

IAEA competence framework and learning paths for QERP and RPO

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Overview

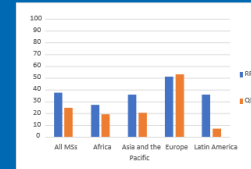
1. Introduction to IAEA Safety Standards



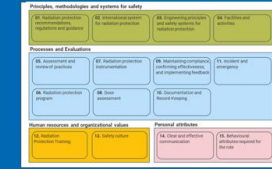
2. Definitions, roles and duties of QE and RPO



3. Implementation of QE and RPO requirements



4. Competence framework for QE and RPO



4. Learning paths for building competence of QE and RPO



5. Way forward



1. Introduction to IAEA Safety Standards



Safety Standards

- To **establish standards of safety** for protection of health and minimization of danger to life and property (including such standards for labour conditions), and ...
- ...to **provide for the application** of these standards

ARTICLE III Functions, A.6

STATUTE



Safety Standards

The Safety Standards consists of three sets of publications:

- **Safety Fundamentals**, establish the fundamental safety objective and principles of protection and safety;
- **Safety Requirements** set out the requirements that must be met to ensure the protection of people and the environment
- **Safety Guides** provide recommendations and guidance on how to comply with the requirements.

The Hierarchy of the IAEA Safety Standards



Status of IAEA Safety Standards

- IAEA Safety Standards **are not legally binding** on Member States (may be adopted by them, at their own discretion)

however...

- IAEA Safety Standards **are binding on IAEA in relation to its own operations** and to operations assisted by the IAEA; and
- **Member States receiving IAEA assistance** are obliged to apply IAEA Safety Standards



2. Definitions, roles and duties of QE and RPO



Definitions and roles

Qualified Expert

- “an individual who, by virtue of certification by appropriate boards or societies, professional licence or academic qualifications and experience, is duly **recognized as having expertise** in a relevant field of specialization, e.g. medical physics, **radiation protection**, occupational health, or any relevant ..safety specialty”
- “qualified experts are identified and **consulted** as necessary on the proper observance of these Standards”

Definitions

Requirements 4: 2.46

IAEA Safety Standards

for protecting people and the environment

Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

Jointly sponsored by

EC, FAO, IAEA, ILO, OECD/NEA, PAHO, UNEP, WHO



General Safety Requirements Part 3 No. GSR Part 3



Definitions and roles

Radiation Protection Officer

- “a person technically competent in radiation protection matters relevant for a given type of **practice** who is designated by the registrant, licensee or employer to **oversee** the application of regulatory requirements ”

Definitions

IAEA Safety Standards

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General Safety Requirements Part 3 No. GSR Part 3



Establishment of Requirements

The government shall ensure that requirements are established for:

- **education, training, qualification** and **competence** in protection and safety of all persons engaged in activities relevant to protection and safety
- the **formal recognition** of **qualified experts**

Regulatory body establishes **criteria** for the designation of the **radiation protection officer**

Requirement 2: 2.21(a, b)

Requirement 24: 3.94(e)

IAEA Safety Standards

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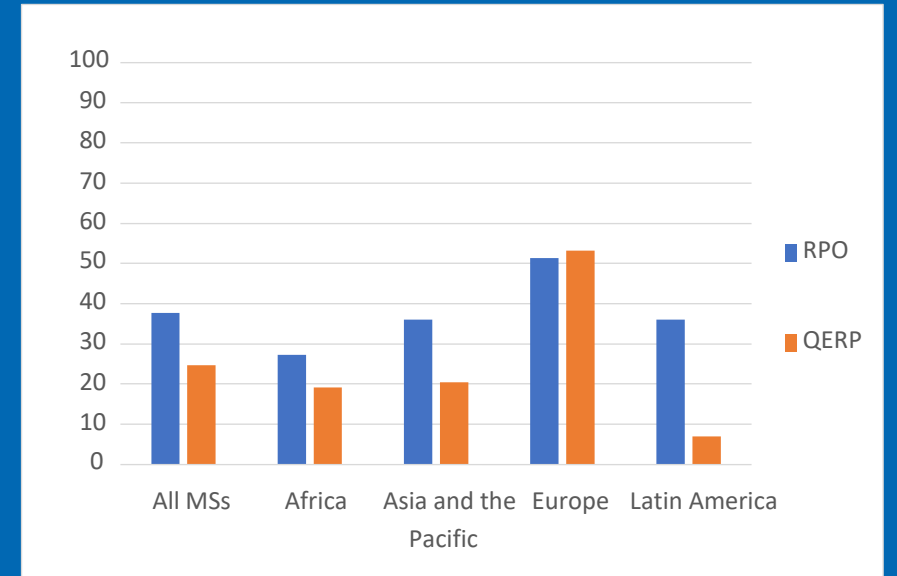
EC, FAO, IAEA, ILO, OECD/NEA, PAHO, UNEP, WHO



