ENETRAP III

European Network on Education and Training in Radiological Protection

SEVENTH FRAMEWORK PROGRAMME

DE LA RECHERCHE À L'INDUSTRIE

cea

FP7/2007-2013 n° 605159

FROM COMPETENCES TO CONTENTS BY INNOVATIVE TEACHING METHODS AND TOOLS

Partners: instn, SCK•CEN ACADEMY FOR NUCLEAR SCIENCE AND TECHNOLOGY, IST-ID, Public Health England, Ciemat Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas

6TH EUTERP WORKSOP ¦ PAUL LIVOLSI, PHILIPPE MASSIOT

1ST OCTOBER 2015 - ATHENS

instn

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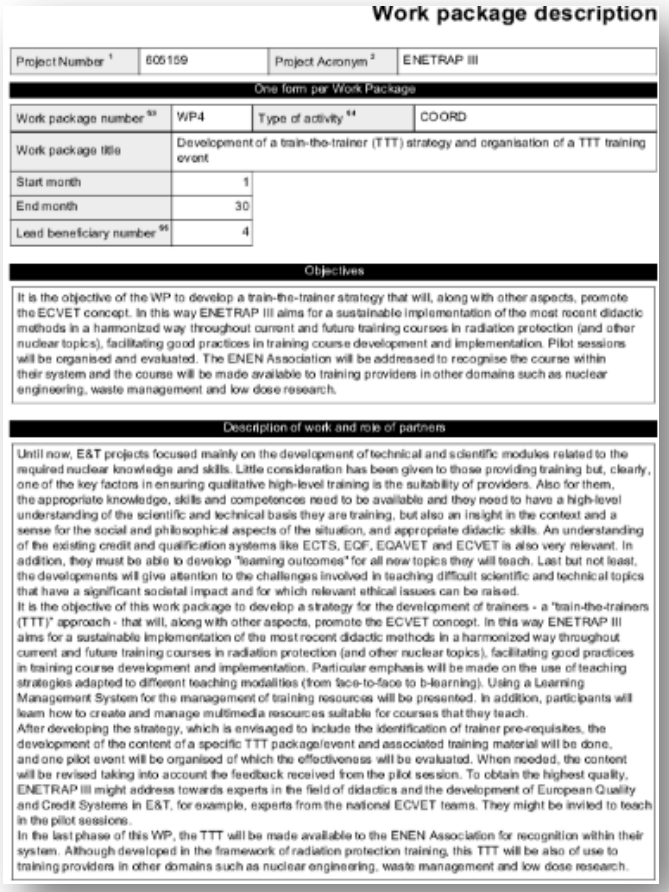
« ..not only one way to train »

- 1. Which training stategies could be implemented for RPEs/RPOs?
- 2. Development of the curriculum and course material
- 3. Organisation of a TTT pilot session

« …as many ways of training as trainers »

ENETRAP III – WP4



Work package description

Project Number [1]	605159	Project Acronym [2]	ENETRAP III
One form per Work Package			
Work package number [53]	WP4	Type of activity [54]	COORD
Work package title	Development of a train-the-trainer (TTT) strategy and organisation of a TTT training event		
Start month	1		
End month	30		
Lead beneficiary number [55]	4		

Objectives

It is the objective of the WP to develop a train-the-trainer strategy that will, along with other aspects, promote the ECVET concept. In this way ENETRAP III aims for a sustainable implementation of the most recent didactic methods in a harmonized way throughout current and future training courses in radiation protection (and other nuclear topics), facilitating good practices in training course development and implementation. Pilot sessions will be organised and evaluated. The ENEN Association will be addressed to recognise the course within their system and the course will be made available to training providers in other domains such as nuclear engineering, waste management and low dose research.

