EUROPEAN TRAINING AND EDUCATION IN RADIATION PROTECTION FOUNDATION

BOOK OF ABSTRACTS

EUTERP Workshop
Radiation protection training in Europe – the next steps

March 28-30, 2011
Ayia Napa, Cyprus

Westerduinweg 3
1755 LE Petten
The Netherlands
www.euterp.eu

SCK•CEN-BA-37

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Organising committee

1 Programme

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Stelios Christofides, EFOMP, Cyprus
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Introduction

Welcome to the 4th Workshop of EUTERP, the first one in the new EUTERP organisation structure. Started as a European project in the summer of 2010 the EUTERP Platform became a legal entity, the EUTERP Foundation. The objectives of the Foundation are:

1. promoting the mobility of professionals among EUTERP countries;
2. facilitating the attendance of international radiation protection training courses in EUTERP countries;
3. and the performing of all acts related or conducive to the foregoing.

The Foundation facilitates a permanent dialogue between all involved parties by the use of its website (www.euterp.eu), issuing newsletters, and organizing workshops. In the communication and information exchange of the network the National Contact Point plays an important role.

Important changes in coming European legislation regarding radiation protection (RP) professional are based on the recommendations made in the 2nd EUTERP Workshop. In the draft of the revision of the Euratom BSS the currently defined Qualified Expert (QE) will be replaced by Radiation Protection Experts (RPEs) and in addition Radiation Protection Officers (RPOs) are introduced. These concepts might have profound consequences in the implementation stage in the Member States.

In the 1st and 2nd Workshop the main topic was related to the implementation of the concept of the QE from the Euratom 1996 Directive. The problems faced by the Member States were translated into a number of recommendations, including a change in nomenclature and definition. The 3rd Workshop focussed on the way to move forward.
In this 4th Workshop we will address the difficulties implementing RPE and RPO in the legislation, but also the advantages of these concepts. Education and Training can be based on more uniform learning objectives and quality parameters might then be easier assessable. Recognition of RP professionals, and therefore mobility between Member States, will benefit from these developments.

EUTERP aims at being a European body on harmonisation of criteria and qualifications for mutual recognition of Radiation Protection professionals. Your contributions in general and your participation of the Workshop in particular help the education and training of RPEs and RPOs and will contribute to the implementation process of these functions in Member State legislation.

I wish you a fruitful and inspiring Workshop.

Folkert Draaisma
EUTERP President

Programme

Sunday March 27
18.30 h - Welcome cocktail

Monday March 28		
Session 1	Plenary	Chairman: Folkert Draaisma
09.00 – 09.15	Welcome and introduction	Folkert Draaisma EUTERP President
09.15 – 09.45	Education and training in radiation protection in the draft of the revised Euratom Basic Safety Standards	Georgi Simeonov EC DG Energy
09.45 – 10.15	About the ECVET system: definitions and implementation	Folkert Draaisma on behalf of Isabelle Le Mouillour
10.15 – 10.45	*Break*	
Session 2	EFOMP experiences	Chairmen: Stelios Christofides Penelope Allisy-Roberts
10.45 – 11.00	EFOMP and its involvement in European projects	Stelios Christofides
11.00 – 11.15	The EU MPE project	Stelios Christofides on behalf of Wil van der Putten
11.15 – 11.30	The RPE of first choice in the medical area - why it is the MPE	Renato Padovani
11.30 – 12.00	The EU MPE project: qualification and curriculum frameworks for the MPE in Europe	Carmel J. Caruana
12.00 – 12.30	Discussion	
12.30 – 14.00	*Lunch*	

Session 3	7FP ENETRAP II activities and results	Chairman: Michèle Coeck
14.00 – 14.20	ENETRAP II: development of European reference training schemes for RPE's and RPO's	Michèle Coeck
14.20 – 14.50	Requirements for RPE and methodology for mutual recognition	Joanne Stewart
14.50 – 15.20	The reference standards for RPE training	Paul Livolsi
15.20 – 15.40	Organization of the RPE reference training scheme	Siegurd Möbius
15.40 – 16.00	*Break*	
16.00 – 16.30	Requirements and guidance for European RPO training	Annemarie Schmitt-Hannig
16.30 – 17.00	Methodology and quality assurance protocol for comparison and evaluation of training material, training providers and training events, based on ECVET approach	Folkert Draaisma
17.00 – 17.30	Creation and use of the ENETRAP II database for training events and providers	Marisa Marco
17.30 – 17.45	Accompanying text-book and cyber-book for the RPE training scheme of ENETRAP II: intermediate results	Paul Livolsi
17.45 – 18.00	Questions and closure	

Tuesday March 29		
Session 4	Recognition arrangements	Chairman: Marcel Schouwenburg
9.00 – 9.25	Qualified experts for radioactive waste management – the UK approach	Richard Paynter
9.25 – 9.50	Comparing radiation protection courses in Germany and The Netherlands – a bilateral project	Hielke Freerk Boersma
9.50 – 10.15	Harmonisation and mutual recognition of qualification in radiation protection in nuclear facilities in Switzerland and Germany	Swen-Gunnar Jahn
10.15 – 10.30	*Break*	
10.30 – 12.00	Discussion in working groups 1. With respect to E&T for RPE and RPO, what is the impact at national level of the introduction of the revised BSS? Will changes have to be introduced in the legislation and are problems to be foreseen? 2. Methodology and quality assurance protocol for comparison and evaluation of training material, training providers and training events. How can the ECVET system and approach be introduced? 3. What training and staffing shortfalls in radiation professions are foreseen and in which sector?	
12.00 – 12.30	Discussion on first working group outcomes	
12.30 – 14.00	*Lunch*	
Session 5	Implementation of legislative requirements on training	Chairman: Richard Paynter
14.00 – 14.20	The new BSS definitions of the radiation protection professions and their effect on the Greek legislation	Ioannis Kantemiris
14.20 – 14.40	The role of regulatory authority on radiation protection training in Lithuania	Jurate Vaicekaviciute
14.40 – 15.00	Systematic approach to training	Matjaz Kozelj
Session 6	Attracting a new generation	
15.00 – 15.20	Overview of the RP action plan – the ENETRAP II tool to enthuse the young generation with RP	Mihail Ceclan
15.20 – 15.30	*Break*	
15.30 – 18.00	Discussion in working groups - continued	

Wednesday March 30		
Session 7	Conclusions and look ahead	Chairman: Richard Paynter
09.00 – 10.00	Reporting of 3 working groups outcome	Working groups rapporteurs
10.00 – 11.00	EUTERP action plan 2011-2012 + discussion	Folkert Draaisma
11.00 – 11.15	*Break*	
11.15 – 12.15	Workshop summary and conclusions	Richard Paynter Folkert Draaisma
12.15 – 14.00	*Lunch*	

7FP TRASNUSAFE - Reflection group

About the link between radiation protection and safety culture and its implementation in training courses on safety culture for managers of nuclear installations

Oral presentations

Education and training in radiation protection in the draft of the revised Euratom Basic Safety Standards

G. Simeonov, S. Mundigl
European Commission, Directorate-General for Energy, Luxembourg

The treaty establishing the European Atomic Energy Community (Euratom) was signed in 1957. The first Euratom Basic Safety Standards (BSS) Directive was consequently adopted in 1959. The BSS Directive was revised several times, the current version being Council Directive 96/29/Euratom from 1996. Since then the BSS Directive was supplemented with other legal acts covering specific aspects of radiation protection.

