

## 15<sup>th</sup> European ALARA Network Workshop and 5<sup>th</sup> EUTERP Workshop

Rovinj, Croatia 7-9 May 2014

### “EDUCATION AND TRAINING IN RADIATION PROTECTION: IMPROVING ALARA CULTURE”

#### SUMMARY AND RECOMMENDATIONS

##### WORKSHOP OBJECTIVES AND PROGRAMME

This joint EAN-EUTERP Workshop considered how radiation protection (RP) education and training programmes can be delivered effectively, and, in particular, how these can improve radiation protection in practice and help disseminate ALARA culture. The Workshop, which was hosted by EKOTEH Dosimetry Radiation Protection Company, was officially opened by Mr Sasha Medaković, Director of the Croatian State Office for Radiological and Nuclear Safety (SORNS).

There were 71 participants from 22 different countries, with half the programme devoted to presentations (including posters), and half to Working Group discussions based on the following topic areas:

- Building ALARA into radiation protection training programmes
- Measuring the effectiveness of training
- The role of qualification and recognition schemes
- Training tools and methods
- National approaches to training

Some key themes and issues did emerge from the workshop presentations, and these are described below. On the final day, the conclusions and recommendations from the four working groups were presented and discussed, and these are also summarised below.

All the presentations are available to download from the EAN and EUTERP websites (<http://www.eu-alara.net/> and <http://www.euterp.eu/>).

##### THEMES AND ISSUES ARISING

###### ***ALARA culture and radiation protection training***

As a joint EAN-EUTERP workshop it was interesting to explore the relationship between RP education and training, and ALARA culture. These are interdependent: an organisation with a strong safety culture identifies training needs and provides motivated participants; and well-designed training should, in turn, foster this culture. Through EUTERP and the ENETRAP projects, much valuable work has been done in terms of defining and agreeing the roles of the Radiation Protection Expert (RPE) and the Radiation Protection Officer (RPO), to help promote a harmonised approach in Europe through implementation of the Basic Safety Standards Directive (BSS). Through EFOMP and the MEDRAPET project similar activities were performed in relation

to the Medical Physics Expert (MPE). This work has included detailed considerations of education and training requirements, especially for RPEs and MPEs.

In comparison, ALARA culture is relevant to all exposure situations, and should involve all stakeholders. Previous EAN and EUTERP workshops have highlighted the importance of training – not just for defined roles such as the RPE/MPE, but also for workers and other stakeholders, such as managers, equipment suppliers, and competent authorities. It was agreed that a wider focus was needed in future, to encourage the development of training matrices in which the training strategies, objectives and outcomes for different groups of stakeholders are defined.

### ***Competence and culture***

Traditional approaches to defining education and training requirements have started from the basis of academic qualifications, which are then supplemented with RP-specific training courses. While these approaches are still relevant, it is now recognised that the goal of education and training is to produce “competence”, which is built upon acquired knowledge, understanding and skills. The Workshop strongly recommended that “soft skills”, such as leadership and communication, should also be considered. For persons such as RPEs, MPEs and RPOs, who have a role in promoting ALARA culture, these are especially important skills, and it was agreed that they should form part of the competency requirements.

It was also agreed that defining training outcomes in terms of knowledge, skills and competence helps underpin the practical implementation of ALARA. It was noted, however, that ALARA culture is also defined by personal attitudes and behaviour. While these factors cannot be instilled through training alone, they can be encouraged, i.e. by training which is designed to promote reflection and a questioning attitude. This can provide a bridge between training and ALARA culture, and should form part of the training objectives.

### ***Assessing the effectiveness of training***

The ultimate goal of this education and training is better radiation protection. Like other protection options, training should be optimised to deliver the maximum benefit without being unduly expensive or time-consuming, i.e. it should be both effective and efficient. There was little discussion about efficiency, although it was noted that the resources generally allocated for training are increasingly limited.

In contrast, assessing the effectiveness of training was a major theme throughout the workshop. Traditionally this has relied on written tests at the end of training courses; these can test knowledge and understanding, and (to some extent) how trainees might apply these in a practical scenario. It was noted that practical skills can be more directly tested using practical assessments, done under the observation of the trainers, although the quantitative marking of performance is not straightforward.

