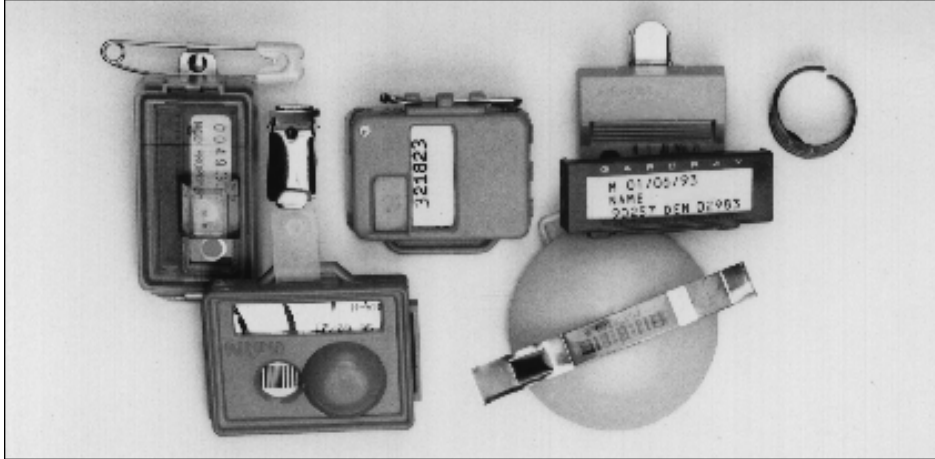




Radiation doses - assessment and recording

Ionising Radiation Protection Series No 2 (revised)



Typical dosimeters

Introduction

If you are a manager of people who work with ionising radiations, or you are self-employed and carry out such work, this HSE information sheet is for you. It gives advice on the need to assess radiation doses under the Ionising Radiations Regulations 1999 (IRR99) and supporting guidance.^{1,2} Reliable dose information is essential to help you ensure that employees' exposure is properly controlled and dose limits are not exceeded.

For people you have classified under regulation 20 IRR99 you must engage an Approved Dosimetry Service (ADS) to make systematic assessments of all radiation exposures that are likely to be significant. Dose records for classified persons must be held by an ADS specifically approved to keep such records (regulation 21 IRR99). There are additional requirements for employees who are 'outside workers' (ie classified persons who work in controlled areas designated by other employers).

You also need to monitor the doses of other people who enter your controlled areas and keep a suitable record of such doses. The purpose is to show that those individuals are not exposed to radiation above certain levels (regulation 18 IRR99). Monitoring such doses might involve an approved dosimetry service, the radiation protection adviser (RPA) or other suitable experts.

Selection of an ADS

Dosimetry services may be approved to carry out one or more specific functions and it is important that you engage the right type(s) of service for your needs. Your RPA can advise you about the type of radiation

exposures you need to have assessed and the types of ADS whose services you need. ADS are available for:

- assessing doses from external radiation (eg X-rays, gamma rays, beta particles or neutrons) for the whole body or parts of the body and reporting results to ADS (record-keeping);
- assessing doses from internal radiation from inhaled, ingested or absorbed radionuclides and reporting results to ADS (record-keeping);
- assessing doses following an accident, occurrence or incident and reporting results to the employer (regulation 23(1)(a) IRR99), and to ADS (record-keeping);
- making, maintaining and keeping dose records for classified persons, providing copies of dose records, suitable summaries and extracts (including 'termination records') and co-ordinating individual dose assessments of other ADS where appropriate.

The scope of the service is shown in their certificate of approval.

You will need at least one service approved for dose assessment and another which is approved for dose record keeping (the same organisation might be approved for both functions). Any service approved for measurement and assessment of doses should provide you with clear advice on the use of any dosimeter, device or other equipment it supplies for making measurements and assessing dose. You need to make sure that you and your employees follow this advice carefully.

Some dosimeters (eg electronic direct-reading dosimeters) or devices such as personal air samplers may be issued on a daily basis but typically dosimeters such as film badges and TLDs (thermoluminescent dosimeters) are normally issued on a monthly basis (but may be issued for up to three months where expected doses are very low).

HSE has a list of ADS which can be obtained from: Dosimetry Services Administrator, Technology Division, Magdalen House, Stanley Precinct, Bootle, Merseyside L20 3QZ Tel 0151 951 4027/4867.

What do you need to tell your ADS?

