

NUCLEAR SAFETY DIRECTORATE - BUSINESS MANAGEMENT SYSTEM	
<b>SITE INSPECTION AND ENFORCEMENT IONISING RADIATIONS REGULATIONS 1999 ON SITES REGULATED BY NSD</b>	<b>T/INS/037</b>
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## 1. Purpose & Scope

- 1.1 The purpose of this guidance is to facilitate a consistent approach to compliance inspection with respect to the Ionising Radiations Regulations 1999 (IRR 99) and to provide assistance to NSD site inspectors while carrying out their duties in this area.
- 1.2 The guidance does not indicate when or to what extent compliance inspections should be carried out as these matters are covered in individual site inspection programmes and at the inspector's discretion. Although key features are discussed, additional aspects may need to be examined.
- 1.3 It is not anticipated that all the topics recommended for consideration by the site inspector will be covered in a single inspection. Some aspects (eg documentary information) need not necessarily be inspected on site.
- 1.4 The Guidance is set out in 5 sections as below.
  - Section 2: IRR 99 - The Regulations
  - Section 3: Purpose of IRR 99
  - Section 4: Guidance on Arrangements made under IRR 99
  - Section 5: Guidance on Inspection of Arrangements made under IRR 99
  - Section 6: Guidance on Inspection of Implementation of Arrangements made under IRR 99
- 1.5 It is important to note that IRR 99 apply to a range of practices and work with ionising radiation undertaken at any site whether it is an nuclear licensed site or not. NII has regulatory responsibility for IRR 99 at nuclear licensed sites, certain non-licensed sites (eg Faslane) and also just outside nuclear sites (eg Devonport Dockyard which is adjacent to the licensed site).
- 1.6 **In Section 6 a distinction is made between those topics which are likely to be suitable for planned compliance inspection by the site inspector, and those which may be suitable for referral to a specialist NSD radiological protection assessor.** However, any topic may be referred to a specialist assessor at the discretion of the site inspector.
- 1.7 Site inspectors should note that IRR 99 aspects can also be included in planned compliance inspection against Licence Conditions (eg LC 8 – Warning Notices; LC10 – Training; LC 11 – Emergency Arrangements; LC12 – DAPs and SQEPs; LC25 – Operational records and LC26 – Control and supervision of operations; LC28 – Maintenance).

## 2. IRR 99 - The Regulations

- 2.1 The Ionising Radiations Regulations 1999 (IRR 99) are set out, together with the Approved Code of Practice (ACoP) and Guidance in the HSE document "Work with Ionising Radiation, Ionising Radiations Regulations 1999" ISBN 07176 17467. Inspectors should consult this document in preparing for and carrying out their compliance inspection.
- 2.2 The document covers all 41 regulations (with supporting ACoP and Guidance for each one), 9 Schedules and 3 Appendices.
- 2.3 The Regulations themselves are available on the internet at <http://www.legislation.hmsso.gov.uk/si/si1999/19993232.htm>
- 2.4 IRR 99 apply to a range of practices and work with radioactive material as set out in Regulation 3. They apply to all sites regulated by NII.
- 2.5 The terms used in the Regulations, ACoP and Guidance are defined in Regulation 2 and are not repeated here.

### **3. Purpose of IRR 99**

- 3.1 The Regulations require all steps to be taken in order to ensure that radiation exposures to workers and members of the public are ALARP. This is achieved by imposing duties on employers to protect employees and other persons against ionising radiation arising from work with radioactive substances and other sources of ionising radiation, and by imposing certain duties on employees.
- 3.2 These Regulations supersede and consolidate the Ionising Radiations Regulations 1985 and the Ionising Radiations (Outside Workers) Regulations 1993.

### **4. Guidance on Arrangements made under IRR 99**

- 4.1 Brief guidance is given below for each of the seven parts of IRR99.

#### **4.2 Part I (Interpretation and General - Regulations 1 - 4)**

This defines the terms used in and the scope of the Regulations. For the purposes of the Regulations, an employer includes a self-employed person and an employee includes a self-employed person and a trainee.

#### **4.3 Part II (General principles and procedures - Regulations 5 -12)**

The Regulations:

- 1) prohibit the carrying out of specified practices without the authorisation of HSE;
- 2) require specified work with ionising radiation to be notified to HSE;
- 3) require Radiation Employers to make a prior assessment of the risks arising from their work with ionising radiation, to make an assessment of the hazards likely to arise from that work and to prevent and limit the consequences of identifiable radiation accidents;
- 4) require Radiation Employers to take all necessary steps to restrict, so far as is reasonably practicable, the extent to which employees and other persons are exposed to ionising radiation;

- 5) require respiratory protective equipment used in work with ionizing radiation to conform with agreed standards and require all personal protective equipment and other controls to be regularly examined and properly maintained;
- 6) impose limits (specified in Schedule 4) on the doses of ionising radiation which employees and other persons may receive;
- 7) require in certain circumstances the preparation of contingency plans for radiation accidents which are reasonably foreseeable.

#### 4.4 **Part III (Arrangements for the Management of Radiation Protection - Regulations 13 -15)**

The Regulations require that Radiation Employers consult Radiation Protection Advisers in respect of matters specified in Schedule 5 and that employers ensure that adequate information, instruction and training is given to employees and other persons. Employers are required to co-operate by exchanging information to enable compliance by others with requirements to limit the exposure of employees to ionising radiation.

#### 4.5 **Part IV (Designated areas - Regulations 16-19)**

The Regulations require that areas in which persons need to follow special procedures to restrict exposure or in which persons are likely to receive more than specified doses of ionising radiation be designated as controlled or supervised areas, and that special arrangements be in place.