Ideally, the effectiveness of training should be demonstrated by tangible improvements in radiation protection. Work-related benchmarks such as radiation doses or the frequency of incidents were discussed; however it was concluded that these were only useful in a few specific, well-defined circumstances. A better option would be to find a means of assessing individual attitudes to radiation protection, ideally before and after training. This approach is relatively unfamiliar to the radiation protection community, and it was suggested that expertise from the social sciences should be sought.

### ***Methods and tools***

Various presentations and posters gave details of different national approaches to training, which remain diverse even under the harmonising influence of the BSS. There was, however, broad

agreement on the types of training methods and tools that are best suited to developing and sustaining an ALARA culture, i.e.:

- Training should be interesting and engaging, and directly relevant to the trainees' work
- It should include realistic practical exercises, designed to demonstrate the application of radiation protection theory
- Emphasis should be placed on problem-solving and trainee-to-trainee interaction (eg group exercises) to encourage reflection and a questioning attitude.
- Practical training for incidents and emergencies should incorporate an element of stress, so that human factors can be better taken into account.

The workshop also highlighted the use of computer-based “virtual reality” training tools, which can specifically consider optimisation in potentially high dose areas, and are a valuable ALARA training and planning tool in such circumstances.

### ***Other issues***

Many other issues were presented and discussed during the workshop, and there is not sufficient space here to describe all of these. However, to give a flavour of the proceedings, these included:

- The European EQF and ECVET schemes, and approaches to mutual recognition
- The competence requirements for training providers
- Approaches to “train the trainers”
- Continued learning and refresher training

## **WORKSHOP CONCLUSIONS AND RECOMMENDATIONS**

The four Working Groups considered many of the issues already described above, and also made some specific recommendations, which are summarised below.

### **WG1: How to assess the effectiveness of training?**

- More work needs to be done in terms of assessing the effectiveness of training. There are several possible workplace indicators, such as monitoring results, individual doses, and reports of audits and inspections (including observation and assessment of behaviours in the workplace). These should be used to construct a framework for analysing the effectiveness of training.
- The above approach should be promoted by Regulatory Authorities, RPEs and professional societies.
- Effective training providers are critical to both the delivery and assessment of training, and there is value in exploring methods by which the quality of training providers can be assessed and recognised.

### **WG2: Tools to improve the effectiveness of training**

- Training is a continuous process, involving multiple stages. It is useful to define the responsibilities of different stakeholders (employers, employees, RPEs, regulatory authorities, etc) for the different stages of this process.
- Training should be practical and realistic, including the use of real radiation sources, where appropriate and subject to suitable dose constraints.

- On-the-job training is an important component of the training cycle, and should be properly structured and involve suitably trained mentors.
- “Train the trainers” is an important concept, and should include information on new training techniques and technologies, and a basic understanding of the European E&T Qualification Frameworks (ECVET, ECTS, EQF, etc.).

### **WG3: What is achieved by recognition schemes?**

- The ENETRAP project should develop guidelines for national and mutual recognition schemes, and consider whether the ECVET concepts are useful in this respect. Schemes should focus on all-round competence rather than academic qualifications.
- In turn, Member States should aim to establish clear and transparent national schemes for the recognition of RPE competence, which are then promoted by (for example) HERCA.
- A similar formal system of recognition is not considered appropriate for RPOs; however a simpler system for verifying and validating that they have received suitable training should be considered.

### **WG4: Incorporating ALARA culture into training requirements**

- Although risk is a factor in everyday life, the risks associated with radiation exposure are not readily understood by trainees, and not easily explained by trainers. However, persons can understand the difference between good and bad practice and the impacts in terms of increasing and decreasing the doses received; training should concentrate on practical examples of this.
- There is a need to develop education and training in radiation protection for the public, and this should include providing radiation protection information and data on the internet.

## **NEXT EAN AND EUTERP WORKSHOPS**

The 16<sup>th</sup> EAN workshop, on “ALARA in Industrial Radiography” is planned for March 2016, in Bern, Switzerland. Details will be announced on the EAN website. In the meantime, EAN is producing an updated version of “ALARA: from theory towards practice”. The new book will be titled “Optimisation of Radiation Protection (ALARA): A Practical Guidebook” and will hopefully be published by the end of 2014.

The 6<sup>th</sup> EUTERP workshop will be held in Athens, 30/09/2015 till 02/10/2015. The theme will be "Legislative change in Europe: the implications for training in radiation protection - Rising to the challenge".

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