Description of work and role of partners

Until now, E&T projects focused mainly on the development of technical and scientific modules related to the required nuclear knowledge and skills. Little consideration has been given to those providing training but, clearly, one of the key factors in ensuring qualitative high-level training is the suitability of providers. Also for them, the appropriate knowledge, skills and competences need to be available and they need to have a high-level understanding of the scientific and technical basis they are training, but also an insight in the context and a sense for the social and philosophical aspects of the situation, and appropriate didactic skills. An understanding of the existing credit and qualification systems like ECTS, EQF, EQAVET and ECVET is also very relevant. In addition, they must be able to develop "learning outcomes" for all new topics they will teach. Last but not least, the developments will give attention to the challenges involved in teaching difficult scientific and technical topics that have a significant societal impact and for which relevant ethical issues can be raised.
It is the objective of this work package to develop a strategy for the development of trainers - a "train-the-trainers (TTT)" approach - that will, along with other aspects, promote the ECVET concept. In this way ENETRAP III aims for a sustainable implementation of the most recent didactic methods in a harmonized way throughout current and future training courses in radiation protection (and other nuclear topics), facilitating good practices in training course development and implementation. Particular emphasis will be made on the use of teaching strategies adapted to different teaching modalities (from face-to-face to b-learning). Using a Learning Management System for the management of training resources will be presented. In addition, participants will learn how to create and manage multimedia resources suitable for courses that they teach.
After developing the strategy, which is envisaged to include the identification of trainer pre-requisites, the development of the content of a specific TTT package/event and associated training material will be done, and one pilot event will be organised of which the effectiveness will be evaluated. When needed, the content will be revised taking into account the feedback received from the pilot session. To obtain the highest quality, ENETRAP III might address towards experts in the field of didactics and the development of European Quality and Credit Systems in E&T, for example, experts from the national ECVET teams. They might be invited to teach in the pilot sessions.
In the last phase of this WP, the TTT will be made available to the ENEN Association for recognition within their system. Although developed in the framework of radiation protection training, this TTT will be also of use to training providers in other domains such as nuclear engineering, waste management and low dose research.

WP4 DESCRIPTION

- Develop a train-the-trainer strategy that will, along with other aspects, promote the ECVET concept (1)
- In this way ENETRAP III aims for a sustainable implementation of the most recent didactic methods (2) in a harmonized way throughout current and future training courses in radiation protection (and other nuclear topics), facilitating good practices in training course (3) development and implementation.
- Pilot session will be organised (4) and evaluated (5).
- The ENEN Association will be addressed to recognise (6) the course within their system and the course will be made available to training providers in other domains (7) such as nuclear engineering, waste management and low dose research.

WHAT DO WE HAVE TO PRODUCE IN WP4?

D 4.1 DEVELOPMENT OF THE CURRICULUM AND COURSE MATERIAL

- Use the ECVET approach

D 4.2 ORGANISATION OF PILOT SESSION

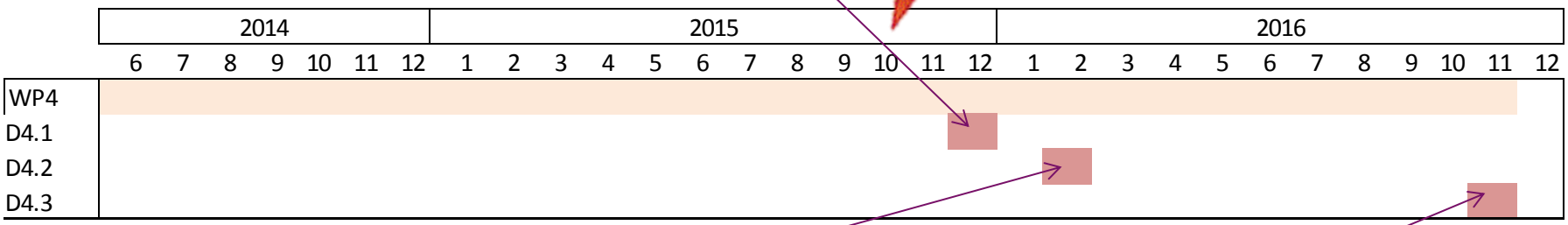
- Target audience,
- Date, place, cost, advertising…

D 4.3 EVALUATION OF THE PILOT SESSIONS AND PROPOSAL FOR POTENTIAL IMPROVEMENTS

- By whom?

