

# Ionising radiation legislation: What it is and what it says

**Sejlo Gbenu**

[sejlo.gbenu@nhs.net](mailto:sejlo.gbenu@nhs.net)



# Outline

- Ionising radiation legislation
- Duties and responsibilities
- IRR17 specific requirements
- Questions

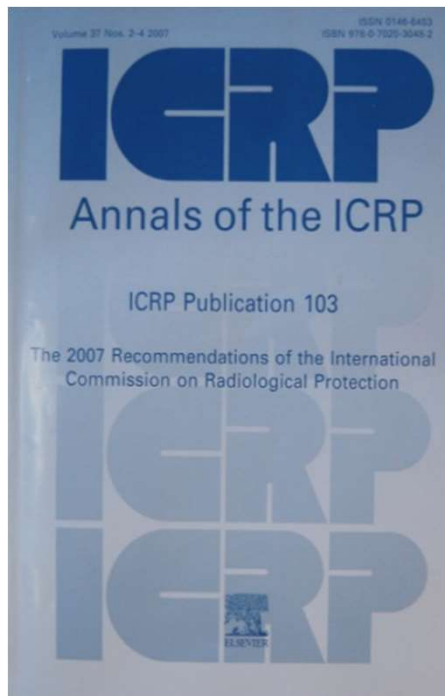


# Ionising radiation legislation



# Origin of RP legislation

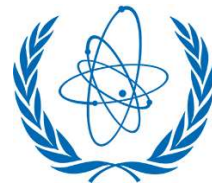
ICRP  
recommendations



Justification  
Optimisation  
Dose limitation



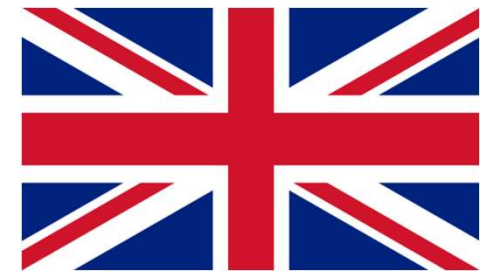
EU Directives



**IAEA**

International Atomic Energy Agency

UK Legislation



IRR17

IRMER17

2017 No. 1075

HEALTH AND SAFETY

The Ionising Radiations Regulations 2017

Made - - - - 27th November 2017

Laid before Parliament 30th November 2017

Coming into force - - 1st January 2018

CONTENTS

PART 1  
PRELIMINARY

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

PART 2  
GENERAL PRINCIPLES AND PROCEDURES

5. Notification of certain work
6. Registration of certain practices
7. Consent to carry out specified practices
8. Radiation risk assessments
9. Restriction of exposure
10. Personal protective equipment
11. Maintenance and examination of engineering controls etc and personal protective equipment
12. Dose limitation
13. Contingency plans