General Safety Requirements Part 3 No. GSR Part 3

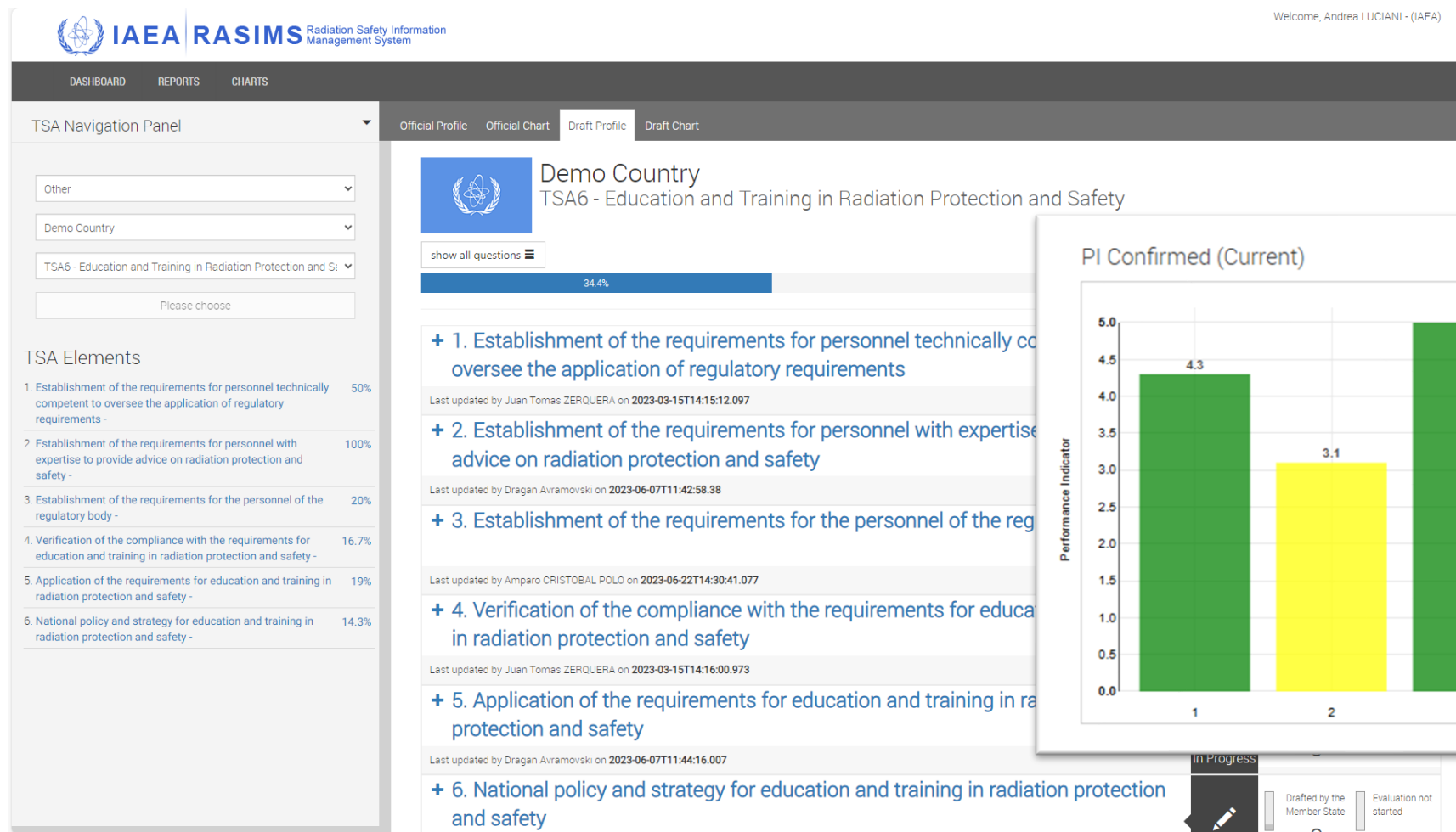


3. Implementation of QE and RPO requirements



Implementation of Requirements in MSs

Radiation Safety Information Management System