A revision of the 96/29/Euratom Directive and the related legislation was undertaken in the recent years with the objective to address the latest scientific knowledge and operational experience and to simplify the legal text by consolidating the relevant pieces of legislation into one Directive; a harmonization with the International Basic Safety Standards was also sought.

The revision of Euratom BSS Directive proposes important changes with regard to the roles and responsibilities of services and experts involved in ensuring the radiation protection of the public, workers and patients. The draft revised BSS defines the role of the Radiation Protection Expert (replacing the current Qualified Expert) and of the Medical Physics Expert and introduces the function of a Radiation Protection Officer.

In the draft BSS the requirements for training, education and information are strengthened and addressed in a specific title in order to highlight their importance. There is now an explicit requirement to the Member States to ensure the establishment of adequate legislative and administrative framework for education and training especially with regard to services and experts requiring recognition by the state. Bigger emphasis is put on continuous/repeated training and on feedback from operational experience. In the medical area this is coupled with new requirements for informing patients, recording patient doses, and recording, reporting and follow-up of accidental
and unintended exposures.

The revised Euratom BSS[1] is currently undergoing the procedures of becoming an official European Commission's proposal, expected to be finalized in mid 2011. The proposal will then go through the European Union's decision-making procedures with the view of being finally adopted in 2011-2012.

[1] available at
http://ec.europa.eu/energy/nuclear/radiation_protection/doc/art31/2010_02_24_draft_euratom_basic

About the ECVET system: definitions and implementation

NN
EC DG Education

EFOMP and its involvement in European projects

S. Christofides
Nicosia General Hospital, Nicosia, Cyprus

One of the main aims of the European Federation of Organisations for Medical Physics is to propose guidelines for education, training and accreditation programmes. In the past this was achieved through the publication of Policy Statements and the organisation of education and training courses, seminars and conferences. This represents a long-term work-programme aimed at harmonising the education and training of the Medical Physicist across Europe. More recently EFOMP become involved in a number of European and International projects that aim in developing education and training recommendations not only for Medical Physicists but also for other Medical Radiation Professionals.

This presentation will give an overview of the EFOMP involvement in these projects.

The RPE of first choice in the medical area - why it is the MPE

R. Padovani
University Hospital, Udine, Italy

The aims of the European Federation of Organisations for Medical Physics (EFOMP), listed in its constitution, include:

1. fostering and coordinating the activities of National Member Organisations in the field of Medical Physics and collaborating where appropriate with national and international organisations;
2. making recommendations on the appropriate general responsibilities, organisational relationships and roles of workers in the field of Medical Physics;
3. liaising with the European Union on professional, scientific and training matters.

Since the implementation of the Medical Exposure Directive (MED), some Member states and many hospitals in Europe ask their Medical Physics Experts (MPEs) to assume also the role of Radiation Protection Expert (RPE) or the Qualified Expert, as defined in Directive 96/29/Euratom. This choice is of particular importance for the optimization of occupational exposure in those situations when staff doses are intrinsically linked to patient exposures, such as interventional radiology. In smaller hospitals for economic and practical reasons this is the norm as employing separate MPE and RPE is considered unrealistic.

Taking into account this situation, EFOMP in 2006 developed and approved a statement called the “Malaga Declaration” that states that: *“The Medical Physics Expert (MPE) as defined in the Directive 43/97 must be the professional to supervise and assume the responsibilities of the Radiation Protection activities in Hospitals, including patients, working staff, members of the public and visitors to the Hospitals”.*

Since 2006 EFOMP has insisted on the implementation of the Malaga Declaration in its dealings with national and international bodies concerned with radiation protection, such as national nuclear regulatory bodies, EU, IAEA and WHO.

Because a proper implementation of the Malaga Declaration requires an effort to harmonise education and training of MPEs throughout Europespecific guidelines have been approved or are under development in collaboration with relevant European scientific organizations (EAR, EANM and ESTRO), that include curricula for staff protection, dosimetry and exposure optimization. Another action in this direction is the week course on radiation protection offered at the ESI/EFOMP Annual School of Medical Physics (Archamps, France) since 2008 which also involves the radiation protection of workers and the general public.

For all these reasons EFOMP is supporting the principle that the RPE of first choice in the medical sector should be the MPE.

The EFOMP/European Union Project on Medical Physics Expert project

W. van der Putten
University Hospital Galway, Ireland and EFOMP

European Commission Directive EU/97/43/Euratom (MED) outlines measures to protect patients from the effects of ionising radiation. The directive mentions the “Medical Physics Expert’ (MPE) as a profession critical to the provision of such radiation protection processes. Since the inception of the Directive there has never been a European-wide and unambiguously clear definition of the MPE.

As part of the current revision of directives on radiation protection (including 97/43/Euratom) the European Commission issued a request for tender to finally arrive at a definition of MPE (Tender TREN/H4/167-2009). The main objective of this are to provide for improved implementation of the Medical Exposures Directive (MED) provisions related to Medical Physics Expert (MPE) and to facilitate the harmonization of the MPE among the Member States. Thus, the project will also support the European Commission (EC) in its’ activities relating to the optimisation of radiation protection of individuals submitted to medical exposures. The tender was awarded to a consortium (including EFOMP) and managed by the University of Complutense (Madrid)

The main aim of the project is to:

- issue a widely accepted document at European level that eventually could be considered - partially or as a whole - as a European Guideline on the professional competences for MPE and the minimum requirements to be acknowledged as MPE according to MED;
- make recommendations for the most appropriate education and training structure, based on the European High Education Area, to achieve the defined and required professional competences. This in turn will facilitate European wide recognition and mobility of Medical Physicists;
- proposal for detailed "standard" syllabus for the education and training of MPEs;
- update criteria for staffing levels in Medical Physics Departments depending on the complexity and equipment of Radiological Services.

