. emergency whole-body TLDs;

c. extremity TLDs;

d. combined photon and neutron dosemeters;

e. personal radon dosemeters;

f. environmental radon detectors;

g. tritium-in-urine sampling kits;

h. in-vivo monitoring (whole body, lung or thyroid).

6. Instructions are supplied by the DRPS ADS for the use of the above dosemeters.

7. Whole-body TLDs are used to assess the deep dose from gamma and X-radiations, as well as the skin dose from beta, gamma and X-radiations. Dosemeters can be provided for routine dosimetry (distinguished by a blue stripe on the dosemeter holder) or emergency dosimetry (white stripe).

8. Extremity TLDs are provided for assessing exposure from beta, gamma and X-radiations to the skin of the hands, forearms, feet and ankles.

9. Combined photon and neutron dosemeters are used to assess the deep dose from gamma, neutron and X-radiations, as well as the skin dose from beta, gamma and X-radiations.

10. Personal radon dosemeters are used to assess personal exposure to radon gas.

11. Environmental radon detectors are used to assess the radon gas concentration in workplaces and dwellings.

12. 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 DRPS ADS Radiation Dosemeters

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

14. Every effort must be made to prevent wilful or negligent misuse of radiation dosemeters.

Dosemeter Wear

15. Specific instructions are issued by the DRPS ADS on how each of the dosemeters is to be worn.

Care of Radiation Dosemeters

16. Individuals wearing DRPS ADS radiation dosemeters must take the following precautions:

a. wear the dosemeter according to ADS instructions.

b. wear the dosemeter whenever in a radiation area.

c. store the dosemeter in a low-background area, remote from any known sources of ionising radiation, when not being worn.

d. do not shield the dosemeter in any way. Pens, rulers or other metallic objects may shield the dosemeter.

e. if wearing a lead apron, the dosemeter is to be worn beneath the lead apron.

f. do not immerse the dosemeter in any liquid. Particular care is to be taken to remove dosemeters from clothing before laundering. Divers are to wrap their dosemeter in two plastic bags and wear the dosemeter inside their wet suit.

g. keep the dosemeter away from high temperatures, e.g. central heating pipes and radiators.

h. do not share the dosemeter with anyone else.

i. do not damage the dosemeter or holder in any way.

j. do not carry the dosemeter in close proximity to luminised watches or other luminised articles.

k. return the dosemeter promptly at the correct time, ensuring that a replacement is available before giving up the old one, if required.

l. notify the RSO or RPS immediately if a dosemeter 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.

m. ensure that the dosemeter is not worn inadvertently during medical / dental X-ray examinations when the individual is the patient.

17. For whole-body TLDs and combined dosemeters, consideration is to be given to encapsulating the dosemeter in polythene (approved by the DRPS ADS) whenever the dosemeter is worn in areas where:

a. significant contamination exists;

b. humid or damp conditions occur; or

c. corrosive or chemically reactive gases or vapours, including tear gas or hydrogen sulphide, are present.

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

Lost or Damaged Dosemeters

19. When dosemeters have been lost or damaged during the normal wear period, the unit or establishment is to annotate the Remarks / Changes Required column of the Dosemeter Issue List accordingly. The unit or establishment is to investigate the circumstances of the loss or damage of the dosemeter and provide an estimate of the dose to the DRPS ADS. The ADS will supply the appropriate form to be used for the provision of the estimated dose.

20. Where the unit or establishment has investigated the loss or damage of a dosemeter and no estimated dose can be provided, the DRPS ADS can 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 dosemeter 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, and with the agreement of the employer.

Irradiated Dosemeters

21. If it is suspected that a dosemeter has been inadvertently irradiated, the unit or establishment is to annotate the Remarks / Changes Required column of the Dosemeter Issue List accordingly. The unit or establishment is to investigate the circumstances and provide an estimate of the dose to the DRPS ADS. The ADS will supply the appropriate form to be used for the provision of the estimated dose.

Issue and Return of Dosemeters

22. The RSO or RPS is to coordinate all arrangements for personal dosimetry.

23. The normal wear periods for each type of personal dosemeter are detailed in Table A1. Dosemeters are normally to be worn starting from the calendar month for which they have been issued, unless advised otherwise by the RPA. Dosemeters are to be returned immediately to the DRPS ADS for analysis following receipt of the next issue.