PART 3  
ARRANGEMENTS FOR THE MANAGEMENT OF RADIATION PROTECTION

14. Radiation protection adviser
15. Information, instruction and training
16. Co-operation between employers

PART 4  
DESIGNATED AREAS

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

PART 5  
CLASSIFICATION AND MONITORING OF PERSONS

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

PART 6  
ARRANGEMENTS FOR THE CONTROL OF RADIOACTIVE SUBSTANCES,  
ARTICLES AND EQUIPMENT

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

PART 7  
DUTIES OF EMPLOYEES AND MISCELLANEOUS

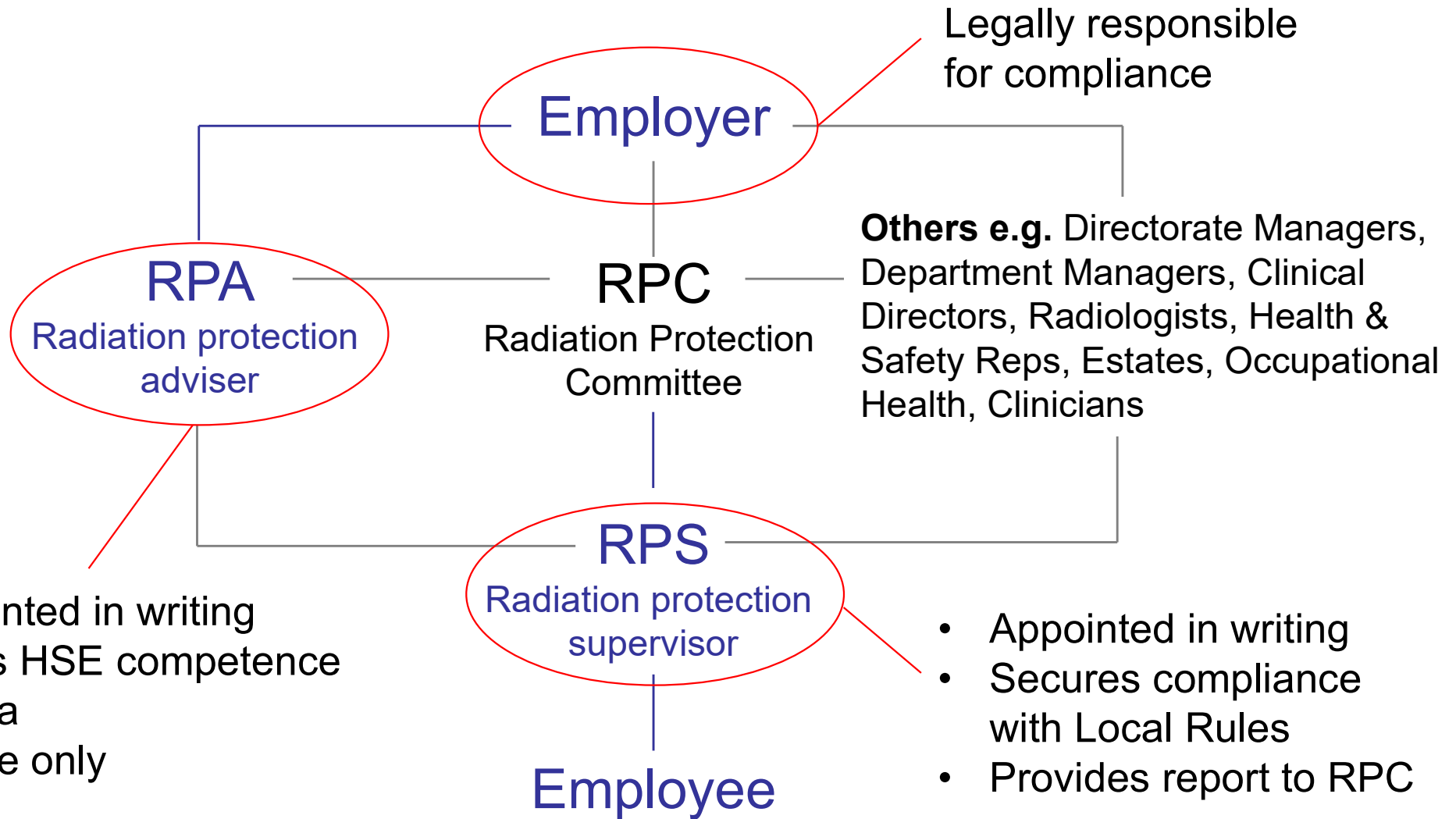
35. Duties of employees
36. Approval of dosimetry services
37. Defence on contravention
38. Exemption certificates
39. Extension outside Great Britain
40. Modifications relating to the Ministry of Defence etc
41. Transitional provisions and savings
42. Modifications and revocation
43. Review

- 
- SCHEDULE 1 — Work not required to be notified under regulation 5  
 SCHEDULE 2 — Consent to carry out a practice: indicative list of information  
 SCHEDULE 3 — Dose limits

# Duties and Responsibilities



# Typical RP management structure



# IRR17

## Specific requirements



# Scenario

Imagine that you have been tasked with identifying the necessary requirements to set up a new diagnostic facility that is currently not available within your Trust.

What will you consider?

What guidance are there in the regulations?

