



Implementing Competence-Based Training for Radiation Protection Officers in the Netherlands following the EU Basic Safety Standards

Jacoba Beiboer
University of Groningen





Presentation Overview

- Background
- Development of the RPO-DRM framework
- RPO-DRM D
- Competencies
- Qualification descriptors & learning outcomes
- Dutch educational system for RPOs
- Reflection





Background

EU LEGISLATION DRIVES CHANGE



Council Directive
2013/59/Euratom
published in 2013



Revised European
Basic Safety Standards
(EU-BSS)

Safety when working with
ionizing radiation and
radioactive materials



Training for RPOs
must be **specific to**
the **applications** in
which they operate



Member States
transposed by
6 February 2018

Revisions of national
regulatory frameworks
and education systems



In the Netherlands: thorough revision of the RPO training system

From **generalist courses** → to **application-specific, competence-based** education

ANVS REQUEST (2015)



ANVS

Netherlands Authority
for Nuclear Safety and
Radiation Protection



Revise training system
for RPOs



Develop competencies
relevant to specific
work environments



Tailored to specific
applications of
radioactive materials
e.g. research, nuclear
medicine



Development of the RPO-DRM Qualification Framework

WORKGROUP RPO-DRM



The University of Groningen (UG) chaired the workgroup

- ✓ **Task:** formulate the qualification descriptors for RPO-DRM
- ✓ Formulated a **gradual approach**: the required knowledge and competences increase as the risk of the application increases.

THREE RPO-DRM LEVELS

Corresponding to laboratory risk levels

Knowledge & competences
increase

Higher
risk

RPO-DRM D



For radionuclide laboratories at D level

RPO-DRM C



For radionuclide laboratories at C level

RPO-DRM B



For radionuclide laboratories at B level

DRM-B is comparable to RPE

Required level of knowledge is comparable and no separate training is needed

QUALIFICATION DESCRIPTORS



The workgroup described **qualification descriptors** for level **C** and **D**.



Workgroup members

Qualification Descriptors
for the training of
Radiation Protection Officer
for
Dispersible Radioactive Materials
Level D
(RPO-DRM D)



WORKGROUP



university of
 groningen

Jacoba Beilboer (RUG)
Hielke Freerk Boersma (RUG)
Arjo Bunscoeke (RUG)
Frits Pleiter (RUG)
Andre Zandvoort (RUG/UMCG)



Simon van Dulleman (LUMC/Boerhaave Nascholing)



Amsterdam UMC
University Medical Centers

Jos van den Eijnde (UVA/AMC)



Heleen van Elsäcker-Degenaar (NRG)
Peter de Jong (NRG)



Sija Geers-van Gemeren (NVMBR)



ANVS
Netherlands Authority
for Nuclear Safety and
Radiation Protection

Barbara Godthelp (ANVS – advisor)



Hanze
University of
Applied Sciences

Age Froma (Hanzehogeschool)
Stijn Laarakkers (Hanzehogeschool)



UMC Utrecht

Kitty Hoonstra (UMCU)



GE Healthcare

Mark van Mierlo (GE Healthcare)



PRA
Radiation Protection Advisors

Henk Poelman (PRA)



TU Delft

Marcel Schouwenburg (TUD/NCSV)
Frans Wiersma (TUD/NCSV-Utrecht)



Mallinckrodt

Xandra Velders (Mallinckrodt)



Vrije
Universiteit
Amsterdam

Gertrud Warmerdam (VU)