#### 4.6 **Part V (Classification and monitoring of persons - Regulations 20-26)**

The Regulations require that:

- 1) employees who are likely to receive more than specified doses of ionising radiation be designated as classified persons;
- 2) doses received by classified persons be assessed by one or more Dosimetry Services approved by HSE;
- 3) records of such doses are made and kept for each such person.

The Regulations also include requirements for medical surveillance and investigation, notification and dose limitation in the event of overexposures.

#### 4.7 **Part VI Arrangements for the Control of Radioactive Substances, Articles and Equipment - Regulations 27 -33)**

The Regulations:

- 1) require that where a radioactive substance is to be used as a source of ionising radiation, it should, whenever reasonably practicable, be in the form of a sealed source;
- 2) require any articles embodying or containing radioactive substances are suitably designed, constructed, maintained and tested;
- 3) cover the accounting for, keeping and moving of radioactive substances and require that incidents in which more than specified

quantities of radioactive substances escape or are lost or stolen be notified to HSE;

- 4) impose duties on manufacturers etc. and installers of articles for use in work with ionising radiation to ensure that such articles are designed, constructed and installed so as to restrict, so far as is reasonably practicable, exposure to ionising radiation;
- 5) impose similar duties upon employers in relation to equipment used for medical exposures together with additional duties in relation to the testing and safe operation of such equipment;
- 6) require employers to investigate any defect in medical equipment which may have resulted in a person receiving a dose of ionising radiation much greater than was intended and to notify the Executive of such incidents;
- 7) prohibit interference with sources of ionising radiation.

#### **4.8 Part VII (Duties of employees and miscellaneous - Regulations 34-41)**

The Regulations impose duties upon employees engaged in carrying out work with ionising radiation and also:

- 1) provide for the approval of dosimetry services by HSE;
- 2) provide for a defence on contravention of certain regulations;
- 3) provide for exemptions to be granted by the Executive;
- 4) extend the provision of the Regulations outside Great Britain;
- 5) contain transitional provisions; and
- 6) introduce modifications relating to the Ministry of Defence.

### **5. Guidance on Inspection of Arrangements made under IRR 99.**

5.1 The following guidance is neither exclusive nor exhaustive and will be subject to review and revision in the light of operational experience. Good practice elements may exceed the minimum compliance requirements.

5.2 Radiation Employers (eg Licensees) should be able to refer to documentation showing how they discharge their duties under IRR99 including:

- Prior Risk Assessment (Reg 7)
- Restriction of Exposure SFAIRP (Reg 8)
- Provision of PPE (Reg 9)
- Contingency Plans (Reg 12)
- Appointment of RPA (Reg 13)
- Local Rules and Appointment of RPSs (Reg 17)
- Arrangements with one or more Approved Dosimetry Service (ADS) for dose assessment and recording (Reg 21)

- Arrangements for medical surveillance of classified persons (Reg 24)
- Control of Sources (Regs 27 – 29)
- Investigations and Notifications (Regs 25, 30)

5.3 Licensees and site operators often refer to a compliance matrix, which sets out the procedures and documents that secure compliance with each Regulation, together with the person responsible. Such a matrix is likely to be similar to that relating to compliance with Nuclear Site Licence conditions.

5.4 Licensee's arrangements are often set out in generic rules (eg "Radiological Safety Rules") that are intended to deliver compliance with IRR 99. These are typically produced by the Licensee centrally, and implemented at each site via lower tier procedures and instructions. Inspectors should seek to ensure that such documents are included in arrangements for document control and are regularly reviewed to reflect the requirements of IRR99.

## **6. Guidance on Inspection of Implementation of Arrangements made under IRR 99**

6.1 It is for inspectors to apply their experience and discretion to determine the extent and depth of a particular inspection, taking due account of a number of factors such as safety significance, complexity and technical specialism.

6.2 Guidance is given here on some of the key requirements. In deciding which relevant arrangements to sample, inspectors should consider reported information or events on the site or at other sites, and the findings of licence compliance inspections (eg LC 8 – Warning Notices; LC 11 – Emergency Arrangements; LC12 – DAPs and SQEPs; LC28 – Maintenance).

6.3 A distinction is made between those topics which are likely to be suitable for planned compliance inspection by the site inspector, and those which may be more suitable for referral to a specialist assessor. However, any topic may be referred to a specialist assessor at the discretion of the site inspector.

6.4 A range of HSE guidance on specific aspects of IRR99 is readily available (eg via the HSE website). This is listed at Appendix 2. Site inspectors should be aware of and follow this guidance.

6.5 Where site inspection indicates that a Licensee's arrangements fall significantly short of IRR 99 requirements, and especially where enforcement action appears to be required under the Enforcement Management Model (OC 130/11), the site inspector should seek advice and support from a specialist NSD radiological protection assessor.

### **TOPICS LIKELY TO BE SUITABLE FOR PLANNED COMPLIANCE INSPECTION**

#### **Regulatory Duties**

6.6 The Regulations draw a distinction between the terms 'Employer' and 'Radiation Employer', the latter being an employer who carries out work with ionising radiation. Hence there are additional duties on those employers who carry out work with ionising radiation. On a nuclear site there could be employers who are not radiation employers e.g. certain contractors.

