



Erasmus+

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KNOWLEDGE IN ACTION

KU LEUVEN



Evaluation of the present RP E&T programs in general in Europe, in view of the new EU-BSS and the development of the Erasmus+ Blended Learning platform

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**Blended learning in radiation protection and radioecology**  
(e-learning modules)

# Erasmus+ project

“Blended learning in radiation protection and radioecology”

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- ▶ **Aims and objectives of the project**
- ▶ **Task UHasselt :Analysis of the present situation of E&T RPE-RPO**
  - ▶ Short action plan
- ▶ **Conclusions**

# Project vision

“Blended learning in radiation protection and radioecology”

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*What are we trying to achieve?*

- ▶ PHASE 1 : To increase **student’s employability** by offering a program which respond to the market needs:
  - ▶ E-learning platform
  - ▶ Real mobilities
  - ▶ Internships
  - ▶ Certification (Europass Certificate Supplement and ECTS for students)
- ▶ PHASE 2 : To increase the qualifications of the **people already involved in the work market** by:
  - ▶ Extending the e-learning modules to this specific audience

**Duration:** 01-09-2015 until 31-08-2017

# Partnership

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- ▶ 8 Academic Partners (from the CHERNE network) representing **7 countries**:
  - ▶ HAUTE ECOLE PAUL-HENRI SPAAK – **BELGIUM**
  - ▶ **UNIVERSITEIT HASSELT (UHasselt)- BELGIUM**
  - ▶ FACHHOCHSCHULE AACHEN (FH Aachen) - **GERMANY**
  - ▶ UNIVERSITA DI BOLOGNA (UNIBO) - **ITALY**
  - ▶ UNIVERSIDADE DE COIMBRA - **PORTUGAL**
  - ▶ CZECH TECHNICAL UNIVERSITY IN PRAGUE (CUT) – **CZECH REPUBLIC**
  - ▶ NATIONAL TECHNICAL UNIVERSITY OF ATHENS (NTUA) - **GREECE**
  - ▶ UNIVERSITAT POLITECNICA DE VALENCIA (UPV)- **SPAIN**
- ▶ 2 Non-academic partners to add value to the partnership:
  - ▶ a research institute: THE NATIONAL RADIATION PROTECTION INSTITUTE (SURO) – **CZECH REPUBLIC**
  - ▶ a regulatory body: GREEK ATOMIC ENERGY COMMISSION - **GREECE**

# 3 target groups

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1. **Students** of the participating institutions
2. Persons already involved in the **work market**
3. **Teaching staff**

# Objectives

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- ▶ **Development of a **blended learning** program** in radiation protection and radioecology
- ▶ **Life long learning education program** for people already *involved* in radiation protection
- ▶ **Acquisition of **specific competences**** in the nuclear field for those who were *not involved* in nuclear and radiological techniques during their studies
- ▶ **Contribution towards **standardization** of the knowledge across Europe** in radiation protection and safe use of radioactive materials

# Intellectual outputs: deliverable proposed

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- ▶ O1: Analysis of the present situation in radiation protection and radioecology within the European countries
- ▶ O2: Implementation of course modules on an e-learning platform
- ▶ O3: Trainings in Radiation Protection and Radioecology

# O1: analysis of the present situation in radiation protection and radioecology within the European countries

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- ▶ Leader: UHasselt
- ▶ Participants: all
- ▶ Aim:
  - ▶ Evaluation of the present situation
  - ▶ Evaluation of the need of the labor market in terms of skills and competences
- ▶ Deliverable:
  - ▶ Report to be published on the project website
- ▶ NO MONEY FOR THAT so need to find cheap solutions
- ▶ **DEADLINE IS: May 2016**



# Erasmus+ project

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- ▶ Aims and objectives of the project
- ▶ Task UHasselt : analysis of present situation of E&T RPE-RPO
  - ▶ Short action plan
- ▶ Conclusions

# O1: short action plan proposal

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## How to start our search on E&T needs in RP&RE?