Focus on RPO DRM – level D

MULTIPLE DISCIPLINES



Radiation physics



Radiobiology



Internal dosimetry



Legislation



DIVERSE TASKS



Informing



Supervising



Monitoring



Risk assessment



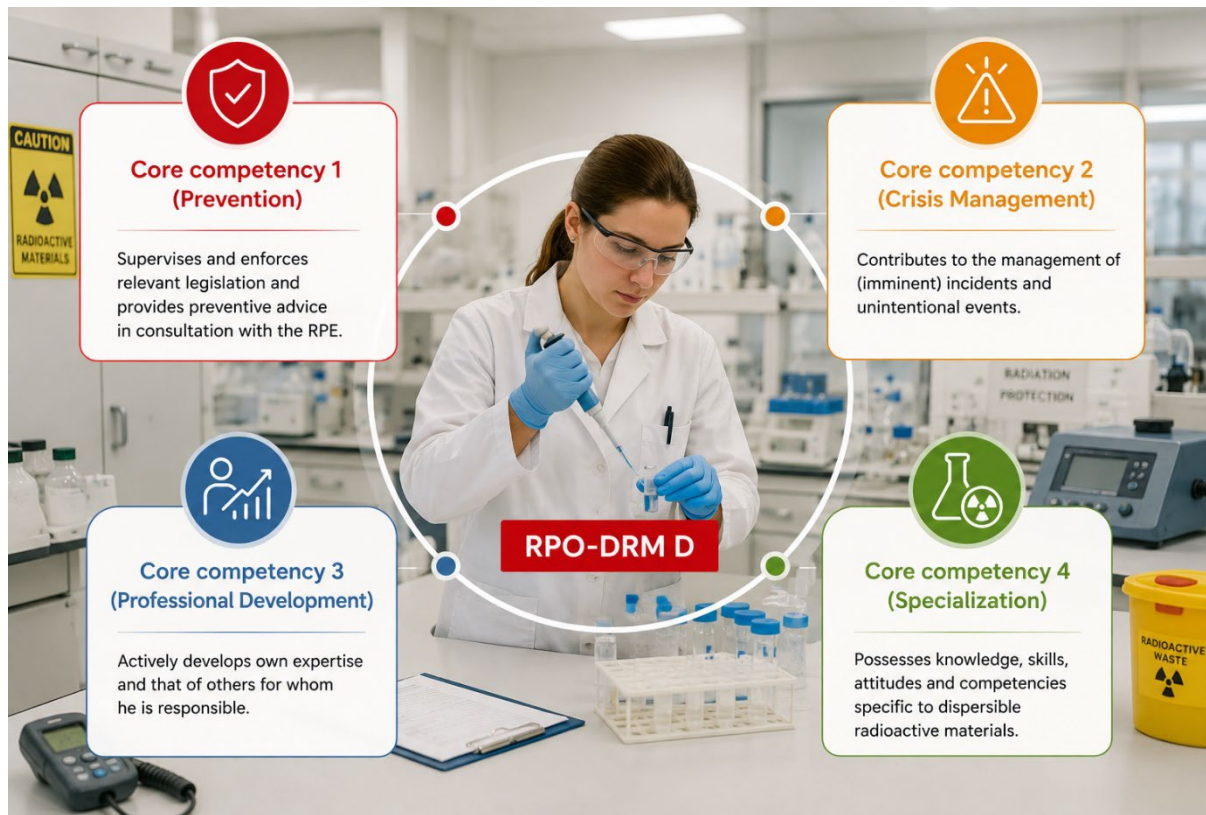
Protocol development



Administration



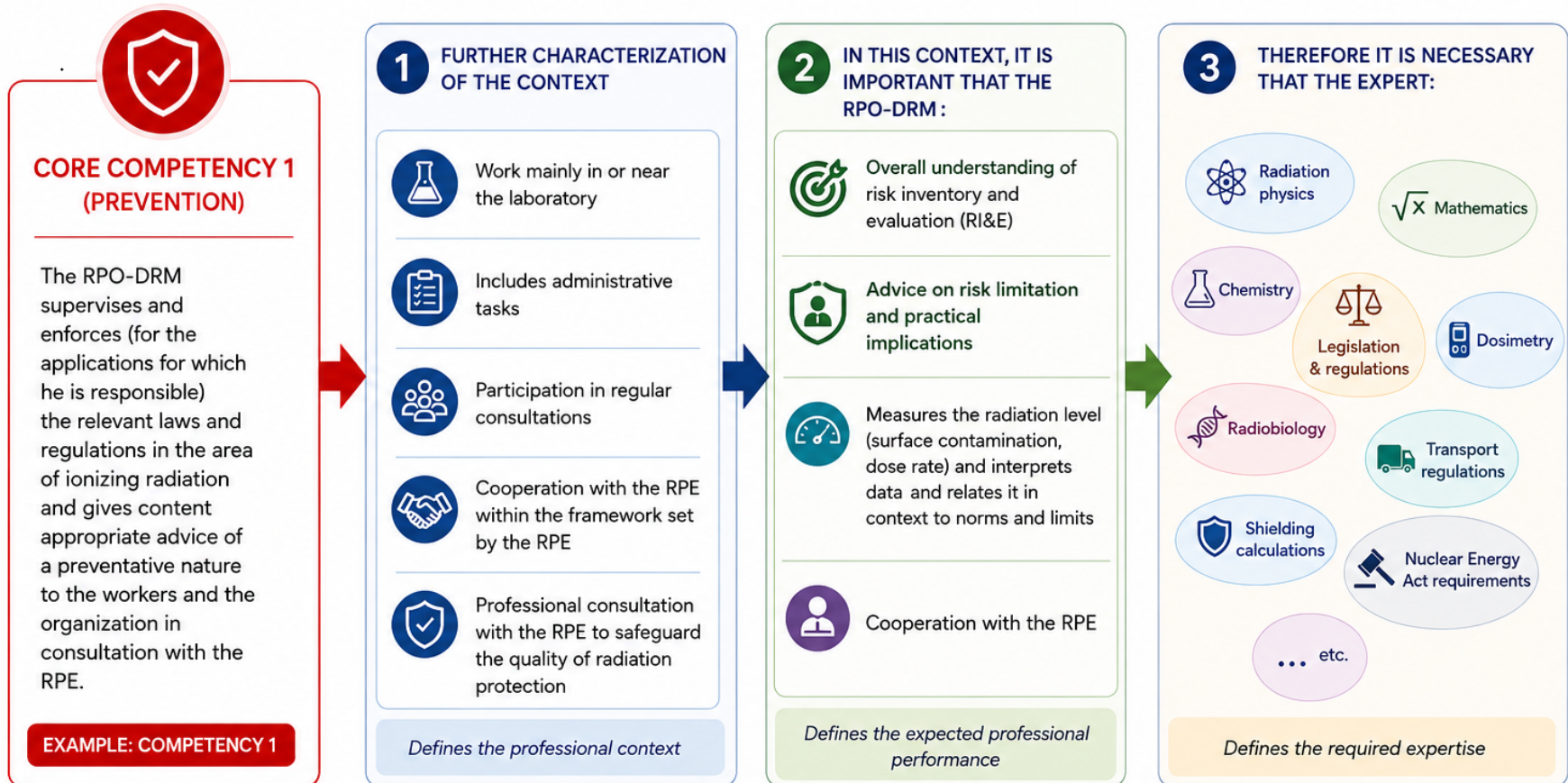
Four core competencies



Qualification descriptors + learning outcomes
tailored to specific applications

Qualification descriptor & learning outcomes

A consistent three-step structure is used for all four core competencies



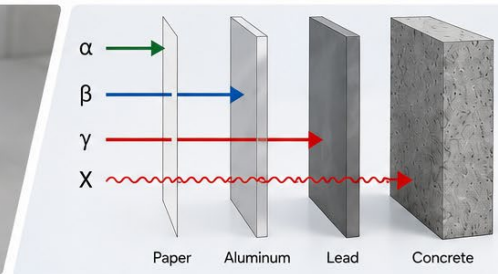
Radiation protection practicals

Learning outcomes for radiation practicals

Summary of the specific and practical learning outcomes based on the qualification descriptors.

The Radiation Protection Officer:

- Works with various measuring techniques (such as liquid scintillation counting, Geiger-Müller counters, proportional counters, NaI, ionization chambers).
- Works with contamination monitors
- Performs reliable dose rate measurements
- Decontaminates objects
- Uses radioactive sources in a safe manner
- Performs wipe tests
- Understands shielding and radiation characteristics





Appendix: keywords lesson material

