



Education and Training in Radiation Protection: Role and Reflections of Competent Authorities

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Competence-based approaches in radiation protection
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Why competence matters?

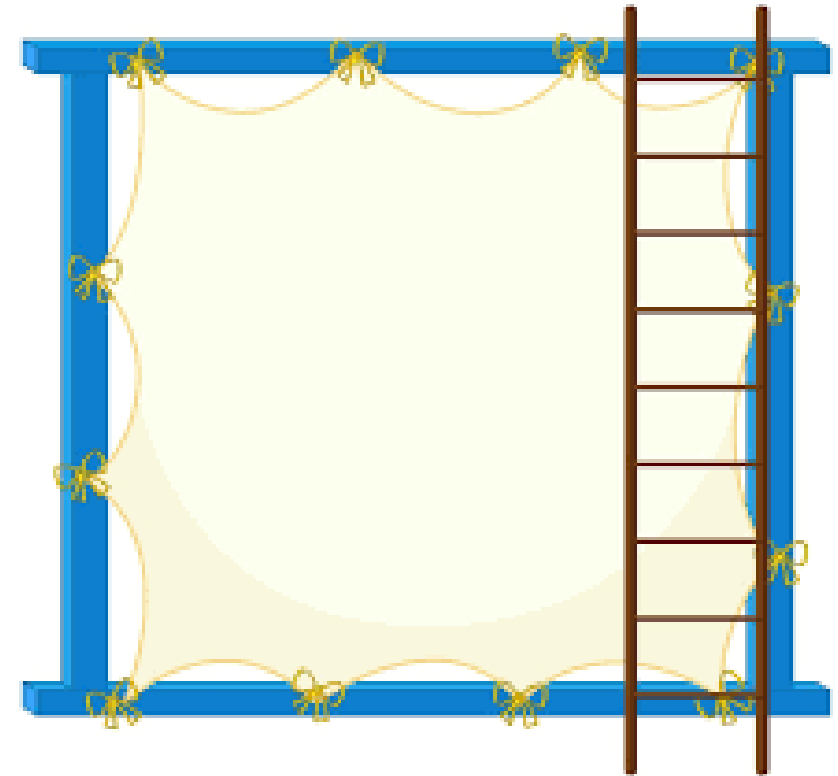
- Compliance with the regulatory requirements alone does not guarantee radiation protection.
- Effective radiation protection strongly relies on **Knowledge, Skills, Attitudes**, Experience and Professional judgement of the persons involved in radiation practices.
- Training alone is not enough...



European and International framework

- Council Directive 2013/59/Euratom
- IAEA, GSR Part 3
- ENETRAP III. European Guidance on the Implementation of the Requirements of the Euratom BSS with respect to the RPE and the RPO.
- HERCA WGE&T. HERCA Guidance, Implementation of RPE and RPO Requirements of Council Directive 2013/59/Euratom.
- HERCA. Analysis of Country Fact Sheets (CFS) on the implementation of RPE and RPO concepts in EU MS.

Key principle: Competence requirements should be commensurate with the nature, complexity and risk of the practice.



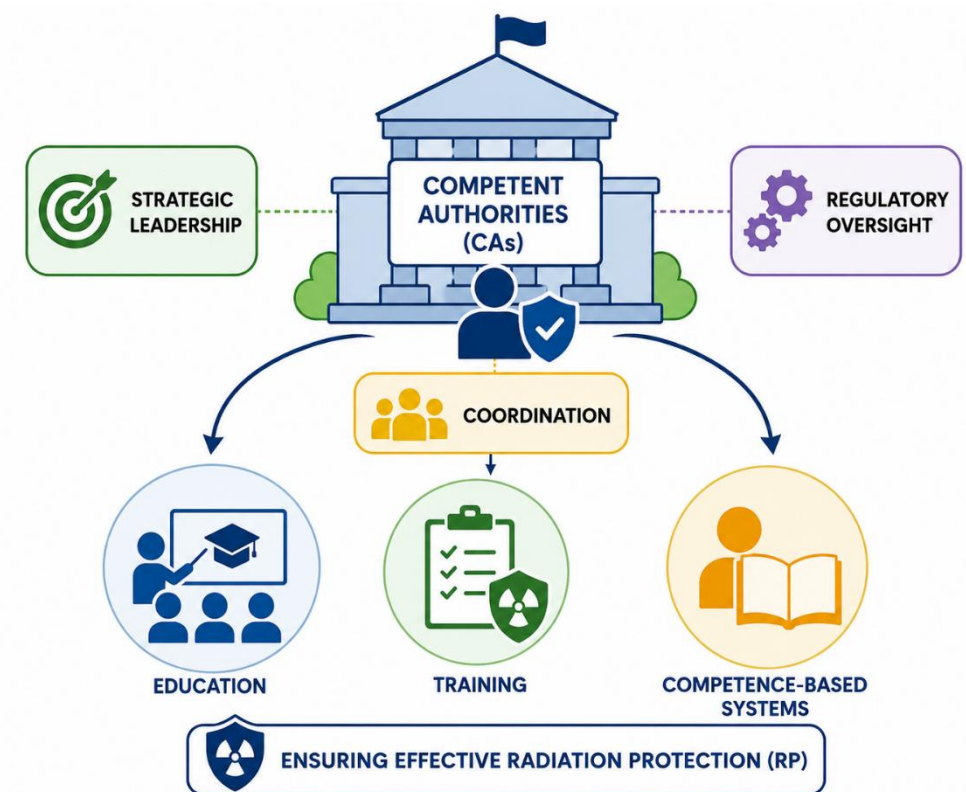
Qualification-based Vs Competence-based approach