[L121 - Work with ionising radiation: Approved Code of Practice and guidance \(hse.gov.uk\)](#)



# Regulations 5, 6 & 7

## **Reg 5: Notification of certain work**

- work with radioactive materials within specific thresholds
- atmospheric radon concentration above 300Bq / m<sup>3</sup>

## **Reg 6: Registration of certain practices**

- Generators
- Radioactive materials above specific concentrations

## **Reg 7: consent to carry out specified practices**

- administration of radioactive substances to persons (or animals if resulting in human exposure)
- operation of accelerators
- practices involving High Activity Sealed Sources (HASS)
- radioactive environmental discharges



# Regulation 8

## Reg 8: Radiation Risk Assessment

Prior to commencing work the employer must

1. “*suitable and sufficient assessment*” of risk
2. Identify measures to restrict exposures
3. Identify all hazards with potential to cause accident
4. Evaluate nature and magnitude of risk from hazards

Where there is an accident risk, the employer must take all reasonably practicable steps to

1. prevent any such accident
2. limit the consequences
3. provide information, instruction and training and equipment to restrict their exposure



# Regulation 9

## Reg 9: Restriction of Exposure

Employers must ensure doses are kept ALARP

- Hierarchy of control measures:
  - Engineering controls and design features
  - Safety features and warning devices
  - Systems of work
  - PPE
- Dose constraints
- Investigation level
- Breastfeeding employees must not be engaged in any work with significant risk of intake of radionuclides or bodily contamination



# Regulations 10 & 11

## Reg 10: PPE

- PPE to comply with PPE Regulations 2002
- Employer must provide appropriate storage

## Reg 11: Maintenance & examination of engineering controls and PPE

The employer must ensure that engineering controls, design features, safety features, warning devices or PPE are

1. properly maintained,
2. tested thoroughly at suitable intervals.



# Your turn



What facility/modality did you choose?



What must be considered before work commences?



# Regulation 12 – Dose Limitation

	Whole body dose (mSv)	Skin, Extremities (mSv)	Lens of Eye (mSv)
Employees	20	500	20
Trainees (<18)	6	150	15
Public	1	50	15



# Regulation 14

## Regulation 14: Radiation Protection Adviser

Advise  
employer on  
observance of  
the Regulations

Meets HSE  
competence

Appointed in  
writing



## Regulation 15

### Reg 15: Information, Instruction & Training

The Employer must

1. Provide appropriate training in RP, to include
  - i. risks to health from ionising radiation
  - ii. General and specific procedures and precautions
  - iii. the importance of complying with the regulations
  - iv. Ensure those working in controlled areas and with HASS receive specific training
2. Provide adequate information for other persons “*concerned with the work*”
3. Ensure employees who may be pregnant or breastfeeding and are “*engaged in work*” with IR are
  - i. made aware risks to foetus and nursing infant
  - ii. importance of informing their employer asap



# Regulation 16

## **Reg 16: Cooperation between employers**

Where work of one employer may cause exposure to the employees of another employer, the employers are required to exchange information to ensure compliance with the Regulations



# Regulation 17

## Reg 17: Designation of Controlled and Supervised Areas

- Designation based on risk assessment
- Controlled Area if:
  - need special procedures to limit dose OR
  - any person may receive
    - $>6\text{mSv}$  effective dose OR
    - $>15\text{mSv}$  to the lens of the eye OR
    - $>150\text{ mSv}$  to the skin or extremities
- Supervised Area if:
  - necessary to keep area under review OR
  - any person may receive
    - $>1\text{mSv}$  effective dose OR
    - $>5\text{mSv}$  to the lens of the eye OR
    - $>50\text{ mSv}$  to the skin or extremities



# Regulation 18

## Reg 18: Local Rules and RPSs

### Local rules

- detail arrangements for restricting exposure with regard to radiation risk and nature of the work undertaken
- must be provided for Controlled Areas
- should be provided for supervised areas if necessary

Employers must ensure the contents of the Local Rules are brought to the attention of relevant employees (and others)

RPSs must be appointed in writing in areas with Local Rules. Their role is to secure compliance with the Regulations.



# Regulation 18...

**How many RPSs are required?**

**How to determine the number of RPSs required**

Consider

- the range and complexity of the work
- the number of different locations to be covered
- the type of shift work, absence due to sickness, training and holidays.