- ▶ **Step 1: Analysis of already existing data – UHasselt**
  - ▶ Implementation of new BSS
  - ▶ Questionnaire and results of task force HERCA
  - ▶ ENETRAP3
  - ▶ Recommendation of Belgian Society of Radiation Protection (BVS)
  - ▶ Discussion with FANC
  
- ▶ **Step 2: Creation of a questionnaire**
  - ▶ specifically focused on the course we wanted to develop – UHasselt
  - ▶ distributed to all the partner who transfer it to their list of contacts
  - ▶ Analysis by UHasselt

# New EU-BSS

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## ▶ RPE - RPO

- ▶ **Article 4** definition 73 and 74 of RPE and RPO
- ▶ (73) "radiation protection expert" RPE means an individual or, if provided for in the national legislation, a group of individuals having the knowledge, training and experience needed to give radiation protection advice in order to ensure the effective protection of individuals, and whose competence in this respect is recognized by the competent authority;
- ▶ (74) "radiation protection officer" RPO means an individual 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;
- ▶ **Articles 82 and 84** summing the tasks of RPE and RPO

# New EU-BSS

## CHAPTER IV : **REQUIREMENTS** FOR RADIATION PROTECTION EDUCATION, TRAINING AND INFORMATION

### **Article 14**

- ▶ **General responsibilities** for the education, training and provision of information
  - ▶ 1. Member States **shall establish** an adequate legislative and administrative framework ensuring the provision of appropriate **radiation protection education, training and information to all individuals** whose tasks require specific competences in radiation protection. The provision of training and information shall be repeated at appropriate intervals and documented.
  - ▶ 2. RPE: Member States **shall ensure** that arrangements are made for the establishment of education, training and re-training to allow the **recognition of radiation protection experts and medical physics experts**, as well as occupational health services and dosimetry services, in relation to the type of practice.
  - ▶ 3. RPO: Member States **may** make arrangements for the establishment of education, training and retraining to allow the recognition of **radiation protection officers**, if such recognition is provided for **in national legislation**.
- ▶ **But no guidance in terms of what is required for education, training and experience is given**

# New EU-BSS

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## **Article 79**

### **Recognition of services and experts**

Member States **shall ensure** that arrangements are in place for the recognition of:

- ▶ (a) occupational health services;
- ▶ (b) dosimetry services;
- ▶ (c) **radiation protection experts**;
- ▶ (d) medical physics experts.

Member States **shall ensure** that the necessary arrangements are in place to ensure the **continuity of expertise** of these services and experts.

**If appropriate**, Member States **may establish** the arrangements for the recognition of **radiation protection officers**.

# NEW EU-BSS : in summary

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## Implementation of new EU-BSS by member states

- ▶ Lot of flexibility for implementation
- ▶ RPE / RPO different approach
- ▶ Guidance lacking
  
- ▶ Hamper harmonisation and mutual recognition
- ▶ Unless...

# O1: short action plan proposal

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- ▶ **Step 1: Analysis of already existing data – UHasselt**
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# HERCA : Heads of the European Radiological protection Competent Authorities

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- ▶ <http://www.herca.org/index.asp>
- ▶ 51 Authorities from 31 European countries (incl. the 28 EU MS)

## Milestones

- ▶ Set up a Task Force : Education and training in RP : November 2012
- ▶ Formulated recommendations in November 2013
- ▶ Organised a workshop : Implementation of RPE/RPO : July 2015, Paris



# Task Force E&T RP of HERCA

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## ▶ Mandate on E&T in RP

- ▶ Present the general picture of the situation of E&T in RP
- ▶ Identify current needs for harmonization among HERCA MS
- ▶ Mandate for future working group (summer 2016?)

## ▶ Mandate on RPE

- ▶ Analyse the applicability between HERCA members of the procedure developed by ENETRAP for the benchmarking of national E&T on RP
  - WP7 ENETRAP 3 : draft of guidance!