- 6.7 The IRR 99 duties on the employer are also imposed on the holder of a nuclear site licence, as far as the work relates to the licensed site (Reg 4(3)). The licensee will almost certainly be a radiation employer so that the IRR 99 duties on the radiation employer will also apply to the licensee. Hence the IRR 99 duties on other employers and radiation employers on a licensed site are also on the licensee. As a result a licensee will have IRR 99 duties for persons on site who are employed by other employers.
- 6.8 The Licensee (a corporate body) normally appoints individuals to specific posts, defined in their corporate arrangements or in regulations, with specific responsibilities for carrying out the regulatory duties on behalf of the corporate body. At nuclear licensed sites, the duties of the Radiation Employer are normally discharged by the most senior person on the site (Site Director, Station Manager etc) who also usually fulfils the role of Agent of the Licensee.
- 6.9 Site inspectors should consider holding discussions with Duty Holders - notably Radiation Employers, Nuclear Site Licensees, site operators, Employers (eg contractors) and employees, as well as RPAs and RPSs, to ensure that they understand their duties under the Regulations.
- 6.10 Site inspectors should discuss the Licensee's / site operator's own arrangements for regularly auditing compliance with IRR99.

### **The Radiation Employer**

- 6.11 It is suggested that inspections include an interview with the appropriate person(s) identified in the corporate arrangements (see 6.7) to confirm that they accept and understand their regulatory duties and responsibilities under the Regulations as set out in 5.2 above.
- 6.12 Copies of appointment letters for RPAs and RPSs should be available and should include the scope of their appointment.
- 6.13 The appropriate person(s) should be able to demonstrate that they have sought and acted on advice from a number of sources including their appointed RPA(s), their professional health physicists, and the Nuclear Safety Committee.

### **The Nuclear Site Licensee**

- 6.14 Inspectors may choose to confirm that the Licensee has adequate arrangements in place to ensure that duties under IRR 99 are discharged in respect of contractors working on the site. For example, the Licensee should have arrangements in place to ensure that contractors working on the site are given adequate instruction, information and training (eg via induction training) and for ensuring that contractors are classified, as appropriate, for the purposes of dose assessment and recording.

### **The Employer**

- 6.15 All employers (notably contractors at nuclear sites) have responsibilities under IRR 99 for dose investigation (Reg 8(7)), dose limitation (Reg 11), training etc (Reg 14), Co-operation between employers (Reg 15) and classification / monitoring (Regs 20 – 24).

- 6.16 Additional duties are placed on those in control of, or who designate, areas ((Regs 16,18 and 19), and those in control of equipment (Reg 32(1) to (5)).
- 6.17 Inspectors may consider interviewing contractors' staff to ensure that adequate arrangements are in place for co-operation with the Licensee and for discharge of these responsibilities.

### **The Employee**

- 6.18 Inspectors should be aware that employees have the following duties under IRR 99 (Reg 34):
- Avoid unnecessary exposure to radiation
  - Make proper use and look after PPE
  - Take care of radiation passbook
  - Comply with contingency plans and dose assessment arrangements
  - Comply with medical surveillance arrangements
  - Notify employer of incidents.

### **The RPA**

- 6.19 On most nuclear sites, the RPA function is provided in-house, typically by one or more members of the radiological safety function on site. Individuals may be appointed to fulfil only a limited number of responsibilities, with other functions being fulfilled by other appointed individuals (who may or may not be based on the site). All individuals appointed in this way should, between them, cover all the RPA regulatory duties and are sometimes referred to as a "Corporate RPA".
- 6.20 Frequently an individual appointed as an RPA may have a senior line management role in the organisation, and may also have separate regulatory duties (eg as Head of the Approved Dosimetry Service). Inspectors should seek to ensure that such individuals are clear about the scope and delineation of their duties, and are in a sufficiently authoritative position to offer independent advice to the Employer.

### **The Radiation Protection Supervisor**

- 6.21 The RPS should be appointed by the Radiation Employer for the purpose of securing compliance with IRR 99 in respect of work carried out in an area subject to Local Rules. Contractors who are radiation employers may appoint one of their own employees or other suitable person (eg an employee of the Licensee or of the Site Operator) as an RPS.
- 6.22 Some Licensees and site operators appoint staff at Team Leader level as an RPS, even though they may be based in an area some distance from the area subject to Local Rules. This may be acceptable so long as control is exercised, for example, through permit to work and other safety procedures.
- 6.23 Inspectors should consider interviewing one or more RPSs with a view to establishing that they are clear about their appointment, have received adequate training, know and understand the requirements of IRR 99 and the relevant Local Rules, and understand the precautions to be taken in an

emergency. RPSs should command sufficient authority from people working under their supervision.

- 6.24 In addition to the advice in the ACOP and Guidance, information on good practice is available in HSE Information Sheet Ionising Radiation Protection Series No. 6 which is available via the HSE website

### **Restriction of Exposure (Reg 8)**

- 6.25 The Radiation Employer has overall responsibility for restricting, so far as is reasonably practicable, the extent to which his employees and other persons are exposed to ionising radiation. Priority should be given to substitution and engineering control in preference to management control. Undue weight should not be placed on “time at risk” arguments, dose sharing or PPE.
- 6.26 Examples of good practice in this area are given in Appendix 3.
- 6.27 The Radiation Employer is required to carry out investigations where an employee receives an effective dose of 15 mSv/y (or any lower effective dose specified by the employer). Site inspectors should check that such investigations are carried out, but should consider referring these for specialist assessment.

