

Radiation Protection & Design HSE Perspective

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The Ionising Radiations Regulations 1999

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Approved Code of Practice

Covers health and safety at work

Health & Safety Executive are the Regulators

<http://www.hse.gov.uk/pubns/books/l121.htm>

Responsibilities

Mainly **the employer** or “Radiation Employer”

Radiation Protection Adviser (RPA)

Advises employer on application of IRR99

Radiation Protection Supervisor (RPS)

supervises work in accordance with the Local Rules

Employees

Before starting work

Consult and appoint a Radiation Protection Adviser (RPA)

Build protection into design using constraints

Notify HSE of intention

Prior Authorisation

- Generic authorisations

Prior risk assessment

Designate areas

- Local rules
- RPS

Appropriate PPE and systems of work for restriction of exposure

Contingency plans

Instruct and train employees

Dose Limits (mSv per annum)

Limit	Employees \geq 18yr	Trainees < 18yr	Others
Effective Dose	20	6	1
Equivalent Dose (eye lens)	150	50	15
Equivalent Dose (skin) (ave. over 1cm ²)	500	150	50
Equivalent Dose (extremities)	500	150	50

Designated Areas - CONTROLLED

Necessary where:

- Special procedures necessary to restrict significant exposure
- Significant risk of spread of contamination
- Person likely to receive $E > 6\text{mSv}$ or $> 3/10$ of employee equivalent dose limit

Area physically demarcated or delineated

Signs to warn of designation, nature of hazard and risks

Control over entry

- Classified workers
- Systems of work to restrict exposure

Dose Monitoring

Washing facilities, contamination monitoring, no eating etc.

Classified Workers

Employee likely to receive $E > 6\text{mSv}$ or $> 3/10$ of employee equivalent dose limit

Certified fit by appointed doctor or EMA

Doses assessed and recorded by HSE Approved Dosimetry Services

Keep records until age 75 or for 50 years

Likely candidates in healthcare:

- Radiopharmacists (fingers)
- Cardiologists (eye, extremity)
- Interventional Radiologists (eye, extremity)

Local Rules

Written rules required for work in controlled and possibly supervised areas

Enable work to be carried out in accordance with IRR99

Appropriate to radiation risk

Identify key work instructions necessary to restrict exposure

Dose investigation level – not more than 15mSv

Contingency arrangements for foreseeable incidents

Responsibility of employer to provide

Responsibility of employee to read, understand and comply

Should be reviewed regularly

Restriction of Exposure

Design

Dose Constraints

Systems of Work

Personal Protective Equipment

Training

Pregnant Women

Design

Access restriction

Shielding

- Lead in walls and doors
- Lead glass screens
- Syringe shields

Equipment features

- Automation of manual actions

Room layout

Warning signs

Access to proper equipment

- Eg remote handling tools

Dose Constraints

A planning tool not a dose limit

Identify potential exposed groups

Set a dose constraint for each group

$\leq 0.3\text{mSv}$ per annum

Design facility so that this constraint will not be exceeded

Audit once running

Systems of Work

Procedural Controls come after design controls

Keeping doses ALARP and below 3/10 limits

Restrict:

- Amount of radiation
- Duration of exposure
- Number of people exposed

Permits to work if dose rates high enough

Personal Protective Equipment

If risk assessment determines it is necessary, employer should provide, employee should use

Adequate

- Ability of PPE to protect the wearer

Suitable

- Matched to the job and the person

RPA advises

QA



