Commission for the Protection
From Ionising and Non-Ionising Radiation

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Guidance on the designation of Radiation Protection Officers (RPOs) by undertaking

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1 Overview

The Radiation Protection Officer (RPO) is an integral component of an employer's radiation protection and safety arrangements and designated RPOs are key figures within the organizational safety structure.

The Commission for the Protection from Ionising and Non-Ionising Radiation (RPC) would like to provide some guidance on designation of the RPO by undertakings.

The main goal of this document is to establish guidance for building competence of RPOs and support undertaking in designation of RPO with sufficient technical competences in radiation protection.

2 Objective and Scope of this Guidance

The objective of this Guidance is to support the implementation of the Regulations 110-111 of the Basic Safety Standards for Ionising Radiation Regulations (SL585.01) by clarifying the role, tasks, and necessary education training and prior work experience of RPOs.

3 The legal requirements with regard to RPOs

SL585.01 defines the term radiation protection officer as:

> *"Radiation protection officer" means an individual designated by an undertaking, who is technically competent in radiation protection matters relevant for a given type of practice to supervise or perform the implementation of the radiation protection arrangements given in an undertaking's radiation protection programme".*

The duties of undertakings with respect to RPOs is stated in Regulation 110 of SL585.01 as being:

> *"(1) All undertakings and employers of outside workers shall designate a radiation protection officer.*
>
> *(2) Undertakings and employers of outside workers shall provide the radiation protection officers with the means necessary for them to carry out their tasks.*
>
> *(3) The radiation protection officer shall report directly to the undertaking/and employers of outside workers.*
>
> *(4) The undertaking is to ensure that the radiation protection officer has sufficient training."*

The role of RPOs as stated in Regulation 111 of SL585.01 is to:

> *"(1) Radiation protection officers are to assist the undertaking in the execution of its radiation protection programme.*
>
> *(2) The undertaking shall specify the specific roles of the radiation protection officer. The radiation protection officer may be assigned to perform aspects of the radiation protection programme or may have a supervisory role of some or all aspects of the programme.*
>
> *(3) The task of the radiation protection officer may be carried out by a radiation protection unit established within an undertaking or by a radiation protection expert."*

4 The relationship between the RPO and the Radiation Protection Programme

The requirements for a Radiation Protection Programme (RPP) are given in Regulation 100 of SL585.01 as:

> *"(1) Undertakings shall establish a radiation protection programme.*
>
> *The radiation protection programme may form part of the undertakings wider quality assurance programme.*
>
> *(2) The radiation protection programme shall be:*
>
> *(a) commensurate to the complexity and radiological safety and security risks;*
> *(b) take into account the prior safety assessment pursuant to regulation 101;*
> *(c) take into account all the relevant provisions of these regulations;*
> *(d) documented;*
> *(e) subject to periodic review by the undertaking;*
> *(f) made available as appropriate to employees of the undertaking and*
> *(g) made available at the request of the Secretariat.*
>
> *(3) The radiation protection programme shall indicate the assignment of responsibilities of safety within the undertaking. The undertaking shall be able to demonstrate leadership in radiation safety matters at the highest levels in an organization.*
>
> *(4) Undertakings shall record any report received from a worker that identifies any radiological safety concerns or and shall take appropriate action"*

As stated in the above Regulation 100(3) the undertaking needs to assign duties for safety within the organisation.

Pursuant to Regulation 111 of SL585.01 which states that the RPO's role is to assist with the undertaking and to implement the provisions indicated in the radiation protection program.

There needs to be no ambiguity in the roles assigned to the RPO and should be documented.

5 General Requirements of RPOs

Regulation 111 of SL585.01 states that the RPO's role is to assist with the undertaking and to implement the provisions indicated in the RPP.

The RPO should be an employee responsible for the facility or activity.

It is up to the undertaking to define the roles and responsibilities of the RPO(s).

In order for the RPO to perform their assigned tasks the undertaking should ensure that the RPO(s)

- Be familiar with:
    - The Maltese legal framework including SL585.01,
    - The practices involving radiation sources carry out by undertaking,
    - The organisational infrastructure of the undertaking, and
    - The RPP including the specific operating procedures (often referred to as local rules).
- Have sufficient power to be able to perform designated functions effectively.

6 Competence and Sustainability of RPO

To be competent in the role, the RPO should have a practical understanding of radiation protection principles, relevant regulatory requirements and operational arrangements.

The main area of competence for the RPO should include, but not be limited to the following:

- Basic safety standards for ionising radiation regulations SL585.01,
- Radiation protection and safety infrastructure,
- Radiation protection program documentation,
- Be aware of the importance of safety and security culture
- Radiological instrumentation and personal protective equipment,
- Radiological monitoring implementation,
- Occupation and emergency dose assessment,
- Documentation and records keeping,
- Radiation emergency preparedness and response,

The competence areas listed above are the minimum requirements for the RPO role, but additional specific training is typically needed in the workplace so that the RPO can implement optimal radiation protection according to the associated practice, resources and equipment available.