Implementation of Requirements in MSs

RASIMS: QE and RPO

Alignment of MSs requirements on

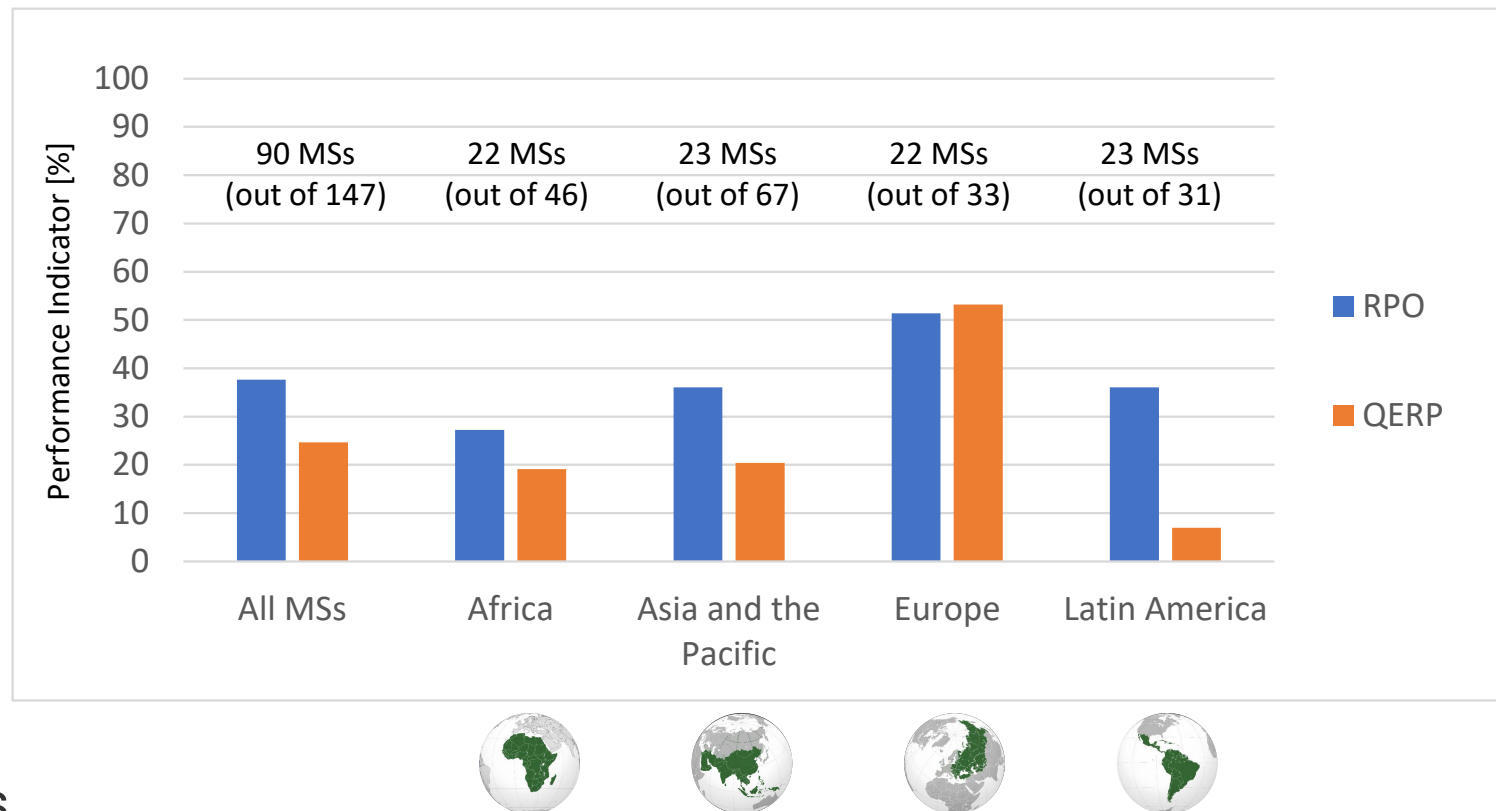
- Education
- Training
- Competence
- Qualification
- Formal recognition (QERP)
- Designation (RPO)