## ▶ Mandate on RPO

- ▶ make a survey on the current RPO requirements in the different HERCA MS
- ▶ Survey had high response! 26 of 31 countries participated



Heads of the European Radiological  
protection Competent Authorities

**Conclusions & Recommendations  
by the HERCA Task force on  
Education & Training in  
Radiation Protection  
(TF E&T-RP)”**

**Ton Vermeulen**

**Presented at Euterp workshop Rovinj, 2014**

# Results Questionnaire RPO (2)

## Question 2

**Primary tasks and responsibilities associated with the role of the RPO**

<b>Primary tasks described in BSS</b>	<b>Harmonization &gt;50%</b>
Ensuring accordance with the requirements of any specified procedures or local rules	<b>100%</b>
Supervise implementation of the program for workplace monitoring	55%
Carrying out periodic assessments of the condition of the relevant safety and warning systems	60%
Supervise implementation of personal monitoring program	60%
Participating in arrangements for prevention, preparedness and response for emergency exposure situations	60%
Information and training of exposed workers	60%

# Results Questionnaire RPO (2)

## Question 2

**Primary tasks and responsibilities associated with the role of the RPO**

<b>Primary tasks described in BSS</b>	<b>Harmonization &lt;50%</b>
Supervise implementation of the program for health surveillance program	<b>25%</b>
Providing new exposed workers with an introduction to local rules and procedures	10%
Maintaining adequate records of all radiation sources	40%
Establishing work plans	30%
Providing reports to the local management	40%
Contact with the RPE	25%

# Results Questionnaire RPO (2)

## Question 2

**Primary tasks and responsibilities associated with the role of the RPO**

<b>Primary tasks NOT described in BSS</b>	<b>Harmonization</b>
Contact with the regulatory authority	50%
Storage of waste	30%
QA management systems	30%

### **Conclusion :**

- Partly similar to tasks for RPO described in BSS
- RPOs role in most cases includes tasks of the RPEs role, e.g.
  - QA program
  - Contact with regulatory authority

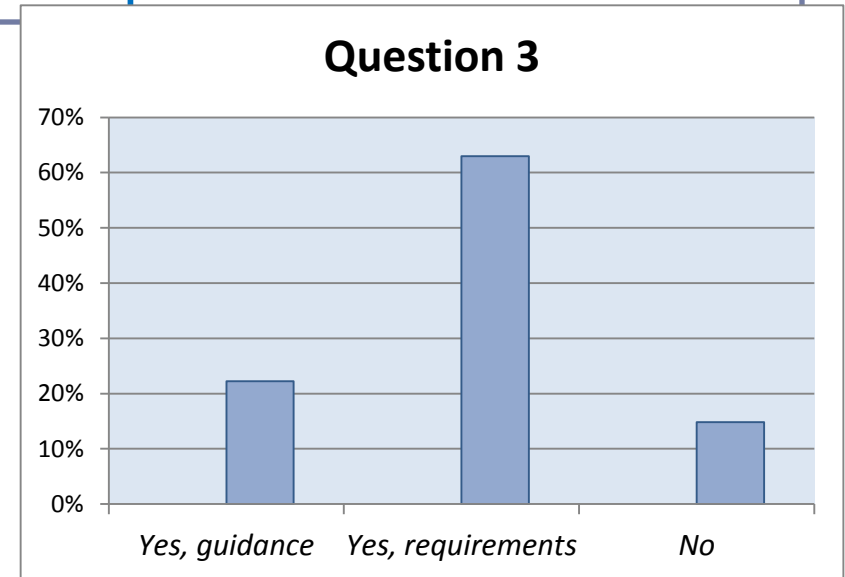
### **Needs**

- Harmonization of tasks for RPOs
- Definition of specific tasks/responsibilities for RPO and RPE

# Results Questionnaire RPO (3)

## Question 3

Are regulatory **guidance/requirements available** that specifies the **minimum level for** education, training, work experience and personal attributes that are required for RPOs?