Larger facilities with multiple radiation applications it may be appropriate for the undertaking to designate several RPOs. For example, in a hospital with diagnostic radiology, radiotherapy and nuclear medicine departments, having specific RPOs for each department would be pragmatic, if resources allow.

The duties of an RPO vary depending on the nature of the undertaking's practice

7 Duties that maybe assigned to RPO

Below is a non-exhaustive list of duties that an undertaking may assign to RPO(s).

- Overseeing that work is carried out in accordance with radiation protection programme/local rules
- Assist in the development and review of the safety assessment and RPP documentation
- To liaise with RPE/MPE/management in line with the undertakings procedures
- Supervise or performing workplace monitoring
- Maintain radiation source records
- Maintain individual occupational dose records for all monitored staff and submit reports as appropriate
- Provide new workers with introduction to local rules and procedures
- Providing reports to undertaking/RPE
- Participating in emergency exposure response arrangements
- Provide information and training for exposed workers
- Assist in staff instruction and training activities
- Ensuring monitoring equipment is fit for use and calibrated
- Assist in compilation of medical doses to enable undertaking to produce facility DRLs
- Assist in accident Investigation and lessons learned
- Develop and implement a record keeping system to ensure that all personal radiation safety devices are checked and calibrated annually for faults or deficiencies.
- Attend approved courses and keep up to date with current advances in the field and learn about changes to legislative requirements as part of continuous professional development (CPD)
- Monitoring discharges to the environment from nuclear medicine facilities
- Assisting in decontamination activities in nuclear medicine facilities
- Investigation of abnormally high exposures and overexposures
- Implementation of the maintenance schedule of all safety related equipment
- Investigation of causes, consequences, remedial actions and accident prevention measures.

Assigned tasks should be clearly documented.

8 Work experience, personal abilities and skills of RPOs

The undertaking in appointing RPOs should ensure that the prospective RPO has sufficient work experience and personal abilities and skills to perform the duties that have been assigned

9 Education and Training for RPOs

In appointing RPO(s) the undertaking needs to consider the education and training, of the person to be appointed. In line with the graded approach to risk the undertaking needs to consider the risk and the complexity of work with ionising radiation. As a benchmark guide see the below table

	Minimum recommended Educational level	Training performed and to be repeated every 5 years (ref to Regulation 14 of SL585.01)
Radiotherapy	MQF 6 in radiography or Physics or medical doctor	2Hr Legal 8Hr Radiation Protection for all applications
Nuclear Medicine	MQF 6 in radiography or Physics or medical doctor	2Hr Legal 8Hr Radiation Protection for all applications
Interventional Radiology	MQF 5 in radiography or Physics or medical doctor	2Hr Legal 8Hr Radiation Protection for all applications
Diagnostic Radiology	MQF 5 in radiography or Physics or medical doctor	2Hr Legal 8Hr Radiation Protection for all applications
Dental Radiology	Dental surgeons or MQF 5 in in radiography or Physics	2Hr Legal 8Hr Radiation Protection for all applications
Industrial NDT	Industrial Radiography Level 2	2Hr Legal 8Hr Radiation Protection
Industrial production-line gauges/screening		2Hr Legal 2Hr Radiation Protection for low risk applications
Luggage screening		2Hr Legal 2Hr Radiation Protection for low risk applications
Veterinary Radiology	MQF5	2Hr Legal 8Hr Radiation Protection for all applications
Central storage facility	MQF 6/ Industrial Radiography Level 2	2Hr Legal 8Hr Radiation Protection for all applications
Transport operations		4hr Transport Class 7 drivers

The above table together with experience, ability and skills seeks to ensure that the RPO is competent enough to carry out the assigned tasks.

10 Suggested training syllabi

10.1 Suggested syllabus for the legal (2hrs)

Syllabus: Legal- Radiation Protection Officers
1. Purpose of regulation 2. Legal accountability 3. Prime responsibility 4. Promotion of safety culture within organization 5. Nuclear Safety and Radiation Protection Act 6. Commission for the Protection from Ionising and Non-Ionising Radiation 7. Basic Safety Standards Regulations. a) System of Radiation Protection (Part III) b) Education and Training (Part IV) c) Justification (Part V) d) Occupational Exposures (Part VI) e) Medical Exposures (Part VII) f) Public Exposures (Part VIII) g) Responsibilities and other Elements of regulatory control (Part IX) 8. Introduction to Waste Regulations 9. Introduction to Transport Regulations. 10. Interaction with the RPC 11. Notification 12. Inspections including inspection checklist 13. Radiation Protection Programme in detail 14. Organisation of radiation protection in an organisation 15. Role of RPE, MPE, RPO 16. Document management in a quality system 17. Worked examples a) Medical facility b) Production Line sensor 18. Multiple Choice assessment