with relevant IAEA Safety Standards



IAEA RASIMS Radiation Safety Information Management System



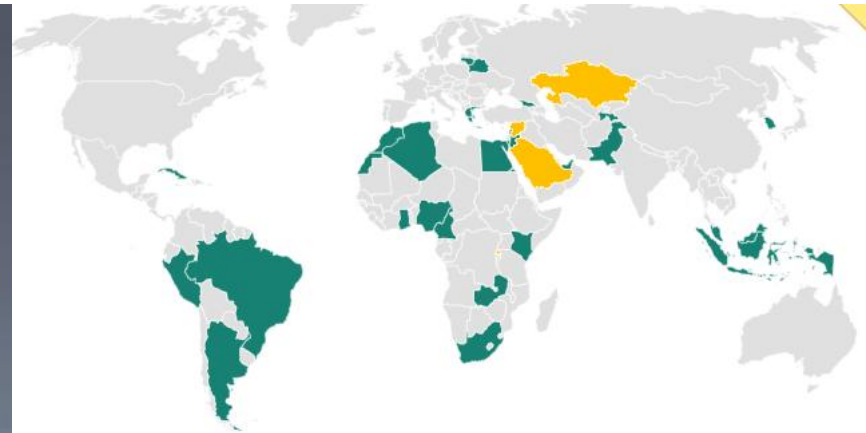
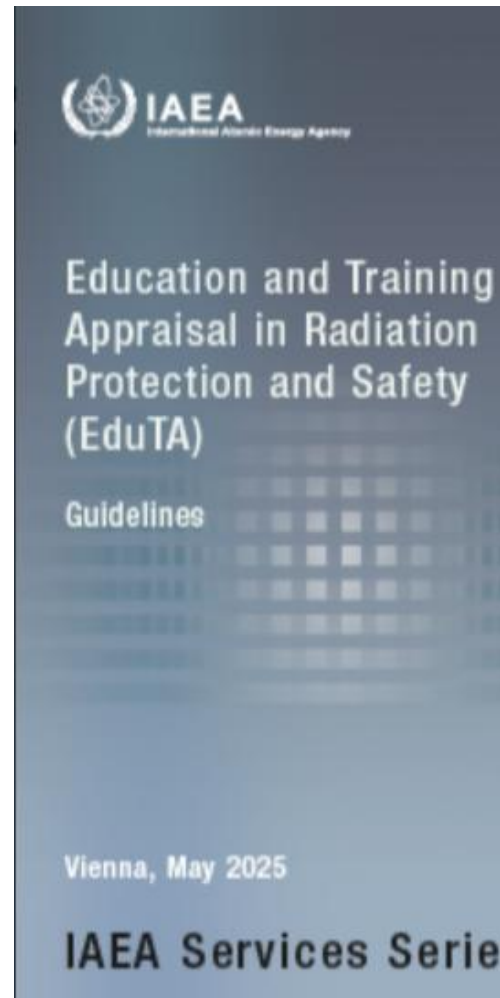
Implementation of Requirements in MSs

EduTA

Alignment of MSs requirements
with relevant **IAEA Safety Standards**
(as RASIMS)



**E&T programmes to build
competence**
(learning path)



8.4 MODULE B: IMPLEMENTATION OF THE LEGAL AND REGULATORY FRAMEWORK FOR E

- ▶ B.1 Analysis of education and training needs
- ▶ B.2 Design of the national education and training programme
 - B.2.1 Qualified Expert in Radiation Protection
 - B.2.2 Radiation Protection Officer
 - ▶ B.2.3 Health Professionals
 - B.2.4 Other personnel
 - B.2.5 Regulatory Staff
- ▶ B.3 Development and implementation of the national education and training programme
 - B.3.1 Qualified Expert in Radiation Protection
 - B.3.2 Radiation Protection Officer
 - ▶ B.3.3 Health Professionals
 - B.3.4 Other personnel
 - B.3.5 Regulatory Staff
- ▶ B.4 Evaluation of a national education and training programme

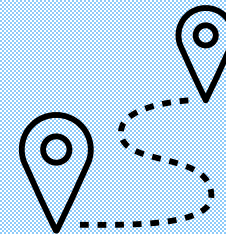
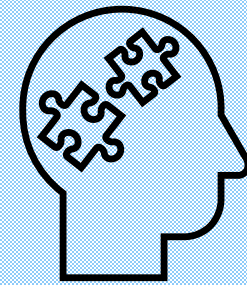
Implementation of QE and RPO role in IAEA MSs

IAEA Safety Standards 'outline' the **role** and **duties** of QERP and RPO, but

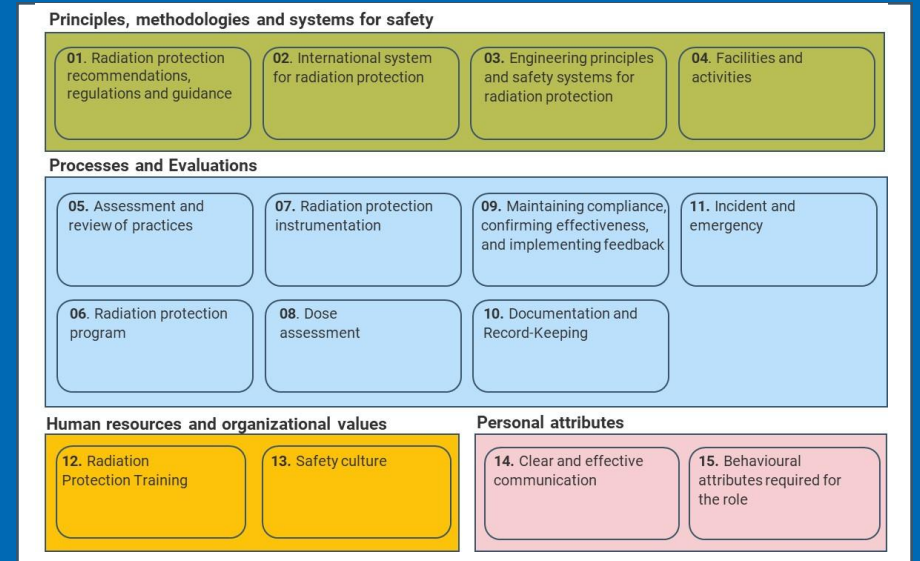
- MSs do still have **challenges in properly including these roles** in the national legislation and regulations