- Traditional approach:
 - Diplomas
 - Academic qualifications
 - Training hours, etc.
- Competence-based approach:
 - Demonstrated abilities
 - Practical performance
 - Continuous development
- **Key question:** "What can the individual safely do?" rather than "What training has the individual attended?"



Competent authorities (CAs)

- Competent Authorities (CAs) have a central strategic, regulatory, and coordinating role in ensuring that Education and Training (E&T) in radiation protection is effectively implemented.
- In this respect, CAs can play the role of leaders in developing competence-based systems that ensure radiation protection and safety in applications with ionizing radiation.



The role of CAs

- CAs establish and oversee national frameworks that ensure initial education, practical training, and retraining of RPEs, RPOs, occupationally exposed workers, etc.
- CAs have the responsibility to recognize RPEs and, where national legislation requires, RPOs.
- CAs establish requirements to ensure that occupationally exposed workers receive appropriate initial training, periodic refresher training adapted to their specific work.



HERCA Information Paper

Heads of European Radiological Protection Competent Authorities

Information paper:

Experience in the use of a graded approach for the implementation of the RPE/RPO concepts in the HERCA Member States

Author(s):

HERCA WG on Education and Training (WGET)

The role of CAs

- CAs should move beyond simply verifying academic qualifications and instead adopt competence-based assessment.
- CAs should continuously review E&T programs to ensure that professionals remain competent in new technologies and associated radiation protection challenges.
- CAs should apply a graded approach in requirements concerning qualifications and competence for the persons involved in radiation practices.