### **Dose Limits (Reg 11) and Overexposures (Regs 25, 26)**

- 6.28 Dose Limits are set out in Schedule 4 Part 1. Any known or suspected overexposure should be investigated as required by Regulation 25. The Radiation Employer should notify the NII site inspector as soon as any such overexposure is suspected.
- 6.29 Where an employee has been subjected to an overexposure, site inspectors should check that the employer has introduced a reduced dose limit for the remainder of the calendar year.

### **Local Rules (Reg 17)**

- 6.30 The Radiation Employer is required to set down in writing Local Rules appropriate to the radiation risk and nature of operations. Inspectors should check that these exist and include key working instructions to restrict exposure during normal work and in the event of a radiation accident. These can take a variety of forms including instructions, booklets and circulars.
- 6.31 Essential content of the Local Rules are set out in Guidance (para 278). They should include the name of the relevant RPS and refer to the relevant Contingency Plan, which should cover a range of incidents including minor events (eg spills of radioactive liquid).
- 6.32 The Radiation Employer should normally have consulted the RPA (and possibly the relevant RPS) in drawing up Local Rules.

### **Control over Entry to Controlled Areas (Reg 18)**

- 6.33 Inspectors should check that Controlled (and Supervised) areas are suitably demarcated, with signs indicating the risks arising from any sources or contamination in the area. Licensees and site operators often use a colour-coded system, set out in safety rules, for such signage.

- 6.34 Access to controlled areas should be limited to classified persons and others who are permitted entry only under the terms of a written system of work. Such arrangements should be aimed at restricting exposure to ionising radiation by, for example, close supervision, the use of PPE, restrictions on the type of work done and restriction on the time spent in the area.
- 6.35 Examples of good practice in the design of a changeroom, and of barrier procedure signage, are given in Appendices 4 and 5. Acknowledgement: These drawings have been prepared by the Industry Radiological Protection Co-ordination Group in developing a Nuclear Industry Code of Practice for Changerooms (currently in draft form).

### **Monitoring of Designated Areas (Reg 19)**

- 6.36 Inspectors should ensure that all Employers (ie Contractors as well as the Licensee) have arrangements to ensure that levels of ionising radiation are adequately monitored and that working conditions are kept under review. Suitable monitoring equipment should be provided. This may include external dose rate monitors, airborne contamination monitors, dust samplers, beta/gamma contamination monitors and alpha contamination monitors. Such instruments should be regularly tested and records kept of test and monitoring results.
- 6.37 Inspectors should check that available data is regularly reviewed to confirm that an area designation remains appropriate. It is not sufficient to rely solely on dose uptake trends for this purpose.

### **Storage and Accountancy of Radioactive Substances (Reg 28,29)**

- 6.38 Inspectors may choose to consider the arrangements for storing and accounting for radioactive substances. In addition to the advice in the ACOP and Guidance, information on good practice is available in HSE Information Sheet Ionising Radiation Protection Series No. 8 which is available via the HSE website.
- 6.39 The definition of 'sealed sources' specifically excludes any radioactive substance inside a nuclear reactor or any nuclear fuel element.
- 6.40 Inspectors should check that arrangements are in place for accounting for the location of all radioactive substances at any one time. Most of the relevant radioactive substances at nuclear sites are likely to be solid sources for instrument calibration and checking, although some may be liquid solutions. Arrangements should be in place to account for these at least once per week, and preferably daily. When in use, they should be logged in and out of storage facilities.
- 6.41 Sources should be clearly labelled with a unique identifier. They should be stored in secure receptacles, which prevent dispersal and provide appropriate shielding. Surface dose rates should always be less than 2 mSv per hour (and in most cases should be much less than this).
- 6.42 Sources should be held in secure, weatherproof stores that offer a suitable level of fire-resistance and shielding. Stores should provide physical security and should normally be kept locked. They should be used only for the storage of radioactive substances and ancillary containers, shielding and equipment. The store entrance should bear a suitable warning sign indicating that it contains radioactive substances. Inspectors should ensure

that radiological surveys are routinely carried out within and surrounding the store to confirm appropriate area designation. Ventilation should be available to prevent airborne accumulations (sometimes including radon from the building materials) and may need to be operated for a period before entering the store.

- 6.43 In view of security issues, the Inspector should discuss arrangements for the accountancy and storage of radioactive materials in routine dealings with the OCNS site inspector, and should raise any perceived weakness in the security arrangements as a matter of urgency. Any correspondence relating to these arrangements should be copied to the OCNS site inspector.
- 6.44 Licensees and site operators should be encouraged to dispose of all unwanted sources as these can present unnecessary safety and security risks. However, it should be recognised that such disposals have been difficult to arrange in recent years.
- 6.45 A register should be maintained, on paper or computer, including the identifier of each source, its date of receipt, activity at a specified date, current location and, where appropriate, the date and manner of disposal and to whom it was sent. The arrangements should be audited regularly (preferably at least annually). Records should be kept for at least 2 years from the date of record entry or disposal.