IAEA Safety Standards do not describe:

- the **competences** needed by QERP and RPO to carry out their respective assigned duties, and
- the **learning path** (e.g., education , training) to achieve such competences

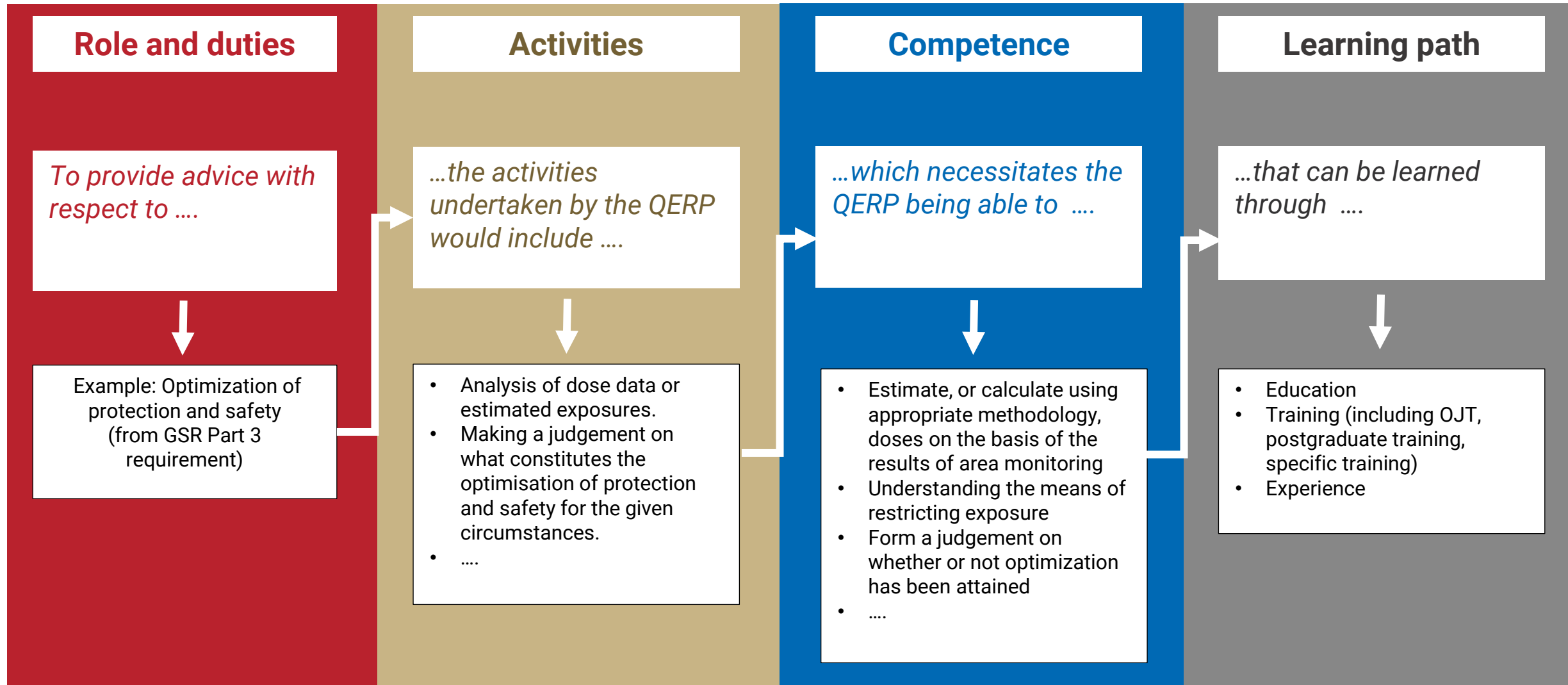


4. Competence framework for QE and RPO



Identification of Competences

Methodology



Competence areas

Principles, methodologies and systems for safety

01. Radiation protection recommendations, regulations and guidance

02. International system for radiation protection

03. Engineering principles and safety systems for radiation protection

04. Facilities and activities

Processes and Evaluations

05. Assessment and review of practices

07. Radiation protection instrumentation

09. Maintaining compliance, confirming effectiveness, and implementing feedback

11. Incident and emergency

06. Radiation protection program

08. Dose assessment

10. Documentation and Record-Keeping

Human resources and organizational values

12. Radiation Protection Training

13. Safety culture

Personal attributes

14. Clear and effective communication

15. Behavioural attributes required for the role

Competence: KSA

Principles, methodologies and systems for safety

01. Radiation protection recommendations, regulations and guidance

QERP

Competence			
Description	KSA	LoC	
Application of the national framework for radiation protection: Analyzes and interprets national legal and regulatory provisions, technical standards, and guidance on radiation protection, and provides authoritative advice on their application to ensure that regulatory compliance of facilities and activities is achieved and maintained.	Understanding of:		
	K. Legal and regulatory provisions, technical standards, and guidance on radiation protection.	H	
	K. International technical references and standards (e.g. ISO standards) pertaining to radiation protection and relevant to the national framework for radiation protection	M	
	Ability to:		
	S. Identify the relevant requirements for the various categories of exposure (occupational exposure, public exposure and medical exposure) and evaluate whether and how they apply for planned exposure situations.	H	
	S. Identify the relevant requirements for the occupational and public exposure, and evaluate how and whether they apply to emergency and existing exposure situations.	H	
	S.		
	Willingness to:		
	A. Engage with regulatory bodies, international organizations, and other interested parties to stay informed and ensure alignment with best practices in radiation protection.	H	
	A. Engage consistently in lifelong learning and continuous building competence activities to keep abreast of changes and updates in radiation protection regulations, national and international standards, and the latest research and advancements in international technical references among professionals in the field.	H	

Competence: KSA

Principles, methodologies and systems for safety

01. Radiation protection recommendations, regulations and guidance

RPO

Competence			
Description	KSA	LoC	
Implementation of the national framework for radiation protection: Implements the national legal and regulatory provisions, technical standards, and guidance on radiation protection, through monitoring, recording and reporting, to ensure regulatory compliance of practices in line with the advice of the qualified expert.	Understanding of:		
	K. Legal and regulatory provisions, technical standards, and guidance on radiation protection, relevant to the practice in the organization.	M	