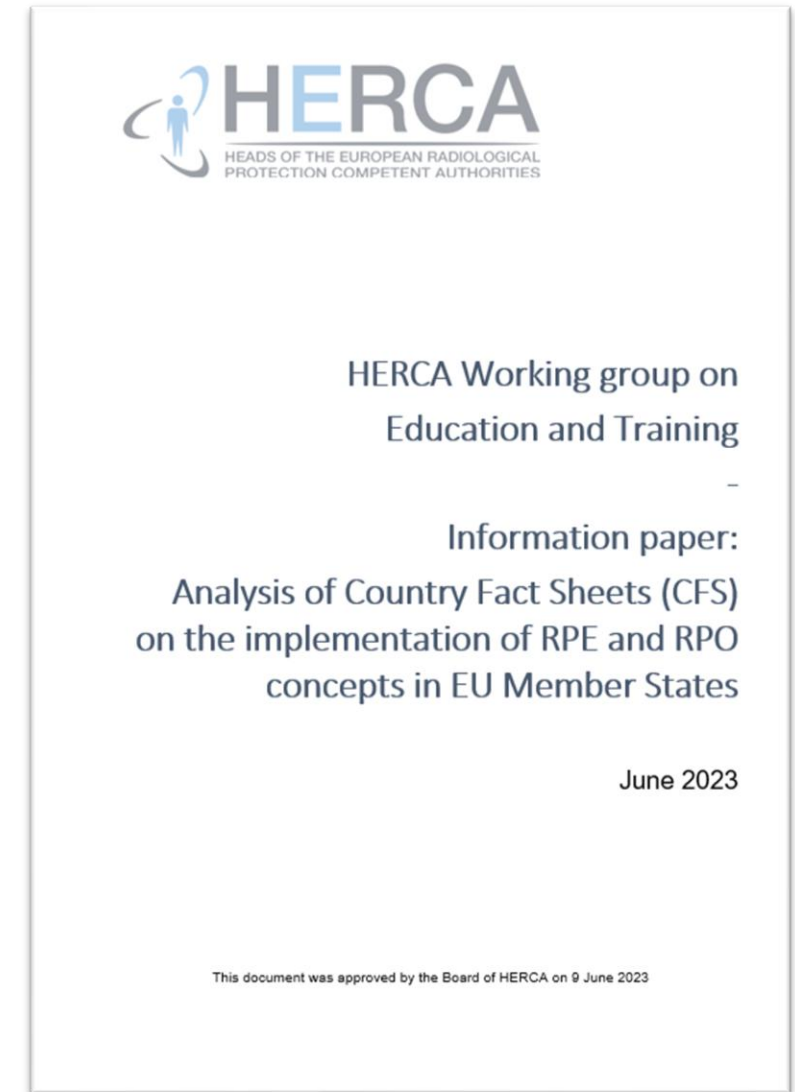
The role of CAs

- CAs should maintain communication channels with European and International organizations to exchange experience, develop common training initiatives, and disseminate good practices.
- CAs should act as facilitators of cooperation and knowledge exchange.



Implementation of RPE and RPO concepts

- Analysis of Country Fact Sheets (CFS) from 29 HERCA MS showed:
 - RPE implemented in 28 countries.
 - RPO implemented in 26 countries.
 - Combined RPE/RPO functions in several countries.
 - Differences in implementation among MS.
- Graded approach is increasingly applied to related requirements including the necessary competences.



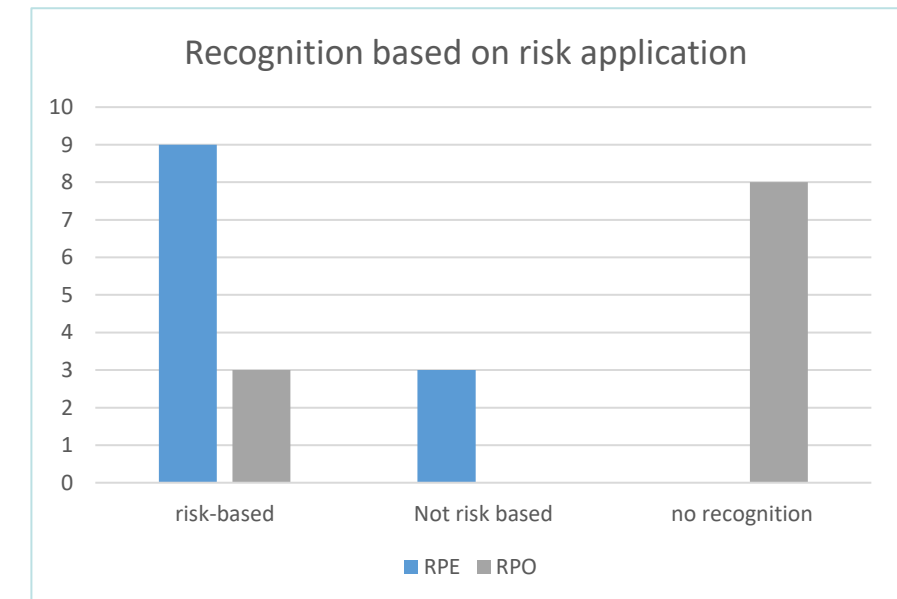
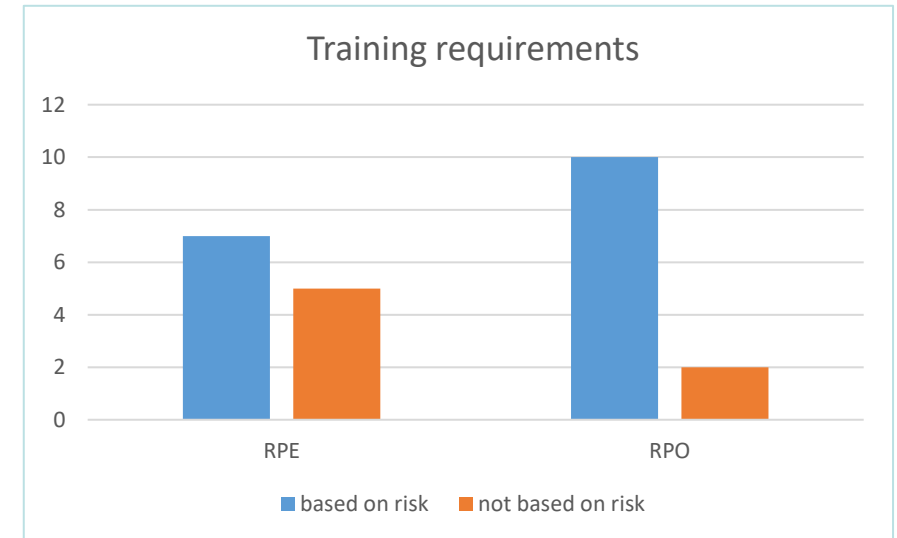
The graded approach