The project is divided into a number of different workpackages. The critical ones are :

1. A European Union wide survey amongst medical physicists on what defines a Medical Physics Expert;
2-4. Syllabus for the education and training of MPEs in Diagnostic radiology, Nuclear medicine and Radiotherapy;
5. Criteria for the staffing levels in Medical Physics Department.. This is augmented by a survey of current staffing levels in Europe;
6. Development of guidelines on the role, responsibilities, competences, qualifications, training and selection criteria for MPEs in Europe.

The final report of the tender is due in September 2011. Preliminary results and conclusions will be discussed at a Workshop which will be held in Seville, Spain on 9 -10 May 2011.

Further information can be found at : http://portal.ucm.es/web/medical-physics-expert-project

The EU MPE project: qualification and curriculum frameworks for the MPE in Europe

C. J. Caruana
EFOMP, Malta

The objectives of EC project `Guidelines on Medical Physics Expert´ are to provide for improved implementation of the provisions relating to the Medical Physics Expert (MPE) within Council Directive 97/43/EURATOM and the proposed recast Basic Safety Standards directive. This includes harmonisation of the mission statement for Medical Physics Services as well as the Education and Training of the MPE. It also includes detailed knowledge-skills-competence inventories for the Medical Physics Expert in each of Diagnostic and Interventional Radiology, Nuclear Medicine and Radiotherapy. We present the proposed Qualification and Curriculum Frameworks.

The principles guiding the development of the Qualification and Curriculum frameworks were the following:

1. The proposed qualification framework should be based on the levels defined by the European Qualifications Framework (EQF) for lifelong learning which is the most recent document proposed by the EC for qualification frameworks.
2. The qualification framework would facilitate the mobility of the MPE in Europe through an agreed set of minimum criteria for achievement of MPE status.
3. The qualification framework would make it possible for more individuals to achieve MPE status through its flexibility, cost-effectiveness and lifelong learning approach.
4. The determination of curriculum content will be guided by an updated mission statement for Medical Physics Services derived from the Council Directive 97/43/EURATOM and recast BSS.

ENETRAP II: development of European reference training schemes for RPE's and RPO's

M. Coeck on behalf of the ENETRAP II Consortium
Belgian Nuclear Research Centre (SCK•CEN), Mol, Belgium

Radiation protection (RP) is a major issue in the industrial applications of ionising radiation, both nuclear and non-nuclear, as well as in other areas such as the medical and research area. As is the case with all nuclear expertise, there is a trend of a decreasing number of experts in RP due to various reasons. On the other hand, current activities in the nuclear domain are expanding: the nuclear industry faces a so-called "renaissance", high-tech medical examinations based on ionising radiation are increasingly used, and research and non-nuclear industry also make use of a vast number of applications of radioactivity.

Today's challenge involves measures to make the work in RP more attractive for young people and to provide attractive career opportunities, and to support young students and professionals in their need to gain and maintain high-level RP knowledge and skills.

The ENETRAP II project aims at meeting this challenge, through the development and implementation of a high-quality European standard for initial education and continuous professional development for Radiation Protection Experts (RPEs) and Radiation Protection Officers (RPOs), and a methodology for mutual recognition of these professionals on the basis of available EU instruments. It is envisaged that the outcome of this project will be instrumental for the cooperation between regulators, training providers and customers (nuclear industry, medical sector, research and non-nuclear industry) in reaching harmonization of the requirements for, and the education and training of RPEs and RPOs within Europe, and will stimulate building competence and career development in RP to meet the demands of the future. Another goal of the project is the introduction of a European RP training passport.

Requirements and methodology for recognition of the RPE

J. Stewart[1], E. Fantuzzi[2], H Van Elsäcker-Degenaar[3], P. Livolsi[4], A. Schmitt-Hannig[5]
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[5]Federal Office for Radiation Protection (BfS), Neuherberg-Oberschleissheim, Germany

The primary focus of the wider ENETRAP II project is the development of European reference standards for education and training in radiation protection. However, there are a number of subsidiary objectives within the project relating to issues associated with mutual recognition between Member States of, not only education and training, but also any status conferred (in part) by that training - specifically the status of Radiation Protection Expert (RPE).

The requirements for formal recognition of RPEs and the development of methodologies for both national and mutual recognition has being addressed within Work Package 2 of ENETRAP II. The specific objectives of the work programme were:

- to define the requirements for national and mutual recognition of RPEs within EU Member States;
- to provide guidance with respect to national schemes for recognition of RPEs;
- to develop a mechanism for the mutual recognition of RPEs between Member States.

Throughout the work it was important to bear in mind the final objective relating to “mutual recognition”. If an effective mechanism for mutual recognition is to be achieved then there must be a good degree of commonality with respect to the key elements of, and criteria applied to, the various national schemes. It was also important to respect the fact that the majority of EU Member States have well established radiation protection infrastructures and any models or mechanisms for recognition should reasonably be expected to fit into those existing infrastructures. An initial overarching objective, therefore, was to work towards an outline model for national recognition schemes which, if adopted by Member States would not only:

- ensure sufficient flexibility for Member States to establish systems for RPE recognition that can be readily accommodated within national infrastructures, but also
- ensure a degree of commonality sufficient to facilitate mutual recognition of RPE status between Member States.

This presentation describes the outcome of the work package and presents the proposals for recognition of RPEs on both a national basis and between Member States.

The reference standards for RPE training

P. Livolsi[1], P. Massiot[1], M. Coeck[2], A. Schmitt-Hannig[3], E. Fantuzzi[4],
M. Marco-Arboli[5] , J. Stewart[6], P. Vaz[7], M. Ceclan[8]
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The main goal of the Work Package 4 of ENETRAP II project is to establish the reference standards for RPE training. The process to create the RPEs' training scheme is based on a step-approach with initially 3 standards. These standards are studied in ENETRAP II work packages. The first standard is “RPEs' job standard”, the second one is the “RPEs' competencies standard” and the third one is the “RPEs' training standard”. A new step has to be taken into account in a context of mutual recognition process: the RPEs' “certification standard”. For the REPs’ training standard, a modular approach has been selected, reflecting the transdisciplinary aspects of Radiation Protection. Toward all RP fields, RPE must have developed and validated qualification directly useful for the accomplishing of his/her job. This qualification is defined in terms of knowledge, skills and competences that can be assessed and validated.

The will to use the ECVET[2] approach, a new European instrument to support lifelong learning, drove the reflection toward the writing of Learning Objectives for each module by using Bloom taxonomy. These Learning Outcomes are statements of what a learner knows, understands and is able to do on completion of a learning process.
A basis knowledge called "common basis" has been established. In complement of this common grounding, different modules are proposed. Each module is self-standing and a final summative evaluation is introduced at the end, taking the form of multiple choice questions, exercises or problems to solve.