# Regulation 19

## Reg 19: Additional requirements for designated areas

1. Designated area must
  - i. be adequately described in the Local Rules
  - ii. have suitable and sufficient signage
  
2. Controlled area must be physically demarcated (or at least delineated). The employer must
  - i. Include specific conditions for entry (considering classification status, employee, outside worker...etc.)
  - ii. Keep documents to demonstrate environmental doses are restricted
  - iii. Make adequate arrangements to restrict the spread of radioactive contamination



# Questions

## True or False?

Local rules RPS only required  
RPSs can be appointed verbally  
where there is a controlled area or  
a supervised area.



# Regulation 21

## Reg 21: Designation of classified persons

Employees must be classified if they are likely to exceed

- 6mSv effective dose
- 15mSv to the lens of the eye
- 150mSv to the skin or extremities

Classified workers must be

- >18 years old
- certified fit to work with ionising radiation by relevant doctor
- Made subject to medical surveillance (Reg. 25)



# Regulation 22

## Reg 22: Dose assessment and recording

The employer must

1. make, and record, an assessment of all “*significant*” doses for classified employees
2. Make arrangement with approved dosimetry service to
  - i. Make systematic assessments of doses
  - ii. Maintain individual dose records
  - iii. Provide summaries of dose records
  - iv. Provide radiation passbook where appropriate



# Regulation 25

## Reg 25: Medical surveillance

Employees must be under adequate surveillance by a relevant doctor (appointed doctor or employment medical adviser) where

1. They are classified (or prospectively classified)
2. They are overexposed non-classified employees
3. a relevant doctor has made a certification

Health records must be maintained (for 30 years)



# Regulation 26

## **Reg 26: investigation and notification of overexposure**

- Overexposure means dose limit has been exceeded
- An investigation must be performed
- The person affected, appropriate authority, relevant doctor and other employers must be notified as soon as practicable
- Measures to prevent recurrence must be implemented
- Preliminary investigation reports must be kept for 2 years
- If over exposure confirmed, records of investigation must be kept for 30 years
- If overexposure confirmed, then dose record (if available) must be amended



# Regulation 32

## Reg 32: Duties of Manufacturers etc of articles for use in work with ionising radiation

- Manufacturer
  - must ensure equipment is designed and constructed to restrict dose to employees and other persons ALARP
- Installer
  - critical examination
  - consult with RPA about critical examination & results
  - provide adequate information on use, testing and maintenance



# Regulation 34 & 35:

**Reg 34: Misuse of or interference with sources of ionising radiation** (Applies to all persons)

## **Reg 35: Duties of employees**

1. Take reasonable care not to expose themselves or others to a greater extent than is necessary
2. Employees and outside workers provided with PPE must
  - i. Make full and proper use
  - ii. Report defects
  - iii. Store appropriately
3. Classified outside worker must not misuse passbook or falsify information
4. Must comply with employer regarding dose assessment
5. Present for medical examination (classified workers)
6. Report radiation incidents



## Regs not covered in this talk

- Reg 13: Contingency plans
- Reg 20: monitoring of designated areas (Covered in modality break-out sessions)
- Reg 23: estimated and notional doses and special entries
- Reg. 24: dosimetry for accidents
- Reg. 27: dose limitation for overexposed employees
- Reg. 28 – 31: covered in break-out sessions
- Reg. 36 approval of dosimetry services
- Reg. 37: defence on contravention
- Reg. 38: exemption certificates
- Reg. 39: extension outside Great Britain
- Reg. 40: modifications relating to the Ministry of Defence etc.
- Reg. 41: transitional provisions and savings
- Reg. 42: modifications and revocation
- Reg. 43: review



# Summary

## What is your role as a Radiation Protection Supervisor?

### **Below are some responsibilities of an RPS**

- Ensuring Compliance with Local Rules
- Ensure that Controlled and Supervised Areas are properly designated and maintained.
- Investigating and Reporting Incidents
- Work closely with the RPA to ensure compliance with regulations.
- Participate in safety audits and reviews of radiation protection procedures.



# Any Questions?