Dosemeter Type	**Issue Period**
Whole-body TLD	1 or 3 months
Extremity TLD	1 or 3 months
Combined dosemeter	3 months
Radon dosemeter	3 months

Table A1: Period of wear for personal dosemeters

24. Dedicated emergency dosemeters, which are not to be used for routine personal monitoring purposes, are issued on a six-monthly basis by the DRPS ADS. They should only be used during an emergency intervention and then be returned to the DRPS ADS without delay for analysis.

25. All dosemeters (including those unused or damaged) are to be returned promptly for assessment to the DRPS ADS, together with the completed Dosemeter Issue Lists, at the end of the wear period. The returned Dosemeter Issue Lists are to be clearly annotated to indicate any changes that 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. Dosemeters that will not be used for the wear period are not to be returned early.

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

Completion of the DRPS ADS Dosemeter Issue List

27. Instructions for completing the Dosemeter Issue List are contained on the form itself. Further advice on completing the Dosemeter Issue List may be obtained from the DRPS ADS.

Issue of DRPS ADS Dosemeters to Personnel in Receipt of Dosemeters Issued by Another Employer

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

Casual Visitors

29. Units and establishments are to issue radiation dosemeters to casual visitors where specified in local orders. When a casual visitor is issued with a DRPS ADS personal dosemeter, the number 4 is to be entered into the 'Cat' code column of the DRPS ADS Dosemeter Issue List for the dosemeter.

Notification of Changes in Circumstances

30. A completed Personal Details Form is to be forwarded to the DRPS ADS when any of the following occur for personnel registered with the ADS:

a. there is a change in personal details such as surname on marriage, change of job as described in the job code, or change of service / pay number;

b. an individual restarts radiation work; or

c. an individual ceases to be a classified person. In such circumstances, a termination record for the individual is to be requested from the DRPS ADS and a forwarding address is to be provided to enable a copy of the termination record to be forwarded to the individual.

Completion of Radiation Work at an Establishment

31. The unit or establishment is to undertake the following tasks for each individual registered with the DRPS ADS who ceases radiation work at an establishment:

a. if the individual is leaving MOD employment, strike through their name on the pre-printed DRPS ADS Dosemeter Issue List and add the following text in the Remarks / Changes Required column: 'Left MOD – please take off regular issue'. If the individual is ceasing radiation work at an establishment but continuing employment with MOD, strike through their name on the pre-printed DRPS ADS Dosemeter Issue List and add the following text in the Remarks / Changes Required column: 'Posted / transferred – please take off regular issue'.

b. for classified persons leaving MOD employment, submit a Personal Details Form to the DRPS ADS requesting a termination record including a forwarding address and the date of employment termination.

c. for non-classified persons leaving MOD employment who require a radiation dose history, submit a Personal Details Form to the DRPS ADS including a forwarding address and the date of employment termination.

d. forward the individual's dose records and radiation passbook (if issued) to their next establishment if they are continuing to undertake radiation work within the MOD, or if not return the documents to the DRPS ADS.

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

Description of DRPS Approved Dosimetry Service Forms

32. The DRPS ADS provides dedicated forms to assist MOD personnel with the administration of dosimetry services. These forms, and related MOD medical documents, are as follows:

a. **Form FMed 291A (radiation history envelope)**. This envelope is provided for establishments to retain all relevant radiation dose records and associated documents. The unit or establishment must maintain a Form FMed 291A for classified persons or persons who have previously been designated as classified persons, and may also choose to use a FMED 291A to hold the radiation dose records for non-classified persons. On transfer of 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 the individual is to continue radiation work, or returned to the DRPS ADS.

b. **Personal Details Form (ADS Form 131 or FMed 291E)**. This form is used to register all radiation workers with the DRPS ADS. The form must be completed by the individual before any radiation dose assessments are undertaken. Full instructions are given on the form, which must be completed as fully as possible and forwarded to the DRPS ADS. Changes to occupational codes or classified status are also to be notified to the DRPS ADS using this form.

c. **Dosemeter Issue List**. The purpose of the Dosemeter Issue List is to ensure that the results of radiation dose assessments, as recorded by personal dosemeters, are incorporated in the correct radiation dose record. An Issue List is supplied with each batch of dosemeters. The Issue List contains details of the dosemeter type, dosemeter serial number(s), issue period and where appropriate, details of the dosemeter wearer(s). Generally, dosemeters that have not been pre-allocated to an individual

may be issued to visitors, newly posted individuals, or used for area monitoring purposes.