	K. International technical references and standards (e.g. ISO standards) pertaining to radiation protection and relevant to the practice in the organization.	L	
	Ability to:		
	S. Oversee the application of the relevant legal and regulatory provisions for the practice in the organization.	M	
	Willingness to:		
	A. Engage with the qualified expert, the employers, registrants and licences, the workers, and the regulatory body to provide information, to collect feedback, and to contribute to improvements to align with best practices in radiation protection.	M	

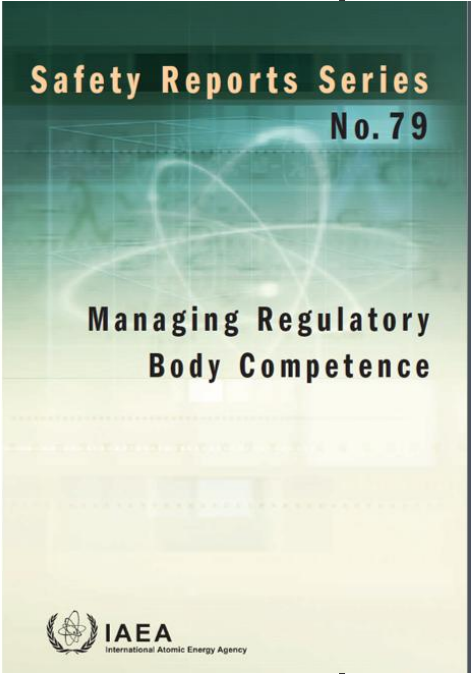
Competence: KSA

Principles, methodologies and systems for safety

01. Radiation protection recommendations, regulations and guidance

QERP

Competence		
Description	KSA	LoC
Application of the national framework for radiation protection: Analyzes and interprets national legal and regulatory provisions, technical standards, and guidance on radiation protection, and provides authoritative advice on their application to ensure that regulatory compliance of facilities and activities is achieved and maintained.	Competence: definition • "Knowledge" is familiarity with something and can include facts, descriptions and information acquired through experience or education. It can refer to both the theoretical and the practical understanding of a subject • "Skill" is the learned capacity to perform a task to a specified standard • "Attitude" is the feelings, opinions, ways of thinking, perceptions, values, behaviour and interests of an individual which allow a job or task to be undertaken to the best ability of that individual. Attitudes cannot wholly be taught directly and are partly a consequence of the organizational culture	



Competence: KSA

Principles, methodologies and systems for safety

01. Radiation protection recommendations, regulations and guidance

QERP

Competence			
Description	KSA	LoC	
Application of the national framework for radiation protection: Analyzes and interprets national legal and regulatory provisions, technical standards, and guidance on radiation protection, and provides authoritative advice on their application to ensure that regulatory compliance of facilities and activities is achieved and maintained.	Understanding of:		
	K. Legal and regulatory provisions, technical standards, and guidance on radiation protection.	H	
	K. International technical references and standards (e.g. ISO standards) pertaining to radiation protection and relevant to the national framework for radiation protection	M	
	Ability to:		
	S. Identify the relevant requirements for the various categories of exposure (occupational exposure, public exposure and medical exposure) and evaluate whether and how they apply for planned exposure situations.	H	
	S. Identify the relevant requirements for the occupational and public exposure, and evaluate how and whether they apply to emergency and existing exposure situations.	H	
	S.		
	Willingness to:		
	A. Engage with regulatory bodies, international organizations, and other interested parties to stay informed and ensure alignment with best practices in radiation protection.	H	
	A. Engage consistently in lifelong learning and continuous building competence activities to keep abreast of changes and updates in radiation protection regulations, national and international standards, and the latest research and advancements in international technical references among professionals in the field.	H	