Guidance/Requirements	% of yes
Education	60%
Training	70%
Personal attributes (qualification, competence)	48%
Renew personal attributes	30%
Work experience	30%

**Yes: 85%**  
**No: 15%**

# Results Questionnaire RPO (3)

## Question 4

Within your country are there any radiation protection training courses provided especially for RPOs (or their equivalent)

No : Belgium, Bulgaria, Estonia, Iceland, Luxembourg (Cyprus and France skipped)

Yes : 19 countries

14 countries have different E&T and work experiences of RPO recognized with regards to the complexity of the applications in different areas.

No different E&T: Hungary, Ireland, Norway, Portugal, (Sweden skipped)

## **Conclusion :**

- Most countries have a training scheme for RPOs, but a lot of differences
- Lack of comparison of existing E&T training programs for specific RPOs
- A majority differentiate the training schemes according to the application field but still 10 countries have no or no differential E&T program especially for RPOs

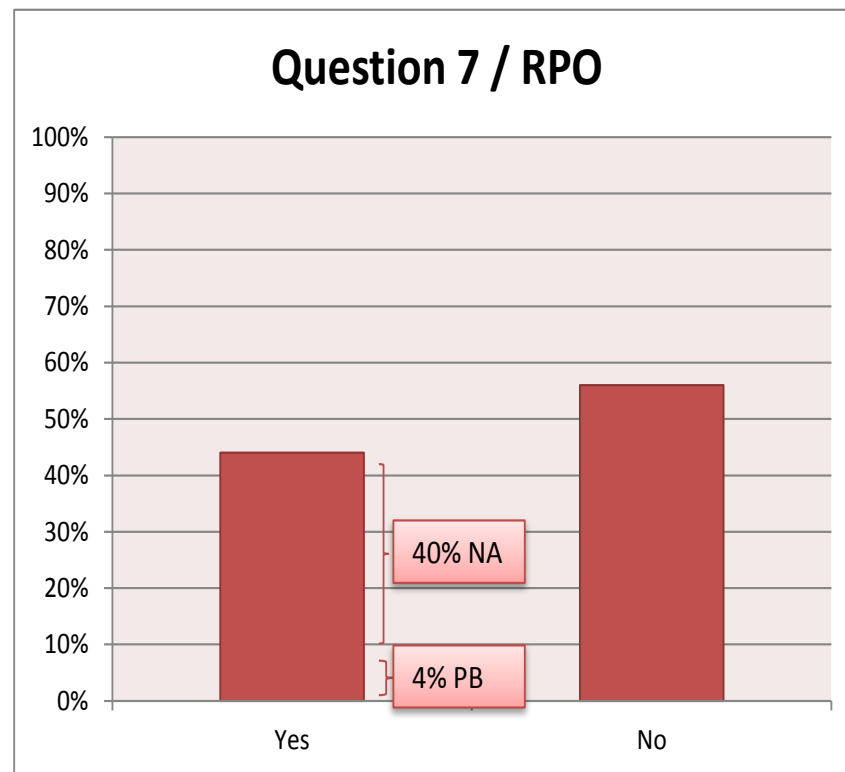
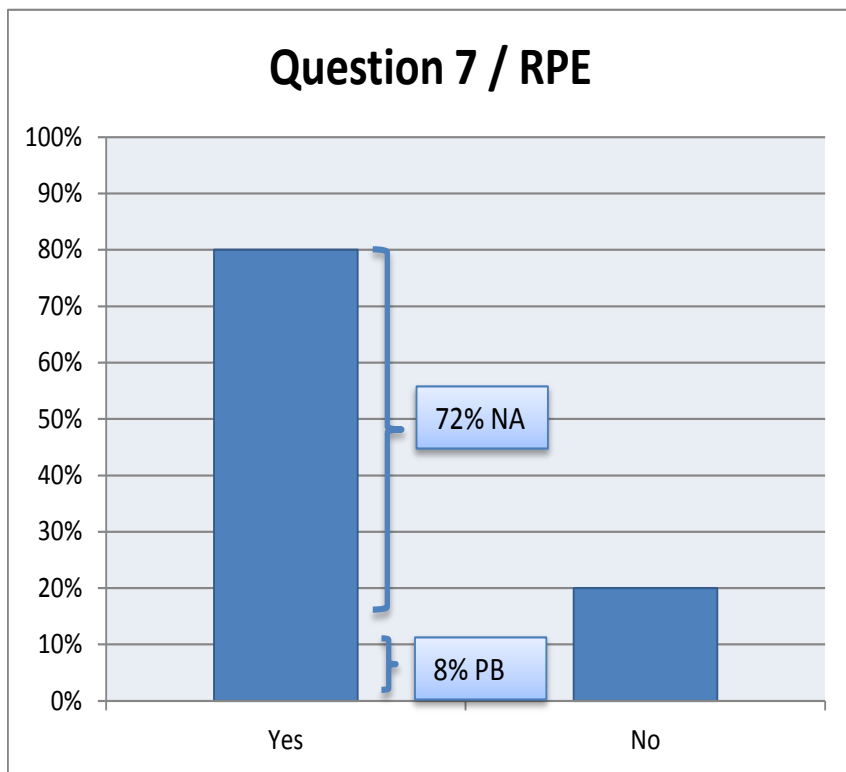
# Results Questionnaire RPO (5)