#### **TOPICS RECOMMENDED FOR REFERRAL TO SPECIALIST ASSESSORS AT THE SITE INSPECTOR'S DISCRETION**

##### **The RPA**

- 6.46 RPAs should be aware of any limitations on the scope of their appointment, and hold a certificate from an assessing body (eg RPA 2000) or a relevant N/SVQ.
- 6.47 The RPA should be consulted by the Radiation Employer in respect of a number of matters including:
- Implementation of requirements for controlled and supervised areas (Reg 16)
  - Installation of new or modified sources of ionising radiation (Sched 5)
  - Regular calibration/checking of radiation monitoring equipment (Sched 5)
  - Periodic examination of systems to restrict radiation exposure (Sched 5)
  - Risk Assessment (as required by Reg 7)
  - Conduct of Investigations (various Regs)
  - Contingency Plans (Reg 12)
  - Dose Assessment and Recording (Reg 21)

##### **Prior Risk Assessment (Reg 7) and Contingency Plans (Reg 12)**

- 6.48 The Radiation Employer should carry out a risk assessment sufficient to show that all hazards with the potential to cause a radiation accident have been identified and the nature and magnitude of the associated risks have been evaluated. At nuclear licensed sites it is likely that such a risk assessment will identify reasonably foreseeable accident scenarios. These are likely to include, not only the major hazards for which emergency arrangements are in place under LC 11, but also minor hazards (eg those arising from radiography and the use of radioactive solutions that may be spilled in an active laboratory). The Radiation Employer should take steps to prevent such accidents, and (following consultation with the RPA) should have prepared a Contingency Plan that seeks to limit the consequences of any such accident.
- 6.49 A Contingency Plan should be rehearsed at suitable intervals. People affected by the Plan should be provided with suitable instructions and dosimetry. Some plans may be generic (eg where operations such as radiography are carried out at different locations at various times). Inspectors should ensure that such plans identify those responsible for taking action, immediate actions for assessing and mitigating the effects of any accident, the location of any PPE that might be needed, personal dosimetry requirements, sources of advice, the circumstances under which the emergency services should be called and provisions for dose assessment following the accident.

#### **Restriction of Exposure (Reg 8)**

- 6.50 A key requirement here is for the radiation employer to take all necessary steps to restrict, so far as is reasonably practicable, the extent to which his employees and others are exposed to ionising radiation. In other words, their exposure must be ALARP.
- 6.51 The application of relevant good practices and standards is part of the ALARP justification. Some elements of good practices are listed in Appendix 3
- 6.52 Radiation employers are required to utilise dose constraints in restricting exposure at the planning stage of radiological protection (eg in plant design) and to carry out investigations where an employee receives an effective dose of 15 mSv /y (or any lower effective dose specified by the employer). Site inspectors should consider referring such aspects for specialist assessment.
- 6.53 The requirement for restriction of exposure extends to all persons, including members of the public. Employers typically measure ambient dose rates at the site perimeter fence as part of their arrangements for demonstrating that effective doses received by members of the public do not exceed dose constraints. These arrangements at nuclear sites are assessed periodically by NSD specialists as part of a rolling programme.

## **Personal Protective Equipment (Regs 9, 10)**

6.54 PPE should bear the CE marking or should have been approved by HSE under the arrangements in place before 30 June 1995. Details are given in the guidance to the PPE at Work Regulations 1992 and in document HSG 53. Site inspectors should ensure that available PPE appears to be in good condition and fit for purpose, and is subject to regular examination and maintenance.

## **Control over Entry to Controlled Areas (Reg 18)**

6.55 Provision should be made for estimating the dose likely to be received by non-classified workers, but this need not involve issue of a personal dosimeter to them. For example, it may be acceptable for the host of a group of non-classified persons to wear a dosimeter to give an indication of the dose received by group members. Where classified persons are Outside Workers, then they should be subject to suitable training, instruction, dosimetry and PPE provided following co-operation between their Employer and the Radiation Employer (ie the Licensee).

## **Dose Assessment (Reg 21) and Approval of Dosimetry Services (ADS) (Reg 35)**

6.56 All employers (including Nuclear Site Licensees and their contractors) should make arrangements for the assessment and recording of radiation doses incurred by classified persons in their employ where such doses may be significant. Employers are required to co-operate in this respect and, in many cases, contractors use the dosimetry services appointed by the Nuclear Site Licensee. Employers should be an "intelligent customer" of such services.

6.57 HSE approves dosimetry services under the arrangements set out in Reg 35. Approved services are required to meet the published requirements. At sites regulated by NSD, such services are usually inspected by NII specialist radiological protection assessors and site inspectors would not normally be expected to spend their time further inspecting these services.

6.58 Inspectors should raise any query concerning the services provided by ADS with the relevant HSE specialist assessor.

6.59 More information on HSE's approval of dosimetry services is available in HSE Information Sheet Ionising Radiation Protection Series No. 2 which is available via the HSE website.

## **Notifications**

6.60 Site inspectors may wish to consider referring IRR 99-related notifications for specialist assessment where, for example:

- A request has been made for a special entry in an individual's dose record to remove a recorded dose in excess of a statutory dose limit [IRR99 Regulation 23(8)].
- There has been, or there was potential for, a dose to an individual above a statutory dose limit [IRR99 Regulation 25(1)].

- There has been, or there is likely to have been, a release of radioactivity or spill of radioactive material that was above or approaching the statutory reporting limits [IRR99 Reg 30(1)].
- There is reasonable cause to believe that radioactive material above the statutory reporting limit has been lost or stolen [IRR99 Reg 30(3)].
- (For sites having a medical department) the malfunction of radiation equipment used for medical diagnosis or treatment resulting in the exposure of a patient which was much greater than intended [IRR99 Regulation 32(6)].

## ARRANGEMENT OF IRR99

### PART I

#### Interpretation and General

1. Citation and commencement.
2. Interpretation.
3. Application.
4. Duties under the Regulations.

### PART II

#### General Principles and Procedures

5. Authorisation of specified practices.
6. Notification of specified work.
7. Prior risk assessment etc.
8. Restriction of exposure.
9. Personal protective equipment.
10. Maintenance and examination of engineering controls etc. and personal protective equipment.
11. Dose limitation.
12. Contingency plans.

