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### Report on Requirements for RPO Competencies

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## Summary

This report covers the Deliverable WD 3.1 of Work Package 3 (*WP3: Define requirements for RPO competencies and establish reference standards for RPO training*): Report on requirements for RPO competencies.

Employees, appointed to act as RPOs in hospitals, industrial companies or teaching and research institutions should have an adequate level of understanding of concepts related to radiation protection and should also be acquainted with the safe and secure use of radiation sources as relevant to the application. Depending on the complexity of the radiation application and the associated radiation protection tasks, RPOs need appropriate training in radiation protection and, in some cases, a certain level of work experience tailored to the specific needs to fulfil particular radiation protection tasks. It is therefore essential, on the European level, (i) to define the required competences for RPOs according to their area of work and specific radiation protection tasks, and (ii) to establish European reference standards for RPO training.

In order to define requirements for RPOs competencies, the issue of definition and role of RPOs has been considered on the European and on the international level. It should be noted that, other than the issues of general competency and suitability, there is no prescription on the European or international level of the “specification“ of the individual being an RPO.

The appropriate route to gaining the level of competence required to become an RPO will usually be a combination of training plus relevant experience in the appropriate area of work. It is important to note that to be a competent and effective RPO requires specific personal attributes such as good communication skills and the ability to exercise sound judgement in addition to technical skills. Ideally the overall competence of an RPO to perform the required duties should be assessed (by some appropriate means) with this assessment addressing both “soft” and technical skills.

## 1. INTRODUCTION

Education, training and experience is being recognized as of primary importance for achieving competence in any area of work. Persons who are to be responsible for nuclear, radiation, transport or radioactive waste safety should have an adequate level of understanding of concepts relating to radiation protection and should also be acquainted with the safe and secure use of radiation sources. Generally, training has as a prerequisite a specified educational level. In addition, persons may need an appropriate level of work experience to fulfil particular responsibilities. Qualification of these persons necessitates recognition of the adequacy of the combination of their educational level, training and work experience. This may include consideration of the equivalence of certain elements of this combination. In some circumstances, such qualified persons may have to be authorized by a regulatory body to carry out certain functions or to assume certain responsibilities.

One of the findings in the ENETRAP project [1] was that there are significant differences in interpretation of the roles of the RPE and the RPO across Member States. These differences have a strong influence on specified legislative requirements with respect to RPE and RPO as well as on the approaches taken with respect to the competence required. On the basis of the information provided via the ENETRAP questionnaire and given the significant issues with the interpretation of key roles, it is difficult to conclude a workable *de minimus* level of training for the RPE or RPO. Further investigation of this issue is required, therefore, the results of the ENETRAP project were transferred to the EUTERP platform, a platform assembling all stakeholders, including E&T providers, professional and regulatory bodies, industry (nuclear, non-nuclear and medical), and international organisations and associations.

The overall objective of the ENETRAP II project is to develop European high-quality "reference standards" and good practices for education and training (E&T) in radiation protection (RP), specifically with respect to the RPE and the RPO. These "standards" will reflect the needs of the RPE and the RPO in all sectors where ionising radiation is applied (nuclear industry, medical sector, research, non-nuclear industry).

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 education and training of RPEs and RPOs within Europe, and will stimulate building competence and career development in radiation protection to meet the demands of the future.

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

## 2. RPO ON THE EU LEVEL

In the EU Draft BSS (version February 2010) [3], the “qualified expert” defined in the Council Directive 96/29/Euratom [4] is now described in more detail as

**Radiation protection expert (RPE):** *an individual having the knowledge, training and experience needed to give radiation protection advice in order to ensure effective protection of individuals, whose capacity to act is recognized by the competent authorities.*

**Radiation protection officer (RPO):** *an individual technically competent in radiation protection matters relevant for a given type of practice who is designated by the undertaking to oversee the implementation of the radiation protection arrangements of the undertaking.*

The definitions of the Radiation Protection Expert (RPE) and the Radiation Protection Officer (RPO) are based on recommendations given by the EUTERP Platform [2].