SCHEDULE

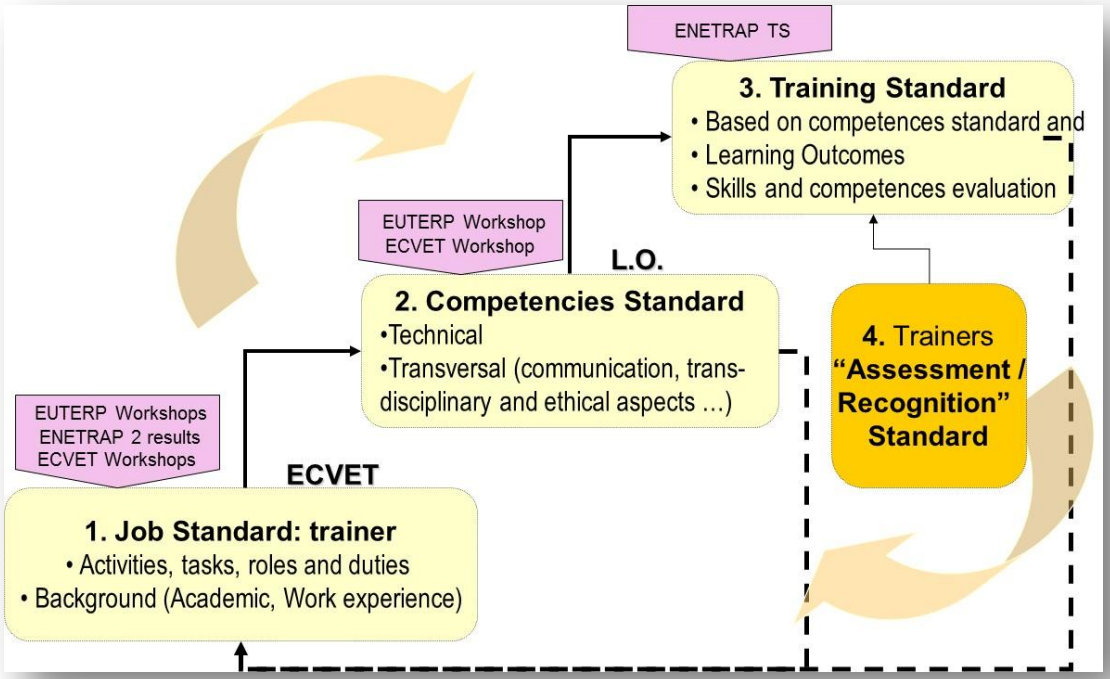
D 4.1 Development of the curriculum and course material



D 4.2 Organisation of pilot session

D 4.3 Evaluation of the pilot sessions and proposal for potential improvements

FROM COMPETENCES TO TRAINING CONTENTS



- TTT strategy taking into account trainer profile, RP domain considered, country…
- "trainer" job profile and list of competences (ECVET)
- Exercise during TTT course
- Define TTT course objectives and assessment process

1. WHICH TRAINING STATEGIES COULD BE IMPLEMENTED FOR RPES/RPOS?

SUPRA AND NATIONAL CONTEXT

- Compliance with ECVET approach,
- Supporting Learning Outcomes,

ORGANISATION AND WORKPLACE CONTEXT

- Top down or(/and) bottom up ?
- Regular or(/and) flipped approach?
- Blackboard or(/and) innovative support?
- Pedagogical or(/and) andragogical approach?

ANDRAGOGY (VS PEDAGOGY)

- **Andragogy*** consists of teaching strategies focused on adults. It is often interpreted as the process of engaging adult learners with the structure of learning experience.
- Learning process have to be adapted
- Learners need to know why they need to learn something before undertaking training
- Adults have the will to learn if the new knowledge and skills enable them to better cope with real situations
- Adults are sensitive to internal pressures that are the greatest motivation actor (desire to increase job satisfaction, self-esteem)

* The science of understanding (= theory) and supporting (= practice) lifelong and life-wide education of adults.