10.2 Suggested syllabus for radiation protection low risk applications- (2hrs)

Syllabus: Radiation Protection for low risk applications
1. Basic Concepts a. Difference between ionising and non-ionising radiation b. Types of radiation: α, β, and γ c. Production of X-rays d. Penetration ability of radiation/ shielding materials e. Scattering of radiation f. Contamination 2. Beneficial uses of ionizing radiation in Malta 3. Background Radiation a. Explanation of different types of background radiation 4. Maltese legislation 5. General Principles of Radiation Protection a. Justification, b. Optimisation, c. Regulatory dose limits 6. Pregnancy a. Obligation to report pregnancy b. Dose limits 7. Principles of Protection from External Radiation explained using practical examples a. Time, b. Distance, c. Shielding 8. Radiation Protection Documentation a. Radiation protection programme b. Local Rules 9. Controlled Areas 10. Need to comply with employer's procedures 11. Monitoring for Radiation a. The workplace b. Personal 12. Worked examples: Luggage screening/ Production line sensor 13. Multiple Choice assessment

10.3 Suggested syllabus: Radiation Protection-for all applications (8hrs)

Syllabus: Radiation Protection for all applications

1. Basic Concepts
    a. Matter, molecules, elements, atoms, fundamental particles, atomic number, mass number, isotopes, radionuclides
    b. Types of radiation: α, β, and γ
    c. Radiation energies (eV)
    d. Production of X-rays
    e. Scattering of radiation
    f. Activity, decay, half-life
    g. Sealed and unsealed sources
    h. Contamination
    i. Ionisation
2. Beneficial uses of ionizing radiation in Malta
    a. Risks versus benefit of radiation
    b. Examples
3. Background Radiation
    a. Explanation of different types of background radiation
    b. Level in Europe
4. Introduction to Legislation (separate course for RPO's, RPE's and MPE's)
5. Euratom Treaty/Directives
6. IAEA Recommendations
7. Nuclear Safety and Radiation Protection Act
8. Radiation Protection Commission
9. Basic Safety Standards Regulations
10. Waste and Transport Regulations
11. Monitoring Equipment
    a. Types of monitors (direct, indirect reading) correct use
    b. Selection of correct monitor
    c. Testing and calibration
12. Radiation Units
    a. Activity (Bq)
    b. Absorbed dose (Gy)
    c. Equivalent dose and effective dose (Sv)
    d. Dose rate (µSv/hr)
    e. Conversion from old to SI units
    f. Commonly used prefixes
13. General Principles of Radiation Protection
    a. Justification,
    b. Optimisation
14. Regulatory Dose Limits
15. Safety Culture
    a. Definition

b. Examples

16. Specific Requirements of Regulations
    a. Licensing,
    b. Radiation Protection Program
    c. Roles:
        i) Undertaking
        ii) Worker
        iii) Radiation Protection Officer
        iv) Radiation Protection Expert
        v) Medical Physics Expert
17. Biological Effects
    a. Cell, nucleus,
    b. DNA, chromosomes,
    c. Cellular damage,
    d. Varying radiosensitivity,
    e. Stochastic and deterministic effects.
18. Principles of Protection from External Radiation
    a. Time,
    b. Distance,
    c. Shielding,
    d. Source outputs,
    e. Half value and tenth value thickness.
19. Contamination control
20. Personal dosimetry
21. Classification –
22. Medical surveillance, dose assessment,
23. ADS dose record keeping.
24. Types of dosemeter - film badges, TLDs, personal alarm monitors.
25. Workplace Monitoring
    a. Frequency of monitoring,
    b. Record keeping.
26. Emergency Procedures
27. Worked examples
    a. Medical facility
    b. Production Line sensor
28. Multiple Choice assessment

10.4 Suggested Syllabus: for Transport Class 7 Drivers (4 hrs)

Syllabus: Transport Class 7 Drivers
1. Basic Concepts a. Difference between ionising and non-ionising radiation b. Types of radiation: α, β, and γ c. Penetration ability of radiation/ shielding materials d. Contamination 2. Beneficial uses of ionizing radiation in Malta 3. Background Radiation a. Explanation of different types of background radiation 4. Maltese legislation 5. General Principles of Radiation Protection a. Justification, b. Optimisation, c. Regulatory dose limits 6. Pregnancy a. Obligation to report pregnancy 7. Principles of Protection from External Radiation explained using practical examples a. Time, b. Distance, c. Shielding 8. Class 7 package labelling 9. Transport documentation 10. Transport procedures

11 Maintaining Competence

An appointed RPO should always be competent in the role, that is, knowledge and skills should be kept up to date. This is best achieved through periodic refresher, or update, training on required knowledge and basic technical skills.

An undertaking or, in case of outside workers, the employer of the outside worker should ensure that RPO:

- Have received appropriate radiation protection training before commencing work.
- That the radiation protection training is repeated and not exceed a period of 5 years.
- Keep records of training and re-training performed, including the training certificates.

Revision History

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