Question 7: Are there **formal systems** in place for the **recognition** of RPEs or RPOs in your country by national authorities (NA) or professional bodies (PB)?

NA : national authority,  
PB : professional bodies

**80 % RPE**

**45% RPO**





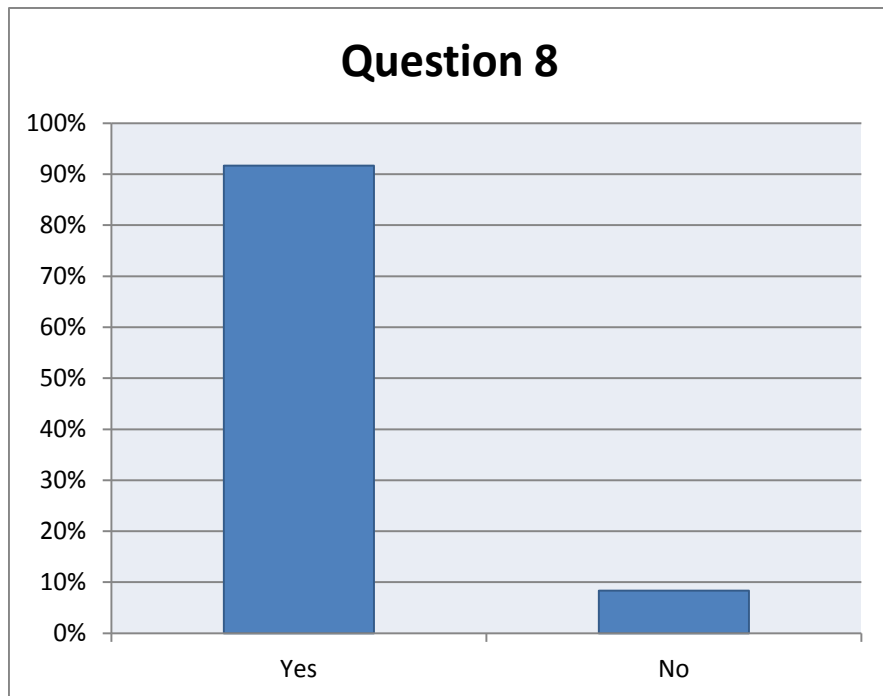
# Results Questionnaire RPO (6)

Questions 8 and 9 (If a formal recognition system for the RPO is in place (12))