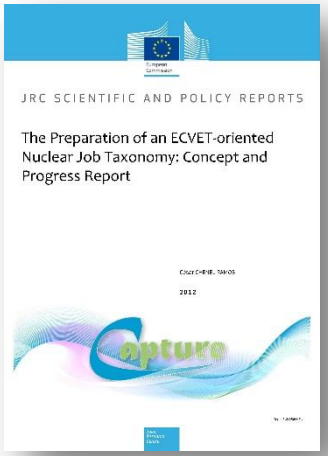
ANDRAGOGICAL VS PEDAGOGICAL APPROACH

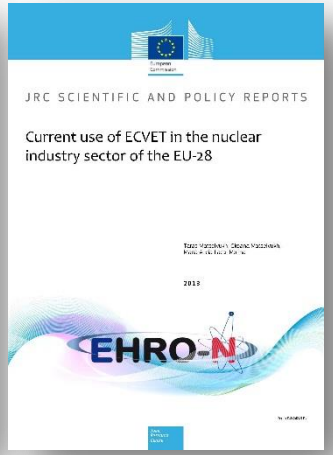
	Andragogical	Pedagogical
The Learner	The learner is self-directed The learner is responsible for his/her own learning Self-evaluation is characteristic of this approach	The learner is dependent upon the instructor for all learning The teacher/instructor assumes full responsibility for what is taught and how it is learned The teacher/instructor evaluates learning
Role of the Learner's Experience	The learner brings a greater volume and quality of experience Adults are a rich resource for one another Different experiences assure diversity in groups of adults Experience becomes the source of self-identify	The learner comes to the activity with little experience that could be tapped as a resource for learning The experience of the instructor is most influential
Readiness to Learn	Any change is likely to trigger a readiness to learn The need to know in order to perform more effectively in some aspect of one's life is important Ability to assess gaps between where one is now and where one wants and needs to be	Students are told what they have to learn in order to advance to the next level of
Orientation to Learning	Learners want to perform a task, solve a problem, live in a more satisfying way Learning must have relevance to real-life tasks Learning is organised around life/work situations rather than subject matter units	Learning is a process of acquiring prescribed subject matter Content units are sequenced according to the logic of the subject matter
Motivation for Learning	Internal motivators: self-esteem,	Primarily motivated by external pressures,

D 4.1 DEVELOPMENT OF THE CURRICULUM AND COURSE MATERIAL

DESCRIBE RPO/RPE TRAINER PROFILE

- Based on EHRO-N job profile form
  - ✓ K-S-C/A
  - ✓ Who are they?