The arrangements you have made with your approved dosimetry service(s) will only be effective if you provide appropriate information (regulation 21(4) IRR99). They will ask you for such details as:

- personal data about each classified person (eg name and national insurance number, occupational category, date of starting work as a classified person with that employer) required to construct proper dose records;
- any records of doses you may have for each person you are designating as a classified person or details of the approved dosimetry service formerly responsible for holding records for that employee (if known);
- which classified persons have been issued with particular numbered dosimeters, devices etc in the current dose assessment period, when these dosimeters or devices are returned to the ADS for measurement and assessment;
- any classified persons who have lost, mislaid or damaged their dosimeter (or other device) and for whom dose estimates are being supplied (regulation 22(1) IRR99) or who did not wear their dosimeter (or device) during the relevant assessment period because they were on holiday or were not exposed to ionising radiation;
- any classified persons who, after investigation, are found to have received a dose much greater than/much less than that recorded in their dose record for the period and for whom the employer is providing supporting information for a special entry (regulation 22(3) IRR99); and
- any employee who terminates employment or ceases to be a classified person as permitted by regulation 20 IRR85.

In general, this information is required to comply with regulation 21(4) IRR99.

Care and use of dosimeters

You need to make sure that your employees receive adequate training and instruction about the care and proper use of dosimeters etc you provide so they know how and when to wear them, look after them properly and return them on time. Make formal arrangements for issue, out-of-hours storage and timely return of dosimeters and firmly discourage misuse or malicious interference. Make sure employees can clearly distinguish your dosimeters from any provided by another employer such as the operator of a site on which your employees work. You should advise your employees that they have legal responsibilities under regulation 34 IRR99 to co-operate with you on the proper use of dosimeters, when they know and understand what is required.

Provide suitably secure storage locations for dosimeters not being worn, in a low radiation area away from contamination, chemicals, hot pipes, non-ionising radiation etc which might affect them (advice from the ADS should tell you what to avoid). Dissuade employees from storing dosimeters in overalls, toolboxes or other places where they may be inadvertently exposed to ionising radiation when not being worn - see HSE pocket card.³

Make sure dosimeters are not screened by X-ray surveillance equipment such as mail/package monitors otherwise they may register an incorrect dose. Make sure that used dosimeters are returned in packages clearly labelled as containing radiation-sensitive materials. At the end of each issue period give the ADS an accurate list of those employees who wore each numbered dosimeter - identify any late, lost, damaged or contaminated dosimeters. Follow up any missing or late dosimeters promptly.

Mislaid, lost or damaged dosimeters

Dose records for classified persons must be complete. Therefore, the ADS will pursue you for any late dosimeters. If a dosimeter is lost or damaged, or the dose received can't be properly assessed for other reasons, give details to the ADS immediately; don't wait until you return the whole batch of dosimeters.

Carry out an investigation (regulation 22(1) IRR99), which should normally involve your RPA, and involve any appointed safety representative. This should help you estimate the dose actually received. Ask the ADS to record this estimate in the dose record and supply the ADS with a summary of the investigation report on which the estimate was based. If an estimate can't be made a notional dose should be recorded but this should only be used as a last resort. In the vast majority of cases it should be possible for the employer to make an estimate of the dose received by the person during the dose assessment period.

Internal dose

Your RPA may advise that you need an ADS to assess doses received from intakes of radionuclides. Doses may have to be assessed by one or more techniques, eg urine analysis, whole body/organ monitoring or personal air sampling. Ensure you understand what is required by the ADS so doses can be properly assessed and arrange for individuals to provide samples or report for monitoring as necessary.

Dose records

The ADS responsible for keeping and maintaining dose records should:

- record doses reported by each ADS (assessment) you engage;
- keep records for 50 years (or until the person has reached the age of 75 if longer);
- provide regular summaries so you can check that doses are under proper control and keep employees informed about their exposure (hold on to these summaries for at least two years);
- send annual summaries of recorded doses to HSE's Central Index of Dose Information (CIDI);
- draw up a 'termination record' when you tell them a classified person is leaving your employment; and
- warn you if doses exceed or approach dose limits so you can investigate.

Don't assume the ADS supplying your dosimeters will keep dose records for your classified persons - make sure you have agreed arrangements with an ADS (record-keeping)!

Make sure your employees know this dose information is being kept by your ADS (and by CIDI in summary form) and that they are entitled to see copies (regulation 21(6) IRR99 and the Data Protection Act 1998) - see the paragraph under 'Informing employees'. Send your ADS accurate information when requested (regulation 21(4) IRR99). Also, tell your ADS when a classified person leaves your employment and obtain a termination record to give that employee.