In addition to “common basis”, a RPE applicant has to choose at least one optional module among: Nuclear Power Plants and research reactors, waste management and decommissioning, research and non-nuclear areas, medical, naturally occurring radioactive materials (NORM). Depending on module, an additional period called “OJT[3]” is proposed to the RPE trainee in order to work at a suitable environment.

[2] European Credit System for Vocational Education and Training
[3] On the Job Training period

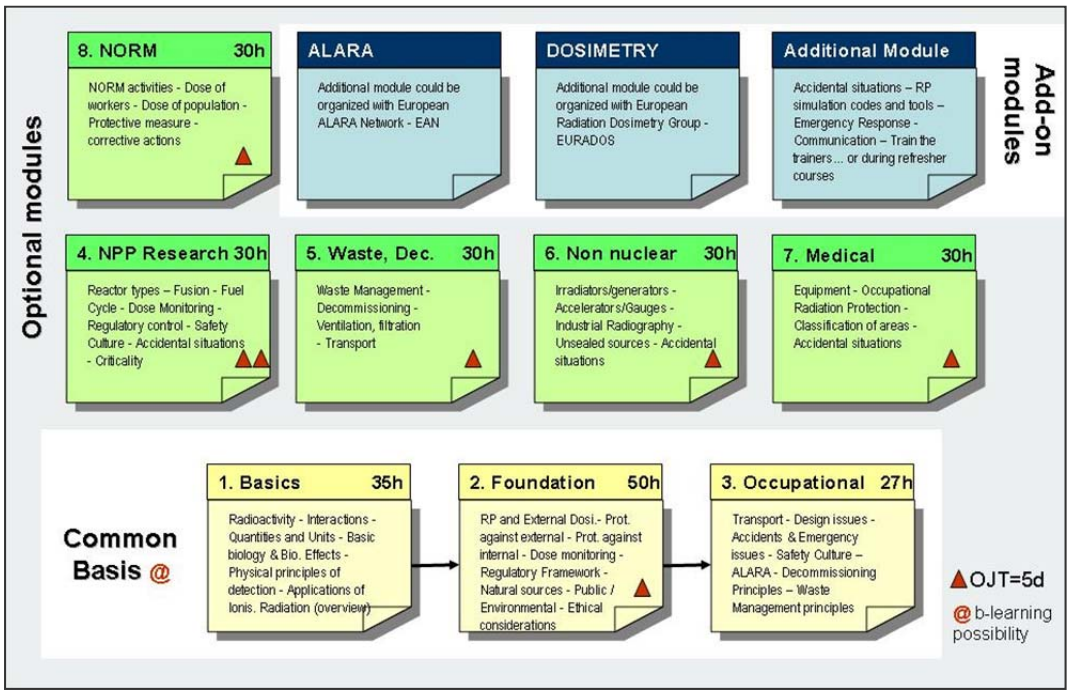

Figure 1: ENETRAP-II RPE training scheme

Organisation of the RPE reference training scheme

S. Möbius[1], B. Breustedt[2], P. Livolsi[3], F. Draaisma[4], M. Marco[5], J. Stewart[6], P. De Regge[7], P. Vaz[8], P. Zagyvai[9], M. Coeck[10]
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The overall objective of ENETRAP II, which is one of the EC's 7th Framework Programme projects, is to develop European high-quality "reference standards" and good practices for training in radiation protection (RP). One major goal is to monitor the effectiveness of the proposed methodologies by organizing pilot sessions of selected training courses. The modular courses in the first phase are designed for radiation protection experts (RPE), in accordance with the new European BSS (basic safety standards). They include the "Common Basis" (Module 1 to 3) and a series of specialized "Optional Modules" on occupational radiation protection at different installations where ionizing radiation is applied.

These are
Module 1: **Basics,** 14-18/03/2011
Module 2: **Foundation,** 21-25/03/2011
Module 3: **Occupational RP,** 28-30/03/2011
Module 6: **Unsealed Sources, Research and Non-Nuclear,** 30/03-01/04/2011
Module 8: **NORM**, 23/05-26/05/2011 (NRG, Petten, the Netherlands)

Modules 1 to 3 and 6 will take place at KIT, Karlsruhe (Karlsruhe Institute of Technology) in English language. The participation in the whole block fulfils all training requirements of European RPEs for unsealed sources in non-nuclear industry and research. Special features of the courses are hands-on involvement of participants through practically-oriented laboratory exercises and technical visits.

Experiences from the selection and preparation of the pilot training events including their acquisition are summarized. Preliminary results from the first two training weeks in Karlsruhe will be reported and results from the discussions on the effectiveness of the proposed training standards shown. A life interview with the participants originating from 7 different EC countries is foreseen.

Requirements and guidance for European RPO training

A. Schmitt-Hannig[1], J. Stewart[2], M. Coeck[3], S. Möbius[4], P. Vaz[5], M. Marco[6], G. Gualdrini[7], F. Draaisma[8]
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Employees, appointed to act as radiation protection officers (RPO) in hospitals, industrial companies or teaching and research institutions should have an adequate level of understanding of concepts related to radiation protection and understand the radiation protection issues pertinent to their radiation application. Therefore, the level and format of training required by an RPO is dependant on the complexity of that application. It is essential, on the European level, to define requirements for the competencies of RPO according to their area of work and specific radiation protection tasks, and to establish European reference standards for RPO training.

This presentation describes type, content and minimum duration of RPO training for a number of applications in medicine, industry and research as well as the minimum work experience depending on the complexity of the application and activity and type of the sources used. The proposed training schemes and the corresponding work experience serve as input for establishing European reference standards for the necessary level of knowledge, understanding and competence of RPO.

Methodology and quality assurance protocol for comparison and evaluation of training material, training providers and training events, based on ECVET approach

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To maintain a high level of competency in Europe regarding radiation protection and to facilitate harmonisation and (mutual) recognition of Radiation Protection Experts (RPEs) and Officers (RPOs) quality assurance and quality control might play an important role. The ENETRAPII project (FP7-EURATOM) aims at developing European high-quality 'reference standards' and good practices for education and training in radiation protection. In work package 5 (WP5) the quality issue is addressed. Therefore WP5 deals with the development and application of mechanisms for the evaluation of training material, training events and training providers by means of a transparent and objective methodology. The results can be used by regulatory authorities to benchmark their national radiation protection training programme and will be communicated to other networks, e.g. EUTERP.