### PART III

#### Arrangements for the Management of Radiation Protection

13. Radiation Protection Adviser.
14. Information, instruction and training.
15. Co-operation between employers.

### PART IV

#### Designated Areas

16. Designation of controlled or supervised areas.
17. Local rules and radiation protection supervisors.
18. Additional requirements for designated areas.
19. Monitoring of designated areas.

### PART V

#### Classification and monitoring of persons

20. Designation of classified persons.
21. Dose assessment and recording.
22. Estimated doses and special entries.
23. Dosimetry for accidents etc.
24. Medical surveillance.
25. Investigation and notification of overexposure.
26. Dose limitation for overexposed employees.

#### PART VI

##### Arrangements for the Control of Radioactive Substances, Articles and Equipment

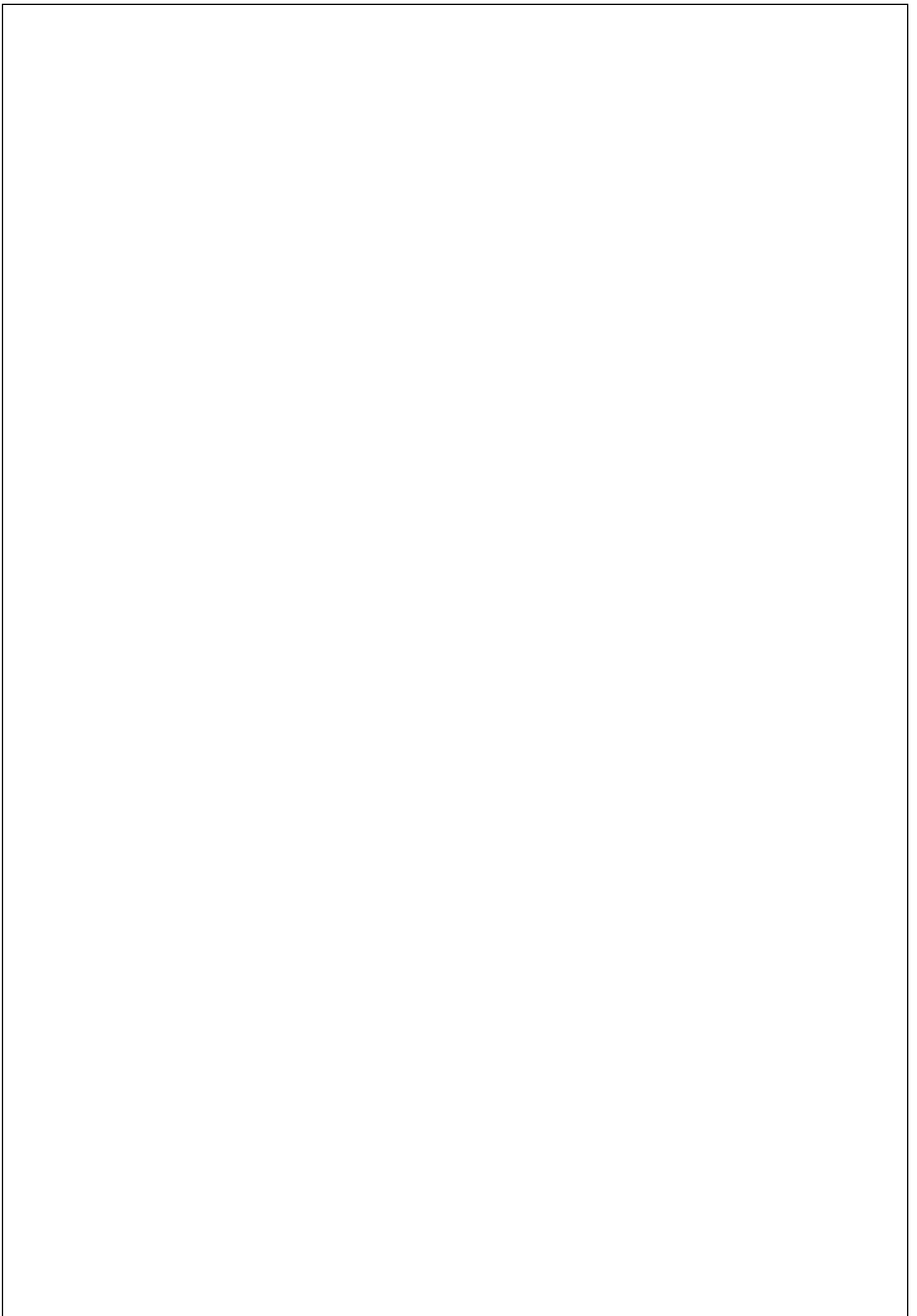
27. Sealed sources and articles containing or embodying radioactive substances.
28. Accounting for radioactive substances.
29. Keeping and moving of radioactive substances.
30. Notification of certain occurrences.
31. Duties of manufacturers etc. of articles for use in work with ionising radiation.
32. Equipment used for medical exposure.
33. Misuse of or interference with sources of ionising radiation.

#### PART VII

##### Duties of Employees and Miscellaneous

34. Duties of employees.
35. Approval of dosimetry services.
36. Defence on contravention.
37. Exemption certificates.
38. Extension outside Great Britain.
39. Transitional provisions.
40. Modifications relating to the Ministry of Defence.
41. Modification, revocation and saving.