High
Medium
Low

Level	Knowledge	Skills	Attitude
High (H)	Demonstrates comprehensive, critical, and integrated understanding of relevant principles, requirements, methods, and technical foundations. Able to interpret complex situations, evaluate options, and adapt or generate solutions, including in unfamiliar contexts. Integrates knowledge across domains and critically assesses approaches and outcomes.	Performs complex tasks autonomously, reliably, and efficiently in both routine and non-routine situations . Exercises sound judgment, solves problems, and adapts to evolving conditions. Provides guidance to others, supports decision-making , and contributes to improving processes and practices.	Fully internalizes professional and organizational values and consistently reflects them in behaviour. Acts proactively , demonstrates integrity and accountability, and promotes a strong safety culture. Leads by influence, fosters collaboration , and supports continuous improvement and learning.
Medium (M)	Demonstrates sound and functional understanding of relevant principles, requirements, and methods. Understands both what is to be done and why, and applies knowledge effectively in routine and predictable situations . Can interpret requirements and recognize when situations fall outside normal conditions.	Performs tasks independently in normal working conditions and to the required standard . Implements procedures, interprets routine situations, and identifies deviations or emerging issues. Takes appropriate action within the scope of responsibility and seeks support when needed .	Demonstrates consistent commitment to expected values and behaviours. Shows accountability, vigilance , and cooperation. Engages proactively within the scope of the role , supports teamwork, and contributes to maintaining and strengthening safety culture.
Low (L)	Demonstrates basic awareness and understanding of essential concepts, terminology, and requirements relevant to the role. Knowledge is mainly introductory and may require guidance for correct application.	Performs simple and well-defined tasks following instructions , procedures, or guidance. Supports more complex tasks but typically requires supervision or direction .	Demonstrates awareness of expected behaviours and willingness to comply with rules and instructions. Engagement is mainly supportive and reactive , with limited autonomy. Shows readiness to learn and develop competence.

Competence areas

Principles, methodologies and systems for safety

01. Radiation protection recommendations, regulations and guidance

RPO

Competence			
Description	KSA	LoC	
Implementation of the national framework for radiation protection: Implements the national legal and regulatory provisions, technical standards, and guidance on radiation protection, through monitoring, recording and reporting, to ensure regulatory compliance of practices in line with the advice of the qualified expert.	Understanding of:		
	K. Legal and regulatory provisions, technical standards, and guidance on radiation protection, relevant to the practice in the organization.	M	
	K. International technical references and standards (e.g. ISO standards) pertaining to radiation protection and relevant to the practice in the organization.	L	
	Ability to:		
	S. Oversee the application of the relevant legal and regulatory provisions for the practice in the organization.	M	
	Willingness to:		
	A. Engage with the qualified expert, the employers, registrants and licences, the workers, and the regulatory body to provide information, to collect feedback, and to contribute to improvements to align with best practices in radiation protection.	M	

4. Learning paths for building competence of QE and RPO



Learning paths

Three main mechanisms to build competence:

- Education

- Training

- Experience

- **Primary education (ISCED 1)** provides foundational literacy, numeracy, and core learning skills, typically beginning between ages 5 and 7 and lasting about 4–7 years;
- **Secondary education (ISCED 2–3)** builds on primary education, offering intermediate-level learning and preparation for the labour market or further education, usually concluding around ages 17–18;
- **Post-secondary non-tertiary education (ISCED 4)** extends secondary education with additional training to support labour market entry or progression to tertiary education;
- **Tertiary education (ISCED 5–8)** delivers advanced, specialized academic and professional education, focusing on high levels of complexity and expertise.



Learning paths

Three main mechanisms to build competence:

- Education

- Training

- Training carried out in the work environment (OJT)
- Training carried out within a training organization

- Experience



Learning paths

Three main mechanisms to build competence:

- Education

- Training

- Experience

- Experience gained directly in the same role, while performing the duties of a position
- Experience in a related fields while working in a different role
(e.g., an individual with experience in junior roles sufficient to support the progression into a senior position, even if they have not previously held such a role)



QERP

Recognition

Documentary evidence on:

Education
(minimum level: bachelor's degree (ISCED level 6))

Training

- Postgraduate training
- On-the-Job training

Experience
(in a related field while working in a different role)

+

Examination
(including oral interview)

Re-recognition

Documentary evidence on:

Experience
(practicing in the same role and field)