TABLE OF KEYWORDS

The table gives a minimum number of subjects that should be addressed in the training program.

The column headings **K**, **S** and **C** stand for **Knowledge**, **Skills** and **Competencies**.

SUBJECT AREAS

	1. General
	2. Basic Competencies
	3. Natural Radioactivity
	4. Detection
	5. Dosimetry
	6. Biological Consequences of Radiation
	7. Organization and Legislation
	8. Organizational Aspects of Radiation Protection
	9. External Irradiation
	10. Internal Contamination
	11. Practical Aspects
	12. Risk Inventory & Evaluation
	13. Organizational

EXAMPLE: 1. GENERAL (EXCERPT)

Subject	K	S	C
Atom structure	X		
Ionization, excitation	X		
Radioactive decay, half-life	X	X	
Decay formulas and decay constant	X	X	
Specific activity	X		
α -, β -, γ -decay, electron capture, internal conversion	X		
Energy spectra α -, β -, γ -emitters and Bremsstrahlung	X		
Inverse square law	X	X	
Interaction mechanisms for α -, β -, γ -emitters	X		
...			



Assessment

To qualify for the RPO-DRM D Diploma,
a candidate must achieve a sufficient grade for:

- ✓ Examination
- ✓ Radiation Practical



RPO-DRM D Diploma

The assessment procedure and method
are defined in the exam regulations of
the authorized organization.