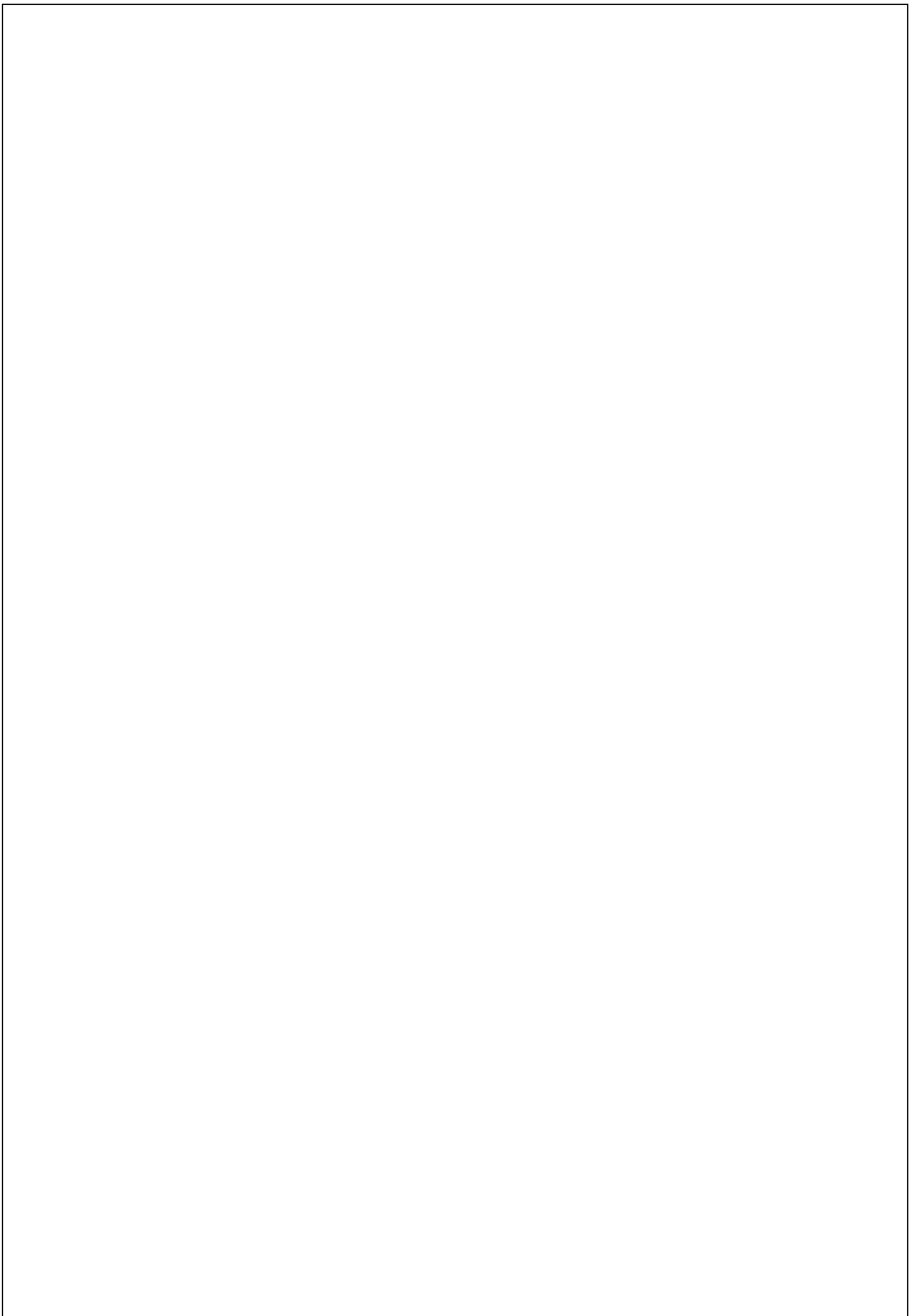
- Schedule 1. Work not required to be notified under regulation 6.
- Schedule 2. Particulars to be provided in a notification under Regulation 6(2).
- Schedule 3. Additional particulars that the Executive may require.
- Schedule 4. Dose limits.
- Schedule 5. Matters in respect of which a Radiation Protection Adviser must be consulted by a Radiation Employer.
- Schedule 6. Particulars to be entered in the radiation passbook.
- Schedule 7. Particulars to be contained in a health record.
- Schedule 8. Quantities and concentrations of radionuclides.
- Schedule 9. Modifications.



## HSE Guidance relevant to IRR 99

Ionising Radiation Information Sheets	Title
IRIS 1	Industrial radiography – managing radiation risks
IRIS 2	Radiation Doses – Assessment and Recording
IRIS 3	Portable nuclear moisture/density gauges in the construction industry
IRIS 4	Protection of Outside Workers against Ionising Radiation
IRIS 5	Authorisation under IRR 99
IRIS 6	Radiation Protection Supervisors
IRIS 7	Selection, Use and Maintenance of Portable Monitoring Instruments
IRIS 8	Control of Radioactive Substances
<b>Operational Circulars</b>	
OC 130/11	Enforcement Management Model (EMM): Application to Ionising Radiations
OC 560/52	The Radiation (Emergency Preparedness and Public Information) Regulations 2001
OC 560/53	The Ionising Radiations Regulations 1999