d. **Laboratory Certificate**. This form is issued to each unit or establishment following the assessment of returned dosemeters, or the input of internal dose assessments into the DRPS Approved Dosimetry Record Keeping System. The Laboratory Certificate provides a summary of all the dose assessments and should be used to review doses to individuals.

e. **Radiation Dose Record Summary**. The DRPS ADS issues these person-specific reports shortly after the end of each calendar quarter for all individuals who have been monitored during that calendar year. The Radiation Dose Record Summary report is forwarded automatically to the RSO / RPS / Dosimetry Coordinator. The form shall be available to the Appointed Doctor, and may be inspected on request by the individual to whom it refers.

f. **ADS Form 94 or an ADS generated ADS3**. This form is used to provide the DRPS ADS with an estimated dose in the event that a dosemeter is lost, damaged or inadvertently irradiated.

g. **DRPS ADS Warning Reports / Overexposure Reports**. In addition to Laboratory Certificates of dose results provided to each customer, the DRPS ADS also provides Overexposure Reports and Warning Reports for any person registered with the ADS who has exceeded a relevant dose threshold. These reports are dispatched with the Laboratory Certificates.

h. **Radiation Record Summary Card (ADS Form 132 or FMed 291D)**. This form must be completed by the parent establishment and issued to non-classified persons undertaking work in a controlled area designated by another employer. It shall carry the PD number (Personal Dosimetry number, a unique identification number allocated to an individual by the DRPS ADS) of its bearer. The RSO or RPS issuing dosemeters for the controlled area shall examine this card, using the PD number as necessary, and complete the appropriate columns before the individual returns to their normal MOD station.

i. **Radiation Passbooks**. Radiation passbooks are issued to classified persons who are required to undertake work in a controlled area designated by another employer. They are available from the DRPS 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.

j. **Termination Records**. The employer has a statutory duty to ensure that the DRPS ADS raises a termination record whenever a person who is, or has been, designated a classified person leaves MOD employment. The termination record summarises the radiation exposure for the individual during the period of employment. Requests for termination records are to be made by completing a Personal Details Form for the individual and then forwarding this form to the DRPS ADS. The form must include details of a forwarding address for the individual and date of termination of employment. The DRPS 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 IRR17.

ANNEX C
TO CHAPTER 6
OF JSP 392

GUIDANCE FOR LINE MANAGERS AND EMPLOYEES ON SPECIAL ENTRIES

Introduction

1. The ADS will amend dose records in accordance with the special entry arrangements specified in IRR17. 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. Whenever there is reasonable cause to believe that the dose received by an individual is much greater than, or much less than, the radiation dose recorded on a Laboratory Certificate issued by the ADS, 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:

a. application is to be made to replace the assessed dose with a special entry to the individual's dose record. Full details of the investigation together with a completed ADS Form 94 (Estimated Dose Form) are to be submitted through normal channels to the appropriate TLB safety authority for radiation safety, for approval and onward transmission to the ADS. For those establishments with a resident full time RPA, application for a special entry is made by submitting full details of the investigation together with a completed estimated dose form to the RPA, for onward transmission to the ADS, with a copy being sent to the appropriate TLB safety authority. A copy of the investigation report is to be retained locally for at least 2 years; and

b. consent for a special entry is required from the HSE in any case where the cumulative recorded dose exceeds a relevant statutory dose limit (see Chapter 4).

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

3. An estimate of the dose received is to be regarded as much greater than, or much less than, the original entry in the dose record for a particular period where:

a. for recorded doses of 1 mSv or less, the dose received differs from the original entry in the dose record by at least 1 mSv; or

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

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

Adequate Investigation

4. 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:

a. relevant information provided by the ADS;

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

c. measurements from any additional dosemeter or direct reading device worn by the person concerned;

d. individual measurements made on other employees undertaking the same work with ionising radiation; and

e. the results of any area monitoring that has been undertaken.

5. In addition, it is worth considering:

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

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

c. the reliability of engineering controls, design features, safety features and warning devices specifically provided to restrict exposure.

d. details of any radiation monitors / alarms and their reliability.

e. training records and experience of employees.

f. arrangements for storage / security of dosemeters against risks of contamination or inadvertent / malicious exposure.

g. systems of receipt and handling of dosemeters including the use of security X-ray devices at the unit or establishment.