The presentation is about two key tasks in WP 5.
The first key task is the development of a comparison method to compare existing training material with existing standards. WP5 has been started with an inventory of topics, items and subjects that need to be addressed in the education and training of the RPE and RPOs.
The inventory has started with the subjects addressed in the syllabus EG133 (EG Basic Syllabus 98/C133/03), the IAEA syllabus (IAEA Basic Syllabus PGEC), the European Master's degree in Radiation Protection syllabus – EMRP - (result of WP8 ENETRAP), the existing tables of subjects for education and training in radiation protection and similar tables used in different countries.
At the conference a presentation is given about the comparison of an existing training book with EG133, which led to the concept of the first comparison table.

The presentation will secondly address the development of a quality assurance protocol that is another key item in WP5 of ENETRAP2. For the comparison of training providers an inventory will be carried out about the elements of quality assurance. This inventory will take into account requirements by regulations and international standards, e.g. ISO 17024 and topics addressed by stakeholders. A first concept of the elements of quality assurance will be presented at the conference.

Creation and use of the ENETRAP-II database for training events and providers

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The objective of the WP6, inside the 7FP project ENETRAP II, is the creation of a data base (DB) to collect the main education and training (E&T) events in radiation protection (RP) in Europe as well as the information about the E&T providers, including its possibility of On-the-Job-Training (OJT).

The DB will be the instrument of support of the project to indicate the degree of conformity with the standards developed by WP5 for the RPE and RPO E&T events.
The equator of the project has been crossed and until this moment has been analyzed the kind of E&T events to be included in the DB beginning with the documents:" The Daft EURATOM Basic Safety Standards Directive" and " The IAEA Requirements for the training of RPOs". From this analysis, the necessities, the DB must be satisfied, have been identified.
Other DBs with similar purposes have been studied in detail. Among this, the most important one is the ENEN DB, proposed to harbour all the information subject to the ENETRAP II DB, if the necessary changes on it could have been done without change the structure of the existing one.

It has been envisaged to create a system of management and query of E&T events in RP and its providers composed by three modules that will be described in detail in the communication. The three modules are:

1. **Database module**, focused to store the information related to the E&T providers, and E&T events.
2. **Maintenance module**, which allows the authorized people to update the information of the national contact points (NCP), the E&T providers and the E&T events. This module must allow, in an agile and safety way, the effective maintaining of the information with the aim of being permanent actualized. This module must be capable of generating the needed notifications required by the different actors to be informed of the actualized data of their self interest.
3. **Web search module**, that allows to the users looking for the demanded information (E&T events and E&T providers) through different criteria. One key point that can be developed is a monthly "newsletter" to be sent to the interested user of the DB with all the upcoming E&T events.

The main idea, this three-modules-system tries to reach, is to develop a self-supporting system, actualized directly by the producers of the information (E&T providers) but maintaining the high level of quality required by the project. The estimated duration of the elaboration is 5 or 6 months.

In a first phase, the NCPs will be the ENETRAP II members, and the first providers to be included will be the same. In a second phase, the number of E&T providers will be incremented with all of those interested providers that satisfy the requirements established by WP5.
In this communication all the technical details of the proposed DB for the working package (WP) 6 for the ENETRAP II aims will be described.

Accompanying text-book and cyber-book for the RPE training scheme of ENETRAP-II: intermediate results

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To create an accompanying text for the RPE training schemes in the framework of ENETRAP II (European Network on Education and Training in RAdiological Protection II), we first needed to identify different text books already existing in the Radiation Protection field. A lot of texts already exist in different EU countries and thus in different languages. First, we identified the resources provided by project members.
With these criteria, a data base was set up, listing relevant text books. 66 entries were found. The main characteristics were: theory; exercises; auto evaluation and others: authors; date; editor; ISBN; target audience; utilization; key-words; field; origin. Then, we only selected text books corresponding to the ENETRAP II training scheme, according to the table of contents.

After a detailed analysis, we identified the text book which could be used as reference for the creation of the WP7 text book : « Principes de radioprotection-réglementation » Jimonet and Métivier 2009. We have chosen this book for its diversity of activities based on exercises with corrections, frames named “to learn more” and its embedded highly pedagogical approach.
After this choice, it was necessary to compare the content of this book with module 1 of common basis of ENETRAP II training scheme requirements. The work involves the structuring of this text according to the training scheme and its translation into English. To have complete resources which correspond to the European Radiation Protection Training Scheme (ERPTS), the contents not dealt with in the text-book, will be integrated in the complementary cyber book.
Concerning the development of new learning tools, the work that we do is not separate from the previous ENETRAP WP5. We took into account the results of its works. The ENETRAP WP 5 “new concepts and tools for a European Radiation Protection Course (ERPC)”, had to assess new training tools (distance learning). For this purpose, a study was conducted on e-learning and b-learning methodologies and resources.

The work achieved is connected with the ENETRAP WP5 results. After assessment of several Learning Management Systems, the Moodle platform was selected.
In order to insert complementary pedagogical resources in the cyber-book, specific ENETRAP II web pages have been created (http://tinyurl.com/enetrapII).
An assessment of Rich media resources using sonorised (audio plus video) PowerPoint files was performed.
This kind of resources could be one of the missing components of a comprehensive capability to enrich the learning process of RPEs. It is the reason why we are going to set up lecture capture during the pilot course, which will be held in Karlsruhe in March 2011. By the end of the project, we will write exercises and their corrections, integrating the technology of sonorised PowerPoint files.
One of the missing components of the cyber-book is a forum where RPEs and RPOs can ask and exchange information. Work is in progress in order to use the French feedback of for such an approach.

Qualified Experts for radioactive waste management – the UK approach

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Implementation of the Basic Safety Standards (96/29/EURATOM) in the UK has been achieved by the use of separate legislation for personnel safety and environmental protection, most of which originated 60 years ago. For personnel protection in the workplace the Qualified Expert role is fulfilled by the Radiation Protection Adviser (RPA). This role has been defined and in operation for many years with enforcement by the Health and Safety Executive.

The environmental regulators have required employers to use a specialist adviser on radioactive waste management for several years but it is only recently that the UK has defined the role of the Radioactive Waste Adviser (RWA) following a formal consultation in 2010 by the Regulatory Bodies (the environment agencies for England and Wales, Scotland and Northern Ireland). The foundation of the proposals (to be started in 2011) is a syllabus of relevant knowledge and a scheme defining appropriate levels of experience that together describe the level of competence expected of the Radioactive Waste Adviser. The development of the syllabus has been led by the regulators but with the UK Radiation Protection profession working with them. In addition, the regulatory bodies have proposed an implementation scheme that will largely be run by the profession, with a light touch from the regulators. An independent body will certify the competence of all RWAs but the employer will still have to decide if any individual is suitable for their own circumstances. Appropriate credit will be given for people who already have RPA status, to minimise bureaucracy.