Getting the best from dose summaries

The dose summaries referred to above, under 'Dose records', should provide you with valuable information, helping you to identify (and if necessary investigate) whether particular individuals are receiving significantly higher doses than the norm, doses are tending to increase in time or doses are approaching a formal investigation level. This may point to a need for further training, a review of working conditions or even an investigation of a previously unidentified accident.

Dealing with incorrect recorded doses

If you suspect a classified person's dose was really much greater/less than that recorded you should investigate (regulation 22 IRR99) - your RPA and ADS should help and it is usual to involve the safety representative. If your suspicions are confirmed and there is adequate information to estimate the dose actually received, you should normally arrange for your ADS to replace the recorded dose with the estimate (marking it as a special entry in the dose record).

The ADS should also be given an adequate summary of the information you used to estimate the dose that person received - this has to be retained for the lifetime of the dose record. Don't delay and make sure you inform the employee concerned. HSE has produced more detailed advice on what to do about special entries;⁴ ask your ADS or see HSE's web site.

However, HSE must consent to a special entry if the cumulative whole body dose in the record is 20 mSv or more in the year so far or if a relevant dose limit has been reached or exceeded. In these cases contact HSE straightaway (see the phone book for the address).

Overdoses

Overdoses are serious but should not lead to the suspension of an employee from radiation work, unless this is the advice of the appointed doctor. If you suspect an overdose has occurred investigate it immediately (regulation 25 IRR99). Where it can't be ruled out, notify HSE and the appointed doctor and instigate a thorough investigation with the help of your RPA and ADS - involve any appointed safety representative. If the overdose is confirmed the employee will need a pro-rata dose limit for the remainder of the year. If the person is not your employee you will need to tell his or her employer as soon as possible.

Informing employees

Employees are entitled to see copies of their own dose summaries and termination records (regulation 21(6) IRR99) and it is good practice to provide such information automatically. Employees can also request a copy of their full dose record, which should be obtained from the ADS (record-keeping) within a reasonable period of any such request.

Outside workers

Any of your employees who are 'outside workers' will need an approved radiation passbook. If they don't have a current passbook you will need to arrange for your ADS (Records) to issue one. You should ensure the passbook is kept up to date. If your outside worker works in Northern Ireland or another part of the European Union, you should continue their dose assessment and ask your ADS to maintain a continuing record.

If you allow outside workers or other employees to enter or work in your controlled areas you 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. Your RPA should be able to advise you. Speed is important and quick estimates which overstate the dose are better than more accurate estimates which take weeks to make.

For external radiation direct-read or locally read dosimeters such as TLDs would normally be appropriate. For internal radiation personal (or where appropriate static) air samplers, area measurements, direct external monitoring of the thyroid (in the case of work involving radioactive iodine, or biological monitoring, eg for tritium) would be appropriate. Further guidance on requirements for outside workers is available.⁵

Short-term and self-employed workers

Some employees designated as classified persons may only work on a short-term contract basis, eg industrial radiographers. It is vital you let your ADS know immediately if you take on such employees - even if employment is just for a few days. It is wise to find out the individual's dose history before you employ them - you need to know if dose limits or investigation levels could be exceeded. Your ADS (record-keeping) can find out for you. Also, you need to check that they have been declared fit for the work with ionising radiation by an appointed doctor and arrange to open a health record and a dose record for them.

Self-employed persons are responsible for making their own arrangements with an ADS for dose assessment and dose recording under IRR99.

References

- 1 *Ionising Radiations Regulations 1999* SI 1999/3232 Stationery Office 2000
- 2 *Work with ionising radiation. Ionising Radiations Regulations 1999. Approved Code of Practice and guidance* L121 HSE Books 2000 ISBN 0 7176 1746 7

- 3 *Wear your dosimeter* Pocket card INDG205(C) and Poster INDG206(P) HSE Books 1995.
- 4 *Special entries in dose records* HSE Information Document. On the Health Directorate Web Site <http://www.hse.gov.uk/hthdir/spacent.htm>
- 5 *Protection of outside workers against ionising radiation* Ionising Radiation Protection Series No 4 HSE Books 2000

While every effort has been made to ensure the accuracy of the references listed in this publication, their future availability cannot be guaranteed.

Further information

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA. Tel: 01787 881165 Fax: 01787 313995.

HSE priced publications are also available from good booksellers.

Stationery Office publications are available from The Publications Centre, PO Box 276, London SW8 5DT. Tel: 0870 600522 Fax: 0870 6005533. They are also available from bookshops.

For other enquiries ring HSE's InfoLine Tel: 08701 545500, or write to HSE's Information Centre, Broad Lane, Sheffield S3 7HQ.

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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<http://www.hse.gov.uk>

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