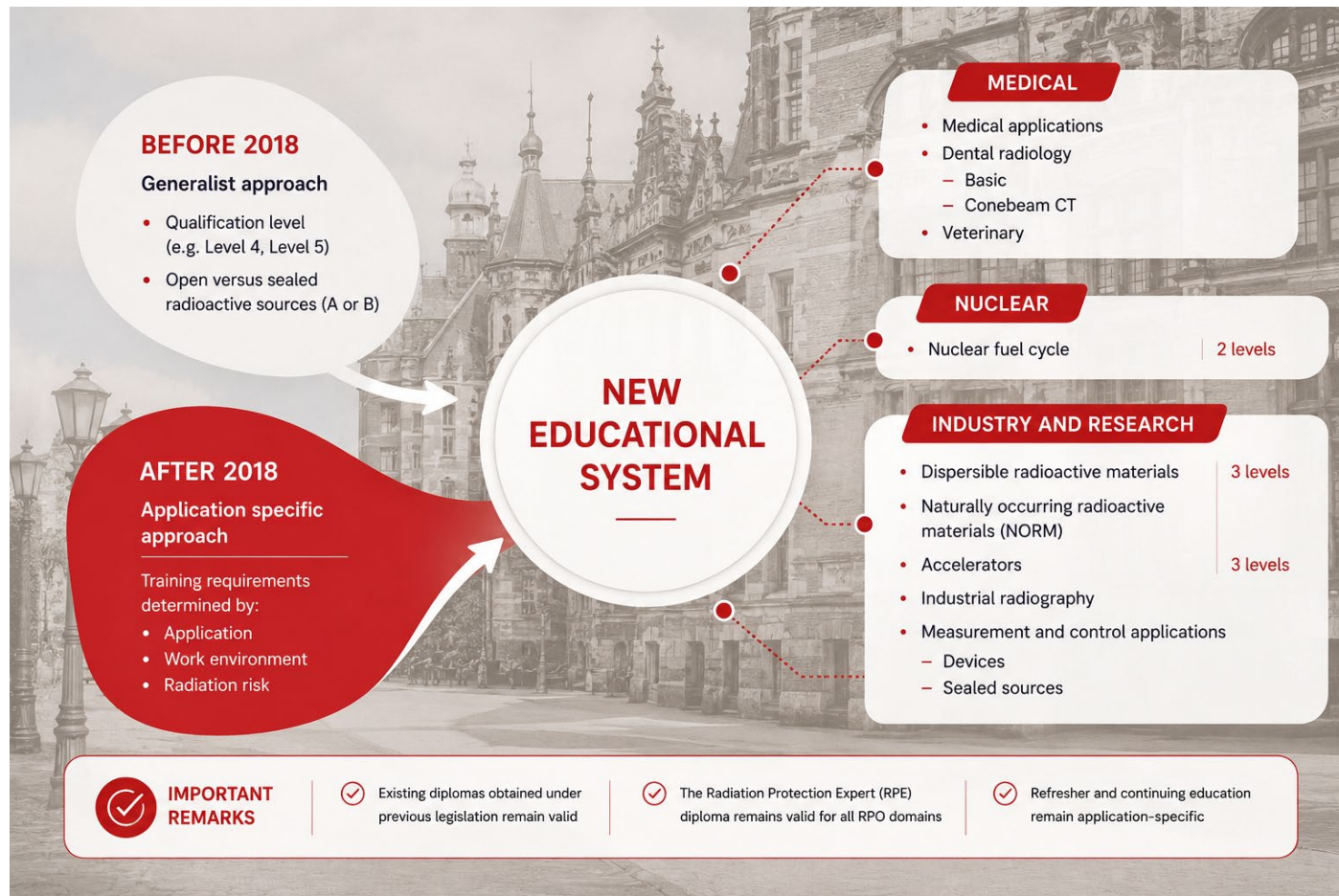
Additional skills

Such as instructing, advising, writing protocols,
etc., may be assessed through assignments,
presentations, discussion sessions
(360° feedback), etc.





Educational system for RPOs





Reflection

ACHIEVEMENTS

Integrated into national regulations

Incorporated into the
Radiation Protection Basic
Safety Standards Regulation
(RBS, Appendix 5.2)

Better aligned with the work environment

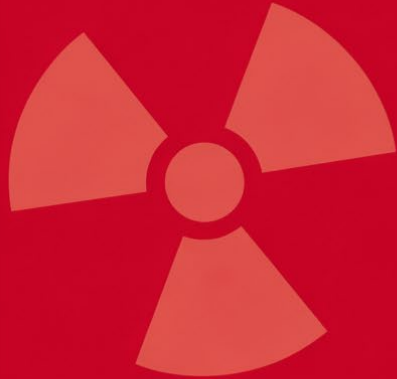
Training requirements linked
to application, work
environment and
radiation risk

Greater emphasis on practical and soft skills

Increased focus on
practical performance,
communication, instruction
and advisory skills

REMAINING CHALLENGE

Further alignment is needed to reduce
ambiguity and overlap between
qualification profiles.



GARP

Groningen
Academy for
Radiation
Protection

Thank you for your attention

Questions?