- It is an optimization tool that ensures that the strictness of regulatory measures matches the level of risk involved.
- It helps use resources more effectively and makes the regulatory system more efficient and adaptable.
- In this respect, competence requirements may vary based on:
 - Radiation risk
 - Complexity of the facilities/applied practices
 - Type of practice(s)
 - Potential consequences



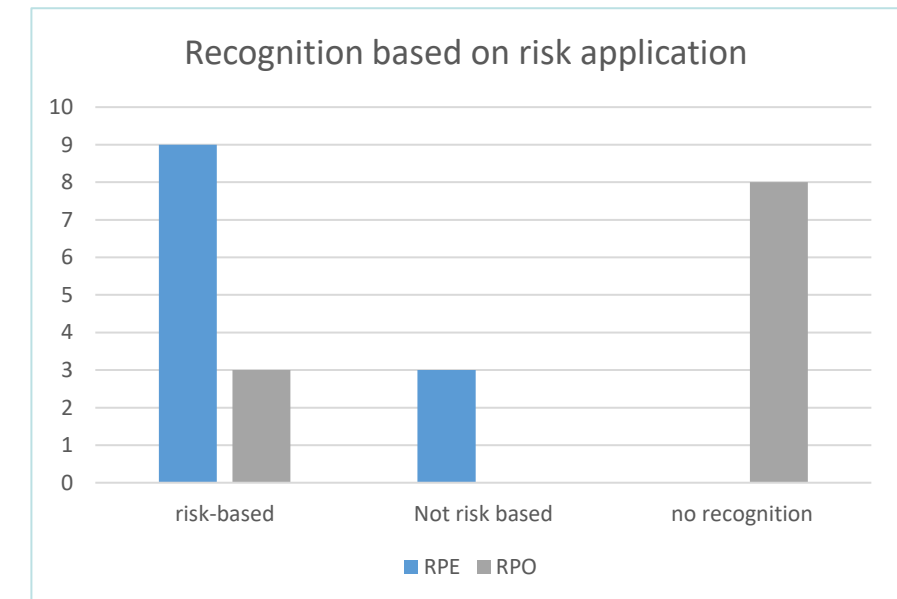
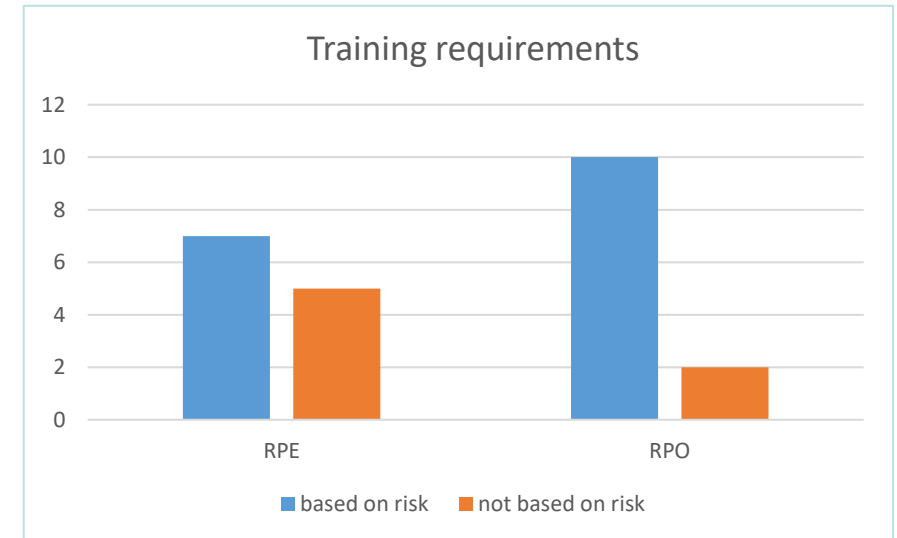
Implementation of RPE and RPO concepts

- Most MS apply a context-specific approach to the training required for both RPE and RPO.
- Education, training, experience and assessment requirements are adapted to the type of practice and the radiological risk.
- According to the analysis of CFS, recognition procedures for RPE exist in 28 of the 29 responding MS, while only 12 have a recognition process in place for RPO.