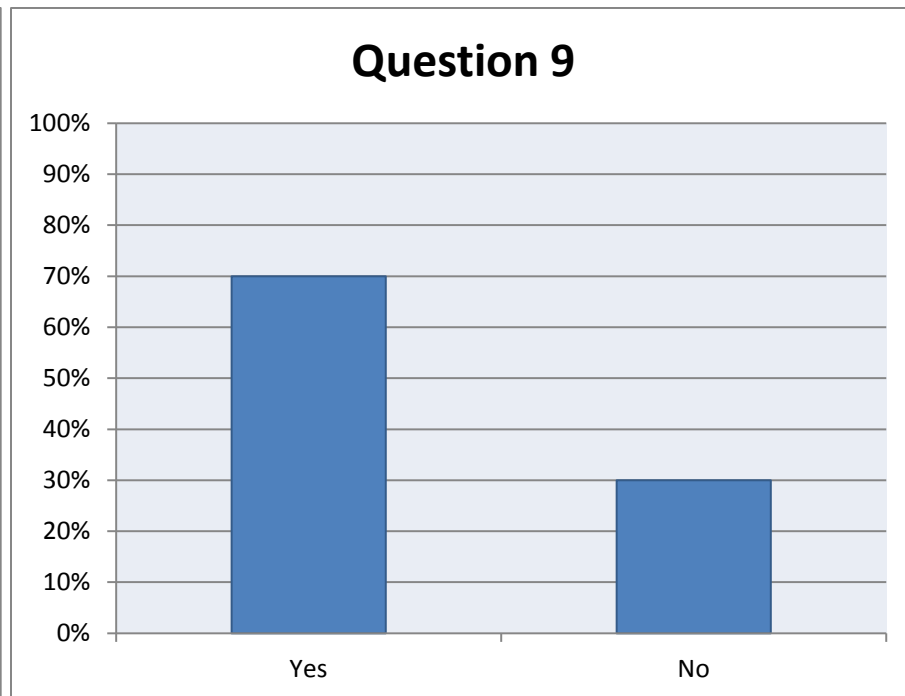
8. Is there a **minimum level** of basic education, training and experience required for the recognition of RPO?

9. Once the prerequisites are fulfilled, is successful completion of any of the courses identified in Question 5 **sufficient for recognition** as RPO?

100% = 12 answers



100% = 10 answers



# Conclusions and Recommendations HERCA

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- ▶ **Great flexibility of RPE/RPO and E&T requirements**
  - ▶ Harmonization not realistic?
- ▶ **Existing regulations needs to be updated**
  - ▶ BSS directive allows a multitude of options for implementation
- ▶ **Development of guidance (ENETRAP3):**
  - ▶ On duties and required practical competences of RPE
  - ▶ On role of RPO and required training and competences
- ▶ **With input of HERCA members,**
  - ▶ and recognition as a reference for HERCA members and national authorities should follow it
- ▶ **After implementation of new BSS and development of guidance (Future task force HERCA)**
  - ▶ **New survey** on how BSS is transposed in national systems
  - ▶ Possible development of **mutual recognition system** for RPE

# O1: short action plan proposal

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# ENETRAP 3 (2014-2018)

<http://enetrap3.sckcen.be/en>

<u>WP1</u>	Project coordination	
<u>WP2</u>	Organisation of “think-tank” activities and establishment of partnerships ensuring feedback from stakeholders	
<u>WP3</u>	Establishment of three specialized training modules for RPE and implementation of pilot sessions	Geological disposal (07/2016) NPP and RR (06/2016) Medical applications (09/2015)
<u>WP4</u>	Development of a train-the-trainer (TTT) strategy and organisation of a TTT training event	<b>June 6 - 10, 2016</b> (Sarclay, France)
<u>WP5</u>	Dissemination of project results and contribution to a website for capacity building and transfer of know-how in radiation protection	
<u>WP6</u>	Testing of methodologies for RPE recognition and mutual recognition in practice	
<u>WP7</u>	Writing of guidance to support the implementation of E&T requirements for RPE and RPO as defined in the Euratom BSS	Draft version in evaluation

# ENETRAP 3

- ▶ Focusses on development of RPE training modules and TTT module
- ▶ E-learning using Moodle : ... cooperation ?
- ▶ Level EQF (European qualification framework) : defining level of knowledge, skills and competences.
  - ▶ RPE : level 6-7(Ba-Ma)
  - ▶ RPO : level 3 (Belgium : 2<sup>nd</sup> year of 3<sup>e</sup> stage professional secondary school : certificate not a diploma) - 6 (Ba-diploma): **large variety depending on tasks and responsibilities**