Approved Dosimetry Service Action

6. The 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 IRR17. In such circumstances, the ADS will request more information to support the case.

7. When the information provided is adequate, the ADS will perform the requested dose replacement.

8. A revised Laboratory Certificate will be provided to the unit or establishment following the dose amendment.

9. A revised Radiation Dose Record Summary will be provided to the unit or establishment for the individual concerned during the relevant quarter in which the amendment was made.

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

Employee Consultation

11. The individual concerned must be consulted during the investigation and notified of any special entry proposed. If a classified person is aggrieved by the decision to apply for a special entry, they can request the HSE to review that decision within 3 months of being informed.

12. 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.

ANNEX D
TO CHAPTER 6
OF JSP 392

GUIDANCE FOR LINE MANAGERS AND EMPLOYEES ON MEDICAL SURVEILLANCE OF 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 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. In publication MS33, the HSE publish 'Guidance for Appointed Doctors on the Ionising Radiations Regulations 2017'. (www.hse.gov.uk/pubns/ms33.pdf)

Medical Surveillance

2. The Appointed Doctor 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.

3. At the initial medical examination, a description of the work to be undertaken is required and past medical, family and occupational and social histories should be taken. These details must then be recorded together with the results of a physical examination. For Service personnel who consent, this record should be in their electronic medical record. HSE form MS 101 can be used as a template. No medical tests or examinations are routinely required before an initial medical examination, but the Appointed Doctor is free to require whatever evidence or investigations they may need to make an assessment of fitness. The final outcome certifying the result of the assessment is to be recorded in the Health Record (HSE form 2067).

4. IRR17 requires the state of health of all classified persons to be reviewed by an Appointed Doctor every 12 months, or after a shorter period as may have been specified at the time of the last review. In practice, the review may be carried out from one month before to one month after the expiry date of the last entry on the health record. It will be treated as if carried out on that expiry date. The next periodic review would normally be due 12 months after that date. Where a period of more than 13 months has passed since the start of the current period of validity, the Appointed Doctor should carry out a medical examination.

5. The nature of the review is a matter for the Appointed Doctor using HSE guidance and clinical judgement, taking account of the nature of the work and the individual's state of health.

6. Where there is an enhanced risk of radiation exposure (e.g. site radiography, or people working in areas of significant surface or airborne radioactive contamination), the review will often include a face-to-face assessment. Even when the work environment is well controlled and low risk, a face-to-face assessment at least once every 5 years should be considered.

Special Medical Surveillance

7. The Appointed Doctor may be required to conduct special medical surveillance on any worker who has received a radiation dose in excess of a relevant statutory dose limit detailed in Chapter 4. In these circumstances, the Appointed Doctor should contact an HSE medical adviser to discuss the case. The Appointed Doctor and HSE medical adviser will then work together to determine the content of the special medical surveillance. It should include a medical assessment, counselling and details of possible restrictions on further exposure.

Suspension from Employment as a Classified Person

8. The Appointed Doctor 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 Appointed Doctor is to notify line management of any suspension.

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 Appointed Doctor in the health record.

10. Where full suspension is deemed unnecessary, the Appointed Doctor 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 / HoE only under the prescribed restrictions.

11. IRR17 makes provision for a person who is aggrieved by a decision of an Appointed Doctor to apply for the decision to be reviewed by the HSE. Such an application should be made in writing to the HSE's Principal Medical Adviser within 28 days of being informed on the decision. Details of the appeals procedure are on the HSE's website.

Transfer of Establishment for Classified Persons

12. If a classified person moves unit, unless the move entails a significant change in duties or environment, or unless there has been a relevant change in the person's medical history, the person can continue to be employed under the terms of any extant certification. Advice must be obtained from the Appointed Doctor before the person starts work in all cases of doubt.

Statistical Returns

13. Appointed Doctors may be required to submit statistical returns upon request from the HSE.

Pregnancy and Breastfeeding

14. Every radiation worker must be reminded that they are to notify their employer, in writing, that they are 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:

a. the equivalent dose to the foetus is not likely to exceed 1 mSv during the remainder of the pregnancy; and that

b. in the case of an employee who is breastfeeding, the conditions of exposure are restricted to prevent significant bodily contamination of that employee.

15. Units and establishments are to inform the ADS by annotating the Remarks/Changes Required column of the Dosimetry Issue List with the date that the pregnancy was declared and the expected date of delivery.