Other CPD activities
(dedicated training, workshops, etc)

RPO

Designation

Documentary evidence on:

Education
(minimum level: upper secondary (ISCED level 3))

Training

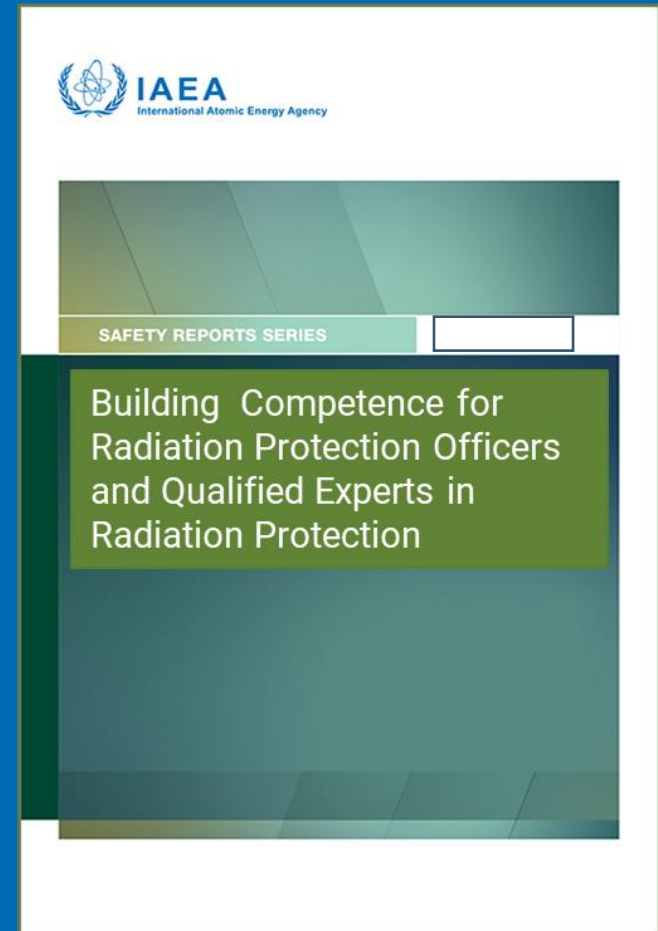
Experience
(in a related field while working in a different role)

Maintaining competence

Documentary evidence on:

Refresher training

5. Way forward



Way forward

Feedback from Member States

Morocco
14-18 October 2024



[country]
dd-MM- 2026

Austria
16-20 December 2024



Colombia
19-22 December 2025



Way forward

Feedback from co-sponsoring / endorsing organizations

Sharing the draft publication to the ILO, IRPA and EUTERP over the course of 2026:

- Presenting the main approaches used in developing the current draft of the publication
- Collecting and collating feedback and comments
- Developing an updated version of the draft publication



International
Labour
Organization



INTERNATIONAL
RADIATION PROTECTION
ASSOCIATION



Way forward

Objective by end of 2026

- Presentation of the revised draft to the IAEA Steering Committee on education and training in radiation, transport and waste safety

Objective by mid of 2027

- Submission of the manuscript for publication in the IAEA Safety Report Series

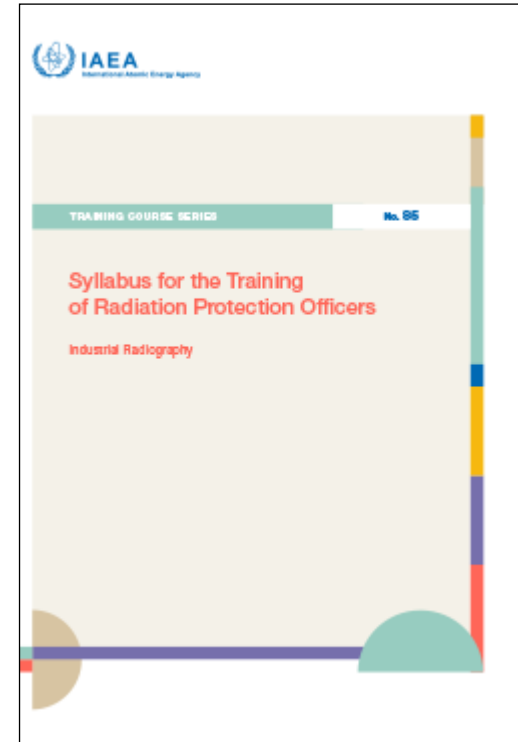


Way forward

RPO training syllabi

We are planning to publish a collection of syllabi, with each one focussing on a given type of practice:

- Industrial radiography : [TCS-85](#)
- Diagnostic radiology and image-guided interventional procedures : [IAEA-TCS-90](#)
- Nuclear medicine
- Cyclotrons
- Gauges
- Irradiators
- NORM
- Radiotherapy
- Radiotracers





Thank you!

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