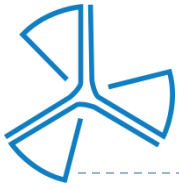
## CONCLUSION

- ▶ different levels between RPE/RPO and within RPO
  - ▶ => different training schemes: basic, advanced, expert
  - ▶ => theoretical and practical
- ▶ Guidance necessary for harmonization :
  - ▶ first draft in evaluation

# O1: short action plan proposal

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# Belgium : BVS recommendations

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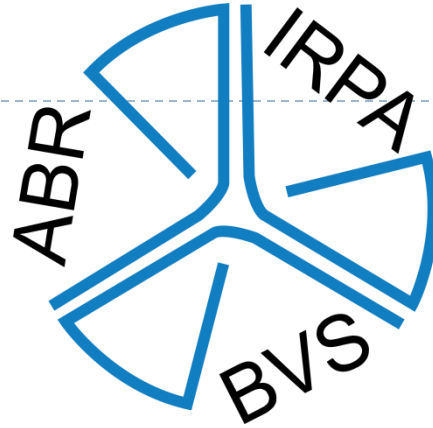
## **Belgian Association for Radiation Protection**

Member of IRPA, active since 51 years  
~ 400 members

Since 2012 : Implementation of RPE – RPO in Belgium ?

- Working group created in 12/12
- Validation of the guidance document in 03/14
- Was presented to regulatory body (FANC) in 05/14

**Selection of recommendations regarding RPE/RPO E&T**



# Challenge of implementing RPE RPO in Belgium Guidance document

P. Froment, T Clarijs, H. Janssens ...  
BVS-ABR working group







# Belgium : BVS recommendations

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RPE : level EQF 7 : academic

Entry requirements

- Master in exact or applied sciences or equivalent diploma (Scientific Council or FANC validation)

RPO : level EQF 6

Entry requirements:

- Bachelor level or equivalent



# Requirements for recognition RPE

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Basic education in RP

- Theoretic + practical exercises : 12 ECTS

+ practical experience on the field

CI I (NPP ...) : **3 years** (6 m RPE tasks),

CI IIA (Cyclotron, ...) : 2 years (6 m RPE tasks),

CI II (Univ., Research center, Ind.) : 1 year (3 m RPE tasks),

CI III (Radiology ...) : **6 months** (3 m RPE tasks),

Transport : 1 year (6 m RPE tasks)



# Requirements for recognition RPO

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Basic education in RP

- Theoretic and practical exercises :

50 h (CI I and II), 8 h (CI III)

+ practical experience on the field

Defined and 'supervised' by the RPE

20 h (CI I and II)

8 h (CI III).



# Recognition procedure

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## RPE

- Given by FANC (Federal Authority)
- For one type of installation (ex. CI II sealed and non sealed source)
- Validity : 2 years (first recognition)  
5 years (following)

## RPO

- Official designation by the exploitant (contract ...)
- After advice of RPE
- Validity : 5 years



# Continuous Professional Development RPE/RPO

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## RPE

- Min 200 pts / 5 y (CI I - IIA)
  - Min 100 pts / 5 y (CI II - III)
- Cf. table

## RPO

- Min 20 h / 5 y

Min 1 d of external activities (course, conf. ...)

Activity	Remarque / proof	Value	Remarque
Formation	Certificate	10 pts / d	Minimum 100 pts for cl I and IIA  Minimum 75 pts for other classes
Formation with exam	Certificate with test result	15 pts / d	
Conference ....	Certificate of attendance	5 pts / d	
Oral presentation at a conference ...	Conference program	10 pts	-
Poster presentation at a conference ...	Conference program	5 pts	-
Publication in a journal (with jury)	Paper	10 pts	-
Publication in a journal	Paper	5 pts	-
Teaching task (university, college ...)	Course program	2 pts / h	Maximum 20 pts
Active member in an (inter)nationale commission	List of participants	10 pts / commission	-

# Remarks

## ▶ Uniformity-harmonization with other MS using ECTS?

BUT...