The proposals will be applied to nuclear licensed sites as well as to other users of radioactive materials.

This paper will outline the expectations that the regulators have of RWAs and the employers that they advise. The arrangements lend themselves to the transition to the Radiation Protection Expert (RPE) proposed for the new BSS.

Comparing radiation protection courses in Germany and The Netherlands - a bilateral pilot

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From the previous EUTERP workshops it has been concluded that an essential element in achieving free traveling of RPEs, RPOs and especially RWs within the EU Member States, is the availability of a good comparison of the content of the RP courses in the various Member States. In 2010 a pilot started with representatives from Germany and The Netherlands focusing on RP courses in both countries. This pilot is of great importance for both countries as there are in particular many RWs, especially in the medical field, crossing the common border between the countries.

The pilot, that is carried out as part of an apprenticeship of the Dutch ‘Level 2’-Course for RPEs, will end before the summer of 2011.

In the presentation the design of the project will be discussed, along with the first results of the pilot. We will also pay attention to the possibilities for extension of this project to other countries.

Harmonisation and mutual recognition of qualification in radiation protection in nuclear facilities in Switzerland and Germany

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The first part of this report first gives an overview of the regulations on quantity and qualifications of radiation protection professionals the licensees of Swiss nuclear facilities have to employ.

The second part describes the requirements on the education and training in RP depending on the different qualification levels of RP professionals and the roles and functions in Swiss and German NPP.

In the last part I will show the situation about the harmonization of these levels as well as who is responsible of the recognition of RP qualifications and how it works on both sides of the Swiss-German border.

Training of Radiation Protection Experts

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Romanian Regulatory body requirements in the nuclear field, in compliance with the new Draft Euratom Basic Safety Standard Directive, ask for recognition of radiation protection experts a complex training.

In this context, Nuclear Training Centre (CPSDN), department within the National Institute of R&D for Physics and Nuclear Engineering “Horia Hulubei” IFIN-HH, is developing a training program for radiation protection experts (level 3).

Course syllabus is based on IAEA Training Course Series No. 18 “Postgraduate Educational Course in Radiation Protection and the Safety of Radiation Sources” and has a modular structure depending on the type of radiation source.

Due to the fact that participants already have a previous training and practice in the field of radiation protection, CPSDN extended practical training with contributions of RPEs with recognized / appreciated experience.

Each participant has to prepare a dissertation project to complete the training course, which is presented to the others participants and examination commission.

The participants’ results obtained untill now prove that the program is very useful and well appreciated.

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The new BSS definitions of the radiation protection professions and their effect on the Greek legislation

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The Greek National Radiation Protection Regulation (NRPR) is based on the BSS 96/29 and MED 97/43 Directives and thus includes the definitions equivalent to the Qualified Expert (QE), the Radiation Protection Expert (RPE) and the Radiation Protection Officer (RPO). The Medical Physicists (MP) in Greece, play the role of RPE for the medical applications. Furthermore, the MPs with an additional specialized training or experience can also be assigned as RPE for non-medical applications.

However, RPOs as defined in BSS, merely function in the country and almost exclusively in the industrial radiography business, where a radiographer –holder of a Level II diploma- can be assigned as a so-called “Safe Source Officer” who has the same responsibilities as a RPO. Thus, the revised BSS will obviously introduce changes in the national legislation in order to fully adopt the new requirements.

The evaluation of the training provided is made through the assessment of the relative syllabi which results to a certificate of competence issued by the GAEC for the different RP professions in the medical sector. In industrial sectors the evaluation of the training is assessed by GAEC on a case by case basis. Due to the different needs in radiation protection issues within EU countries, each country has established its own standards for RP professions. Thus, ECVET system could be a useful tool for harmonization, through definition and establishment of common standards (e.g. minimum experience for RPOs) among EU countries, in accordance with individual needs; ECVET will additionally contribute to mutual recognition issues.

No shortcomings in RP professions are foreseen in Greece; however a period of adjustment will be needed in order to implement the RP professions as defined in the new BSS.

The role of regulatory authority on radiation protection training in Lithuania

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Radiation Protection Centre (RPC) is a regulatory authority that plays important role not only in Radiation Protection (RP) Supervision and Control, but also in creation and regulation of RP Training system in Lithuania. The Law on Radiation Protection is the main legal document in Lithuania requiring that persons dealing with ionizing radiation sources and persons responsible for RP (RPO) in the facility having a license for activities with ionizing radiation sources must undergo compulsory training in the field of RP before starting the work and periodically. Employers must organize at their own expense training of the workers and RPO. Following persons must undergo training in RP field: RPO, workers dealing with radioactive sources, government officials, staff working in the field of management of emergency situations (firemen, police officers, workers of medical emergency service), administration members and heads of Scrap Metal Yards, administration members and heads of Scrap Metal Recycling Facilities, heads and heads of departments and officials of State Border Guard Service and heads of organizations and heads of departments and officials of Custom Service.

The type of training required, the course content, the duration and level of training, frequency and procedure of training, assessment of knowledge, instructing of workers, training programmes, order of organization of trainings, the appraisal of trainees and certificate issuing are defined in two main legal acts. Main requirements for minimum educational level and work experience for some groups of professionals are pointed in Lithuanian legislation too. In Lithuanian legislation it is declared that RPC has possibility to perform an evaluation of knowledge of RPO and workers dealing with ionizing radiation sources during the inspections in the facility.

There are three training centres in Lithuania that provide RP courses for workers dealing with ionizing radiation sources and RPO and have an adequate administrative structure, training facilities, training material and equipment. They are organizing informal training (compulsory training on RP and refreshing courses). Practical part of trainings is organized in facilities using ionizing radiation sources. It is available classroom based training and on the job training (OJT), but still there is not available distance learning or e-Learning.

There are these types of training mechanisms existing in Lithuania: main training course, refresher courses, specialized short training courses, OJT. RPC supervises and controls the quality of trainings organized by training centres to ensure the appropriate knowledge and skills of the workers dealing with radioactive sources and RPO to work safely.

Systematic approach to training. Is it only a tool for successful design and implementation of training, or also an instrument to support international recognition of qualifications?

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Systematic approach to training (SAT) is well established tool for the design and implementation of training in many fields and companies where effective training is essential for safety, and also effectiveness of operations and production. SAT incorporates all aspects of training process, and consists of five steps starting from analysis stage, when required knowledge, skills and attitude (KSA) are identified and defined, then design phase, when the training approach is defined, development phase, when training materials are developed, the implementation phase and finally the evaluation phase when the effectiveness of training and required revisions of training are identified.