Implementation of RPE and RPO concepts

- Training and qualification requirements for RPEs and RPOs are set according to the level of radiological risk associated with the radiation practice.
- MS implemented various training pathways, which may include basic safety courses for low-risk applications or postgraduate and specialised programs for more complex facilities/practices.



Competence is not static...

- Several HERCA MS already require periodic retraining of professionals and implement recognition renewal mechanisms.
- CAs increasingly require:
 - Continuing professional development (CPD)
 - Re-certification
 - Evidence of practical experience.



Challenges for CAs

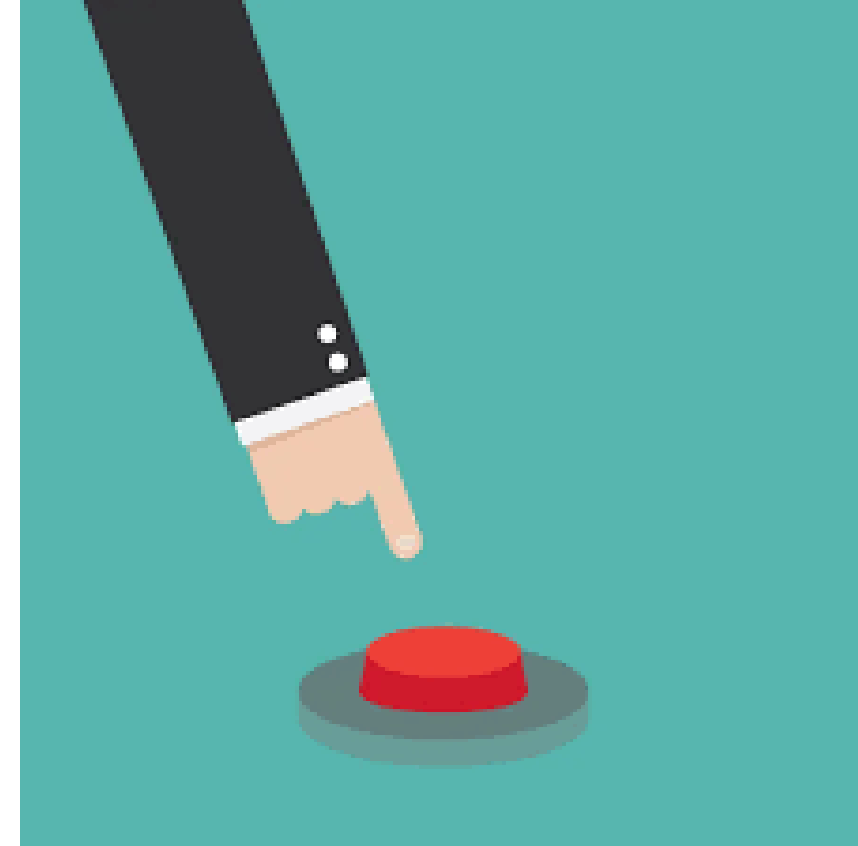
- The main challenges for CAs, among others, concern:
 - Rapid technological developments
 - AI-assisted applications
 - Advanced radiotherapy techniques
 - NORM industries
 - Small Modular Reactors (SMRs)
 - Cybersecurity
 - Workforce ageing
- Future competence requirements may differ significantly from today's requirements.



Suggested actions

To facilitate the implementation of a competence-based framework, CAs should:

- Adopt risk-informed competence requirements
- Strengthen recognition frameworks
- Promote continuous learning
- Develop competency assessment methodologies
- Enhance cooperation with related European and International organisations
- Integrate competence management into regulatory oversight



Key reflections

- Competence is more important than E&T background alone.
- There is a diversity in the implementation of competence-based frameworks among MS.
- Practical experience and supervised workplace training are critical components of competence.
- A graded, risk-informed approach should underpin E&T and competence requirements.
- Continuous professional development is essential throughout a professional's career.



Final reflection

- Radiation protection is ultimately ensured by competent people, not by regulations alone.
- The role of CAs is to ensure that the right competences are available, maintained and applied where they are needed most.





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Thank you for your attention