- ▶ topics are described but no relative importance in terms of ECTS per topic is given
- ▶ no evaluation criteria formulated for knowledge, skills and competences
- ▶ No level indicated (Basic, advanced , expert)

## ▶ Relation topics & Blended learning modules :

- ▶ +++ Large overlap!

<b>TOPICS</b>	<b>MODULE</b>
<b>Nuclear physics and radiation physics</b>	<b>1</b>
<b>Radiochemistry</b>	<b>5</b>
<b>Measurement techniques</b>	<b>2</b>
<b>Radiobiology</b>	
<b>Dosimetry</b>	<b>2</b>
<b>fundamental aspects of radiation protection</b>	<b>3</b>
<b>legislation (Belgian and international),</b>	<b>(3)</b>
<b>Practical aspects of radiation protection (NORM, transport, medical ,industrial, research)</b>	<b>Training</b>
<b>Intervention by accidents and incidents</b>	<b>4</b>
<b>Decommissioning</b>	
<b>Waste management</b>	<b>(5)</b>
<b>ethical aspects of radiation protection</b>	<b>3</b>
<b>General safety</b>	<b>4</b>

<b>1 Basics nuclear and radiation physics</b>	<b>2 Basics of measurement and dosimetry</b>	<b>3 Radiation protection</b>
<b>4 General safety principles</b>	<b>5 Basics radiochemistry and environmental measurements</b>	<b>6 Medical applications</b>



# O1: short action plan proposal

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# Discussion with FANC

## Presentation the Erasmus+ project Blended learning

- ❖ Definitely needed for professionals
- ❖ Flexible for different users and different RP practices

## Discussion of HERCA and BVS data for BELGIUM

RPE and RPO : different tasks => different E&T => both can be in one person

### ➤ RPE :

- ❖ Belgium : high level for RPE (level 7 : academic)
- ❖ Specific E&T and requirements per class (at least 3)
- ❖ Not only advice also responsibilities

### ➤ RPO :

- ❖ Level equal to bachelor diploma
- ❖ basic education + special practical training per practise
- ❖ No recognition but notification
- ❖ Quality is responsibility of exploitant

Mutual recognition EU : problem : local language will be obliged

## Organisation of stakeholders meetings: future invitation

# O1: short action plan proposal

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# Creation of a questionnaire

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- ▶ What do we want to survey?
  - ▶ Minimum of specific questions (max 10)
- ▶ Targets?
  - ▶ Partners
    - ▶ Added value next to existing e-learning modules/training materials
    - ▶ Training support in development of e-learning?
  - ▶ Students/teachers
    - ▶ Implementation of e-learning modules in academic courses
  - ▶ Employers/employees/private trainers
    - ▶ Implementation of e-learning modules in on the job training
  - ▶ Regulatory body's
    - ▶ Relevance of defined learning outcomes
- ▶ How to proceed?
- ▶ No money : help!

# Erasmus+ project

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- ▶ Aims and objectives of the project
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# Conclusions

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- ❖ **Implementation of EU-BSS**
  - ❖ Flexibility too high
  - ❖ Guidance in development but not available yet (enetrap3)
  - ❖ Harmonization : a dream?
- ❖ **HERCA**
  - ❖ Survey RPO : most recent
  - ❖ Future task force will be necessary
- ❖ **ENETRAP 3**
  - ❖ Possible cooperation?
  - ❖ Guidance will be relevant for our e-modules
- ❖ **Belgium**
  - ❖ BVS E&T recommendations : large overlap with our e-modules
  - ❖ FANC : stakeholders meeting, positive respons to our project
- ❖ **Stakeholders involved : important for step 2**
  - Regulatory bodies
  - RPE-RPO employees and employers
  - E&T providers: academic and non-academic, private
  - Students

# Thank you for your attention!!!

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**Others :**

**radiochemistry :**

<https://wiki.uio.no/mn/safe/nukwik/index.php/NukWik>

<http://www.euchems.eu/divisions/nuclear-and-radiochemistry-2/useful-links/>

<https://nucwik.wikispaces.com/>