This approach may look too extended and demanding for certain jobs, but successful an effective training definitely must include efforts and results from all stages of SAT, although maybe not in explicit and self-contained way. However, tools used in SAT can generate results which can be used to compare and verify different training processes on the basic level.

Due to the involvement in the training process for NPP as a subcontractor, we had to involve in the SAT process and apply the approach to the training. Experience from this activity enabled us to use the approach also in the radiation protection training. What we have learned is, that the tools from SAT could be used to verify and analyse also other training processes against requirements of our training. This comparison is not necessary simple and straightforward, but gives us possibility to identify basic distinctions regarding our requirements and also to recommend actions for overcoming it.

In my presentation the basic steps of SAT will be reviewed and some practical results of SAT tools implementation for the recognition of foreign training in our Nuclear Training Centre will be presented.

Overview of the RP Action Plan - the ENETRAP's II tool to enthuse the YG with RP

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The Work Package 10 was in charge, as included in Annex 1 to the Grant Agreement, to handle the problem of the development of an ENETRAP II coordinated approach on attracting of young people to RP.

Today's challenge in the field of radiation protection involves measures to make the work in radiation protection more attractive for young people and to provide attractive career opportunities, and to support of young students and professionals in their need to gain and maintain high level knowledge in radiation protection.

In order to meet RP future needs, it is necessary to attract more young people by awaking their interest in radiation applications and radiation protection already during their schooldays and later on during their out-of-school education (university or vocational education and training).

The WP 10 objectives for the period (1.03.2009-28.02.2011) were:
1. Enthusing YG with radiation research and applications;
2. Positive measures to recruit and educate young people as experts, technicians and skilled staff in the radiation protection field: from school to university and in industry, medicine and research itself;
3. Building the RP Action Plan as the ENETRAP's II instrument to enthuse the YG with RP;
4. Developing the collaboration with main RP stakeholders for building new innovative RP generations.

Within ENETRAP II-WP 10 a special attention is given to encouragement of the targeted groups, which are able to increase the inlet flow into the RP HR reservoir, the high school *science/STEM teachers* & *students and* the *early-stage researchers*.

The main conclusions on the results and achievements of WP 10 are:
- All foreseen objectives were achieved;
- The WP 10 produced eight notable achievements, in line with the WP 10 objectives;
- By leveraging and capitalization of the results and achievements of WP 10, WP4 and WP6 was developed an RP Action Plan as a tool to inspire and support the two targeted groups that would increase the inlet flow into RP human resources reservoir.

WP 10 further developments, after the end of the WP10, regards to get the resources to put in march the RP Action Plan. It would be possible by an application to EURATOM calls. The initiative group for the application would be those members of ENETRAP II network interested on the new RP innovative generations.

Poster presentations

On the needs to respond to malevolent uses of ionising radiation

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Scenarios involving the malevolent uses of ionising radiation have since September 11, 2001 been increasingly used in emergency preparedness and resilience exercises in Europe and elsewhere. One of the most common scenarios involves the use of an improvised explosive device containing radioactive materials – also known as radiological dispersal device – deployed in an urban environment.

In the Euratom 6th Framework Programme, the European Commission co-sponsored the development of a handbook for the triage, monitoring and treatment of the public exposed after a malevolent use of radiation (TMT Handbook, http://www.tmthandbook.org). This handbook addresses several potential scenarios and describes the actions to be carried out by qualified personnel at the scene and at the specialised trauma centre at the hospital.

During the preparation of the handbook it became clear that there is a need to introduce a new type of first responder namely, the "radiological responder". Staff carrying out this function would need to arrive as soon as possible after police, ambulance and firefighters, and would work together with ambulance staff and paramedics to determine the priority order with which victims will be treated and transported to the hospital based upon his/her assessment of the presence of the external contamination, combined with injuries and possibly signs of exposure to gamma radiation.

This work will elaborate on the training and preparation requirements needed for this type of professional to carry out the triage and radiation monitoring of victims using the methodologies, procedures and technology outlined in TMT Handbook. It will also cover the contents and findings of the first TMT Handbook training course as well as future plans and activities to train health physicists and medical personnel to recognise quickly and effectively the signs and symptoms associated with exposure to ionising radiation.

Training program for Radiation Protection Experts in Almaraz NPP

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Recently, Tecnatom has successfully trained eigth Radiation Protection Experts at Almaraz Nuclear Power Plant following a specific training program based on INPO methodology for task analysis. This analysis was previously developed by Tecnatom evaluating the functions for this specific position. From this task analysis, knowledges were identified and grouped into training objectives related to specific environments (classroom, plant and laboratory) which led to establish a theoretical training program as well as a practical one.

Following INPO recommendations, and also Spanish Regulations (Technical Instruction IS – 03), RPEs were trained in theoretical skills following a two weeks course and a three months practical course inside the nuclear power plant under direct supervision of a trainer, in order to gain the required ability.

Nowadays, Tecnatom has improved the task analysis methodology and has developed three steps Task Analysis System which allows a better follow-up of the training objectives required to every Spanish NPP worker.

Radiation protection education and training for medical personnel

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Courses in radiation protection under the terms of Guideline „Radiation Protection in Medicine" (according to Radiation Protection Ordinance)

The required competence in radiation protection will generally be gained by suitable education, practical experience and successful participation in radiation protection courses, recognised for both the particular occupations and applications.

The Guideline „Radiation Protection in Medicine" (according to Radiation Protection Ordinance) provides in the appendices 1, 2 and 3 detailed descriptions of competence requirements, including the minimum duration of work experience required for a specific application, as well as the content and duration of courses for medical doctors, medical physics experts and technical assistance staff. Compulsory refresher courses must be successfully completed every 5th year.

More detailed information about the courses duration and content are presented in the poster.

Radiological safety training for radiation workers in nuclear fuel plant Pitesti Romania

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1. Introduction

Nuclear Fuel Plant (FCN) is a subsidiary of National Society NUCLEARELECTRICA SA. FCN is a facility for manufacturing of the nuclear fuel bundles CANDU type with 37 elements, based on *natural uranium* (0.711% U-235) and *depleted uranium* (a small quantity with 0.25% U-235 and 0.52% U-235). The annual production is about 10,000 fuel bundles CANDU type that means about 200 tons of natural uranium in UO2. The depleted uranium is processing in campaigns only at the starting of a new unit from Cernavoda Nuclear Power Plant. The personnel working in FCN is about 420 people, and the activity is continuously.