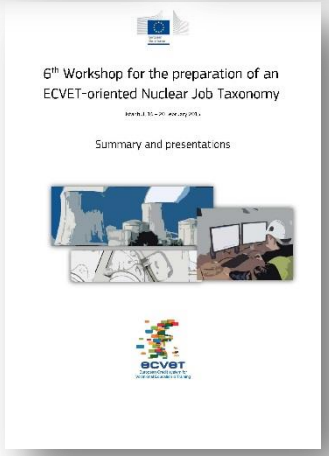




DEFINE LOS

ELABORATE LEARNING UNITS

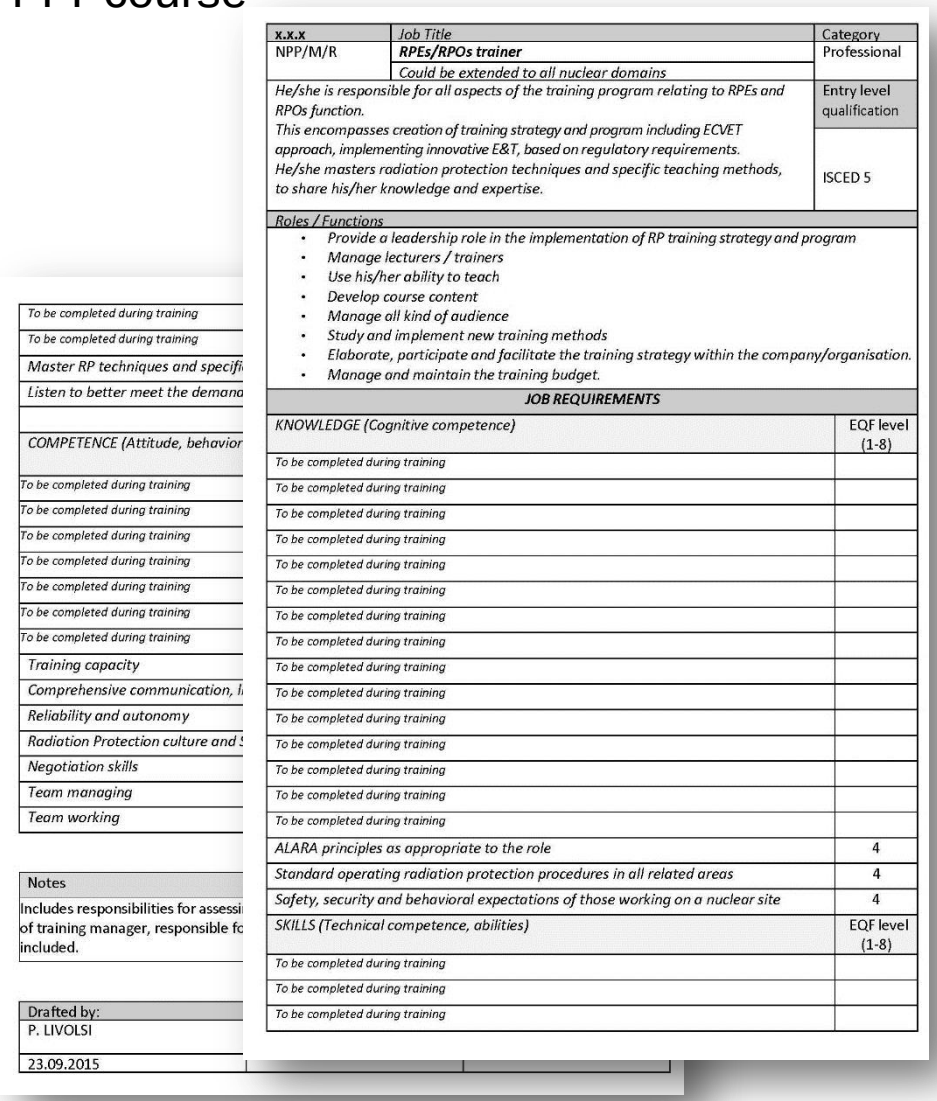
INVESTIGATE MOST RECENT DIDACTIC METHODS



IMPLEMENTE LEARNING PROCESS

JOB PROFILE DESCRIPTION FRAME BASED ON JRC EHRO-N REPORT

Used as an exercise at the beginning of TTT course



x.x.x	Job Title	Category
NPP/M/R	***RPEs/RPOs trainer***	Professional
	Could be extended to all nuclear domains	
He/she is responsible for all aspects of the training program relating to RPEs and RPOs function. This encompasses creation of training strategy and program including ECVET approach, implementing innovative E&T, based on regulatory requirements. He/she masters radiation protection techniques and specific teaching methods, to share his/her knowledge and expertise.		Entry level qualification: ISCED 5

Roles / Functions

- *Provide a leadership role in the implementation of RP training strategy and program*
- *Manage lecturers / trainers*
- *Use his/her ability to teach*
- *Develop course content*
- *Manage all kind of audience*
- *Study and implement new training methods*
- *Elaborate, participate and facilitate the training strategy within the company/organisation.*
- *Manage and maintain the training budget.*

JOB REQUIREMENTS

KNOWLEDGE (Cognitive competence)	EQF level (1-8)
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
To be completed during training	
ALARA principles as appropriate to the role	4
Standard operating radiation protection procedures in all related areas	4
Safety, security and behavioral expectations of those working on a nuclear site	4
SKILLS (Technical competence, abilities)	EQF level (1-8)
To be completed during training	
To be completed during training	
To be completed during training	

To be completed during training
To be completed during training
Master RP techniques and specifi
Listen to better meet the demand
COMPETENCE (Attitude, behavior
To be completed during training
To be completed during training
To be completed during training
To be completed during training
To be completed during training
To be completed during training
To be completed during training
Training capacity
Comprehensive communication, l
Reliability and autonomy
Radiation Protection culture and S
Negotiation skills
Team managing
Team working

Notes
Includes responsibilities for assessi of training manager, responsible fo included.

Drafted by:
P. LIVOLSI
23.09.2015

TRAINER: BEING EXPERT IN THEIR FIELD IS NOT ENOUGH.

THEY MUST STILL BE ABLE TO TRANSMIT THEIR KNOWLEDGE.

TEACHING / TRAINING SKILLS ARE AN ESSENTIAL PREREQUISITE.

THE TRAINER ORGANISES, DESIGNS AND IMPLEMENTS TRAINING: HE/SHE SETS UP A PROGRAM, METHOD AND ASSESSMENT.

D4.2 ORGANISATION OF PILOT SESSION

- Writing competences of RPE Trainer in small groups
- List the different training practices and tools used by participants.
- Writing competence + feedback + discussion
- Competences set that gives ECVET units (Learn. Unit)
- Comparison between training driven by content and training based on competences
- Development of certification and evaluation standard (later)

ENETRAP II - RPE TRAINING SCHEME

Optional modulate

8. NORM *(30 hours)*

NORM activities - Dose of workers - Dose of population - Protective measure - corrective actions

ALARA

Additional module could be organized with European ALARA Network - EAN

DOSIMETRY

Additional module could be organized with European Radiation Dosimetry Group - EURADOS

Train-the-Trainer

ECVET approach
Andragogic approach
Practical exercises et play role
Innovative tools