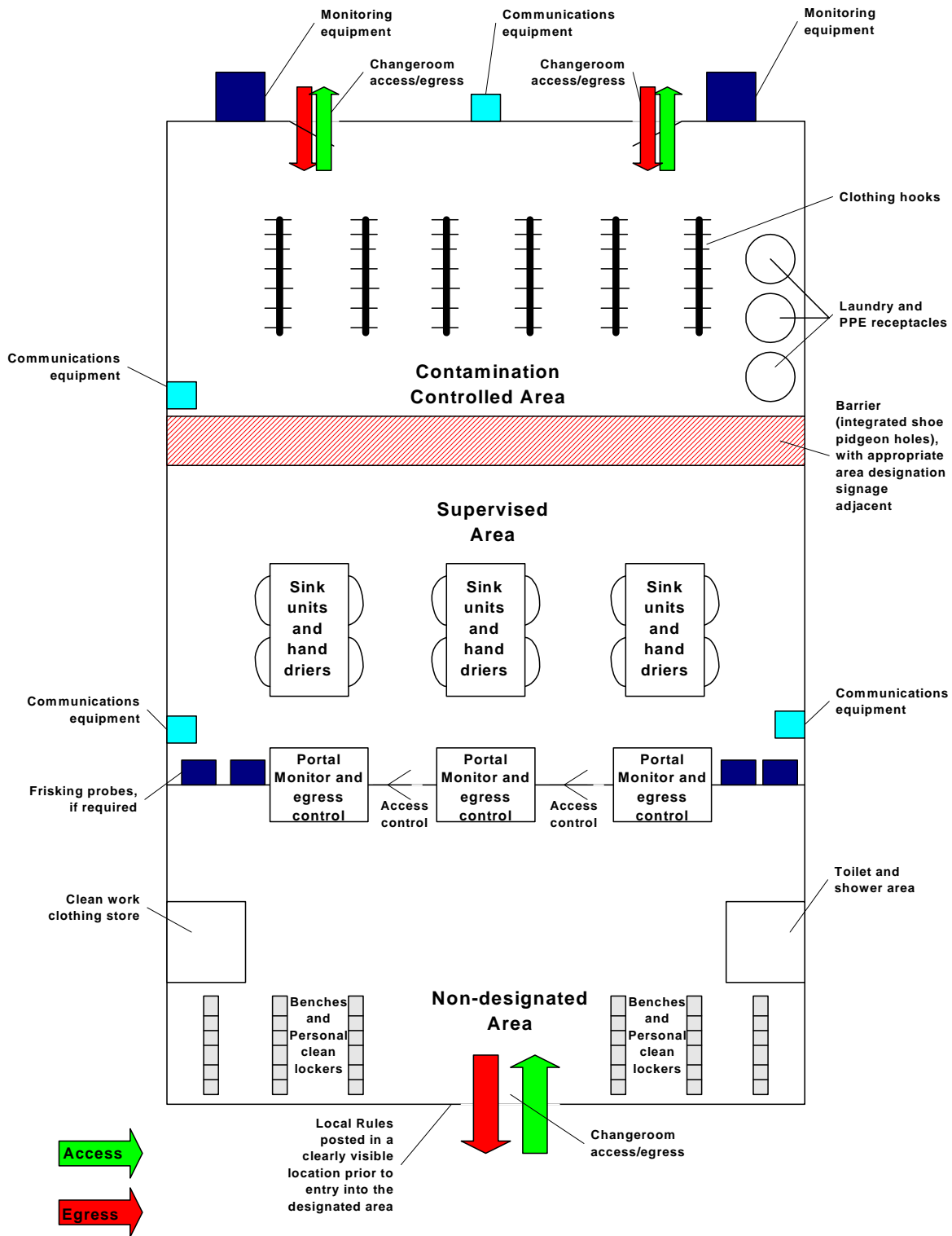
Note: Other Operational Circulars in the 560 – 564 series relate to specialist aspects.



**IRR 99 Reg 8 – Restriction of Exposure – Good Practices**

1. Licensees and site operators should be aware of and apply relevant good practices. Good practice is the generic term for those standards for controlling risk which have been judged and recognised by HSE as satisfying the law when applied to a particular relevant case in an appropriate manner. The main sources of written, recognised good practice include HSC Approved Codes of Practice (ACoPs), in particular the ACoP for IRR99, HSE Guidance, ICRP recommendations and guidance, British Standards and guidance produced by a relevant recognised body, as well as good practices used at other facilities and sites. There may also be unwritten, sources of well-defined and established standard practice adopted by the radiation protection community.
2. Work planning and scheduling programmes should be adopted which include the use of:
  - decision aiding techniques,
  - ALARP checklists to identify those factors that need to be considered before work is carried out,
  - checklists for pre-job and post-job briefings,
  - task feedback.
3. Estimates should be made of the likely occupational exposures prior to the commencement of work. Dose sharing as a primary means of managing exposures should be avoided.
4. Dose reduction working groups set up to identify improvements in plant operations that would reduce occupational doses. Such groups would involve members from the plant operations and management.
5. The adoption of a hierarchy of controls. The restriction of doses should be preferably by means of engineering controls and design features, then supporting systems of work and lastly personal protective equipment.
6. Training of staff at all levels about radiation doses and the importance of reducing occupational doses.
7. Training on tasks to be carried out e.g. the use of mock-ups in order to familiarise workers with potential problems and to improve their skills in carrying out the tasks. In this way, tasks can be carried out more efficiently in a radiation environment thus reducing occupational doses.
8. The setting of realistic dose targets for specific tasks or for work carried out during a specific period e.g. shift targets.
9. There should be reviews of the effectiveness of the ALARP measures (eg expected doses and actual doses may be compared during major projects whilst work is in progress).
10. There should be management commitment to these practices.

IRR 99 Reg 18 – Example of Good Practice in Change Room Design



Acknowledgement: This drawing has been prepared by the Industry Radiological Protection Co-ordination Group in developing a Nuclear Industry Code of Practice for Changerooms.