2. Training of radiation workers (RW)

2.1. General

The only responsibility held by the radiation worker is that he works in a safe manner. This is not only with respect to his own safety, but also to that of his colleagues and does imply a degree of basic competence. “Working safely” means respect of relevant radiation safety procedures. While the complexity of the latter will depend on the application, provided the individual knows and understands the consequences of not respecting to instructions and procedures, then the training provided has been effective. In general, the extent of the required ability is that the individual is able to recognise risks and potentially dangerous situations and know what the next step is. An understanding of the magnitude of the hazard and the degree of risk presented is vital.
There is a wide range of radiation safety training available for RWs but in FCN there are three: training the managers of compartments, training category A of exposure and training the exposure B. Typically duration is 1 or 2 days. In the main, formal courses all follow a similar format, that being a mixture of classroom presentations and handling the dosimetric equiment.

2.2. Ability, competence and suitability

An effective radiation worker is one in which the individuals are competent in the roles that they undertake. In practice, what an employer requires (and this may or may not be a regulatory requirement) is that an individual is competent in the role or function that he is required to undertake and is suitable for appointment in that role.

2.3. Requirements for training and education of RWs and recognison

The specific duties of the RWs depend on the nature of the practice and have to be established by local rules and procedures. The responsibilities of the RWs are defined in the current Romanian legislation in force. Provide all personnel working in radiologically controlled areas on FCN with adequate information on RP rules, the logic behind them and their implementation. Instruct beginners on how to manage risks in radiologically controlled areas.
According to the regulations, the RWs have to respect the local rules and radioprotection procedures, are subordinated to the radioprotection technicians and RPO and have to report any abnormal situation or malfunction which could affect the safety, any incident and to participate by their established roles in emergency situations. He recognison is done by issuing the permit level 1 in the nuclear field.

Training and authorization for persons involved in radiological safety in nuclear fuel plant Pitesti Romania

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1. Education, training, recognition of persons involved in radiological safety

1.1. Radioprotection Officer - RPO

According to the Romanian legislation in force the RPO is the person who is responsible to ensure compliance with the regulations in controlled and supervised areas and shall to obtain a work permit level 2 granted by CNCAN based on examination. In the Romanian legislation is stated that for each controlled/supervised area at least one RPO shall be nominated for ensuring that work with radiation is carried out in accordance with the requirements of any specified procedures or local rules. A number of 19 FCN employees (01 Jan 2011) were certified by CNCAN for possessing the permit level 2 for working in the nuclear field for different domains. Part of them is classified like RPO and they are nominalised on FCN authorizations. The name given in FCN is Responsible with Radiological Safety (RSR):

a) Nuclear Raw Material – Fuel Elements Fabrication
b) Unsealed Radioactive Sources – Other applications with URS
c) Sealed Radioactive Sources – Other applications with SRS
d) Radioactive Material Transportation - Non-fissile material

The RPO certificate is valid for 5 years and then must be renewed. This is in effect a focussed Continuous Professional Development.

1.2. Refresher Courses - contributions to improve the education and training activities

FCN carries out education and training activities in radiation protection in the frame of courses organized by several other institutions . These activities are less oriented to provide knowledge on standardized methodologies or to develop harmonised education programmes, as they have to comply with the specific objectives of the organizers of the courses. The last refresher course was organized in march 2008 with the participation of 13 persons involved in FCN in radiological safety/radioprotection (RPO, managers of compartments). Lectures was given in courses organised by the Institute for Physics and Nuclear Engineering Horia Hulubei (IFIN-HH) National Center for Nuclear Training (CPSDN). The refresher course was approved by CNCAN by emitting Approval no 33/2008. The theme of this course was „*Radiological safety in fabrication of CANDU nuclear fuel*". At the end of the refresher course was susteined an exam with questions included in the syllabus. The duration of recycled course is 5 days, one time at 5 years. At the end of the course an examination following the domains mentioned. The verification test has 60 questions. After the graduated of the refresher course the persons was examined by CNCAN for obtaining the work permit level 2 on the domains mentioned.

1.3. Radiation Protection Technicians

In Department of Nuclear Safety (DSN) is organised a Laboratory for Radioprotection and Personal Dosimetry (LRDP) who is responsible for:

- the measurements of individual doses;
- the measurements of work-place doses, contamination monitoring;
- radiological monitoring;
- personnel training and examination;
- issuing the work permit level 1.

Training modules for Radiation Protection Expert (RPE) and Exposed Workers (EW) in Italy: some examples of applications

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In the framework of the Italian directives concerned with the physical surveillance around radiation facilities, it is well known that three following degrees of expertise are legally foreseen and appropriate professional preparation is required to pass the exam at the Ministry of Labour and obtain the qualification of "Qualified Expert of I, II and III degree" (RPE):

1. first degree is for the physical surveillance of radiation sources constituted by radiological equipments accelerating electrons with maximum tube voltage below 400 kV;
2. second degree is for the physical surveillance of radiation machines accelerating electrons of energy between 400 keV and 10 MeV or radioactive materials, including neutron sources which average fluence rate on the whole solid angle should not overcome 10^4 ns^{-1};
3. third degree is for physical surveillance on nuclear power installations and all the radiation sources above the limits stated at points 1 and 2.

For each of the three levels 120 days of training "on the job" under the tutorship of a Qualified Expert are mandatory before undergoing the exam.

Also the exposed workers (EW) should be trained in an appropriate way in order that they are aware of the risks related to the usage of radiation sources and the working conditions in the related areas. In Italy, it is generally the RPE, on behalf of the employee, in charge for such information and training.

Both the above aspects are within the scope of the ENETRAP-II European Project, whose final main goal is the possible mutual recognition of the expert figures in the field of physical surveillance (RPE and RPO) and takes care of all the necessary training actions to be put in practice, including the Training of EW.

In Italian research Institutions like ENEA and also in the Hospitals, RPEs in charge of the radiological surveillance usually provide a well established series of learning modules to ease the preparation of the future RPEs and for the apprenticeship of EW.

In the present paper, one example is presented related to the training of RPE of the three degrees as offered in the Frascati Center of ENEA by the Radiation Protection Institute and two training modules for the EW, proposed at ENEA Bologna by the Radiation Protection Institute and at the Health Physics Service of the University of Bologna.

Guidance for implementation of the requirements for radiation protection education, training and information

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The draft Euratom Basic Safety Standards specify in Title V Requirements for Radiation Protection Education, Training and Information. There it is requested that Member States established an adequate legislative and administrative framework for providing appropriate radiation protection education, training and information to all individuals whose tasks require specific competences in radiation protection. In particular, appropriate education, training and retraining has to be in place to allow the recognition of radiation protection experts, medical physics experts, occupational health services, and dosimetry services.

The European Commission has launched a number of projects which have different objectives, but their results will contribute in the end to support the later implementation of these requirements by the Member States. An overview is given of the different projects and their objectives and new guidance documents are proposed to help Member States to establish an adequate framework for providing appropriate radiation protection education and training.