ENETRAP II

Add-on modulate

4. NPP Research *(30 hours)*

Reactor types – Fusion - Fuel Cycle - Dose Monitoring - Regulatory control - Safety Culture - Accidental situations - Criticality

5. Waste, Dec. *(30 hours)*

Waste Management - Decommissioning - Ventilation, filtration -Transport

6. No nuclear *(30 hours)*

Irradiators / generators - Accelerators / Gauges - Industrial Radiography - Unsealed sources - Accidental situations

7. Medical *(30 hours)*

Equipment - Occupational Radiation Protection- Classification of areas- Accidental situations

Common Basis

1. BASIC *(35 hours)*

Radioactivity - Interactions - Quantities and Units - Basic biology & Bio. Effects - Physical principles of detection - Applications of Ionis. Radiation (overview)

2. Foundation *(50 hours)*

RP and External Dosi.- Prot. against external - Prot. against internal - Dose monitoring - Regulatory Framework - Natural sources - Public / Environmental - Ethical considerations

3. Occupational *(30 hours)*

Transport - Design issues - Accidents & Emergency issues - Safety Culture – ALARA - Decommissioning Principles - Waste Management principles

ENETRAP II

PROGRAMME: 1 WEEK COURSE (DRAFT)

	Monday 15th Feb. 2016	Tuesday 15th Feb. 2016	Wednesday 15th Feb. 2016	Thursday 15th Feb. 2016	Friday 15th Feb. 2016
09:00	Introduction to TTT course	Teaching techniques: from lecture to case studies	Software for dose calculation: how to create exercices?	To be completed (Detection practical work e.g.)	Preparation work before training action with RP audience
	Presentation of course objectives and program	Introduction to innovative tools			
10:00	Tour de table	How to enhance learner participation?			Training action with RP audience: - several workshops and groups of learners
11:00	ECVET system: how to implement it	Simulation tools	Augmented virtual reality in medical sector: VERT presentation		
12:00	*Lunch*	*Lunch*	*Lunch*	*Lunch*	*Lunch*
13:00					
	ECVET and RP job profiles	NPP work-school workshop	DOSEO workshop: medical sector	Preparation work before training action in front of RP audience	Training action with RP audience: - several workshops and groups of learners
14:00	Workshop: From job profiles to learning outcomes				
15:00	ECVET: from Learning outcomes to E&T content				Conclusion and debreifing of ENETRAP TTT course
16:00	Discussion on ECVET implementation				

Practice

Practice

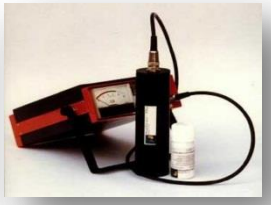
Practice

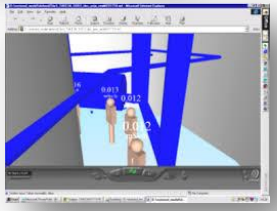
Practice

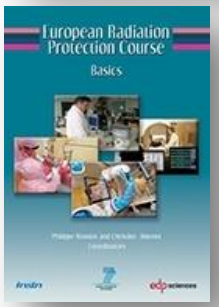
Practice

Practice

PROPOSAL OF TTT TRAINING ACTIVITIES


RP TRAINING TOOLS: *(draft)*

ENETRAP II

- Simulation tools
- Software to support ALARA implementation
- Workshops: NPP and medical

TRAINING TOOLS:

- Metaplan®, SWOT, Text book…
- Augmented reality and voting system (real-time feedback to involve audience)

CONCLUSION

SAVE THE DATE!!

15th to 19th February, INSTN Saclay

ENETRAP II

- **20** km from PARIS
- **1**st ENETRAP TTT course
- **1** week course
- **500** € as fees
- **1** opportunity to visit RP E&T installations
- **30** minutes of lecturing / training for
- **16** students from EMRP as audience
- **1** unique chance to share RP training experience within participants and ENETRAP partners
- **25** cL **of French wine** / lunch !!

Thank you for your attention!!

paul.livolsi@cea.fr
philippe.massiot@cea.fr

Atomic Energy and Alternative Energies Commission
Center of Grenoble ¦ 38054 Grenoble
T. 33 (0) ' 38 78 39 27 ¦ F. 33 (0) 4 38 78 51 01
Industrial and commercial public undertaking ¦ RCS Paris B 775 685 019

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