Since the Medical Exposure Directive [5] has been included in the new draft BSS, the medical physics expert is there described as well:

**Medical physics expert (MPE):** *an individual having the knowledge, training and experience to act or give advice on matters relating to radiation physics applied to medical exposure, whose competence to act is recognized by the competent authorities.*

With regard to the RPO, it is clearly stated in the draft BSS that the establishment of an RPO is required to perform radiation protection tasks within undertakings and that undertakings have to provide to the RPO the means necessary for them to carry out their duties. The RPO has to report directly to the undertaking. Depending on the nature of the practice, the tasks of the RPO may include the following:

- ensuring that work with radiation is carried out in accordance with the requirements of any specified procedures or local rules;
- oversee the implementation of the programme of workplace monitoring;
- maintain adequate records of radioactive sources held by the practice;
- carry out periodic assessments of the condition of the relevant safety and warning systems;
- oversee the implementation of the personal monitoring programme;
- oversee the implementation of the health surveillance programme;
- give new employees an introduction in local rules and procedures;
- give advice and comments on work plans;
- authorise work plans;
- provide reports to the local management.
- participate in the arrangements for prevention, preparedness and response for emergency exposure situations;
- liaison with the radiation protection expert;

Where appropriate, the task of the RPO can be carried out by a radiation protection unit established within an undertaking.

The competence required to carry out these tasks depends on the nature of the practice and can widely vary.

The European Commission is requesting an adequate legislative and administrative framework to be established for providing appropriate radiation protection education, training and information to all individuals with specific competences in radiation protection.

### 3. RPO ON THE INTERNATIONAL LEVEL

In the IAEA Glossary (Edition 2007) [8] a radiation protection officer is defined as

*“A person technically competent in radiation protection matters relevant for a given type of practice who is designated by the registrant or licensee to oversee the application of relevant requirements established in international safety standards.”*

With regard to the competence required in radiation protection, details are given in the IAEA Safety Guide on “Building competence in radiation protection and the safe use of radiation sources” [9] and the IAEA Safety Report on “Training in radiation protection and the safe use of radiation sources” [10].

In these publications, it is clearly stated that *“competence means the ability to apply knowledge, skills and attitudes so as to perform a job in an effective and efficient manner and to an established standard”*.

The Safety Guide addresses the following issues:

- Categories of persons to be trained in safety and in protection related aspects of nuclear, transport and radioactive waste safety.
- Requirements for educational levels, training and work experience for each category.
- The process of qualification and authorisation of persons.

It is clearly stated, that the regulatory body should provide guidance on qualification requirements for each category of job found in any situation of radiation exposure (planned, emergency and existing exposure situations), such as qualified experts, radiation protection officers, workers, qualified operators, health professionals, emergency response personnel, staff of regulatory bodies. This guidance should address the minimum educational level, minimum training and retraining requirements and minimum experience for each job category.

In addition, the regulatory body should enforce regulations concerning the recognition of qualifications or authorization processes relating to certain duties and/or responsibilities, such as those of radiation protection officers.

The Safety Report addresses the development and provision of training in protection and safety to persons in a range of categories involved in work with ionizing radiation. Content and level of training in modular form for categories of persons (qualified expert, radiation protection officer, occupationally exposed workers, qualified operators and staff of regulatory bodies) engaged in different practices (modules for industrial radiography, irradiators and accelerators, gauging techniques, tracer techniques, mining and milling, nuclear installations, diagnostic radiology, nuclear medicine, radiotherapy) is presented in a table.

The Safety Report emphasises that training for radiation protection officers will vary considerably depending on the radiation application, but all training should contain a certain amount of common core information on protection and safety. The depth to which each topic is covered should depend on the specific practice in which the person is being trained, and should also take into account the magnitude of the potential hazards associated with the application. In addition to adequate education, training and work experience, radiation protection officers need to have specific personal attributes, such as communication skills, leadership and analytical skills, human-machine interface skills and multitask management skills, which can be stimulated during training through practical exercises.

## 4. COMPETENCE REQUIREMENTS OF THE RPO

An important statement of a survey of the present situation of the radiation protection expert in the EU Member States and applicant countries [11] was that it is difficult to draw any common, unambiguous dividing line between an RPE and an RPO. It is clear that some RPE have also the function of an RPO in his/her institution and some RPO can certainly be considered as RPE.

It should be noted that, other than the issues of general competency and suitability, there is no prescription on the European or international level of the “specification“ of the individual being an RPO. The important issue is that the RPO is required to maintain close supervision of the organisation’s work with radiation – therefore, wherever practicable, the RPO should be an employee of that organisation.

### 4.1 Role of the RPO

In most cases, a person carries out the duties of an RPO on a part-time basis, in addition to his other duties as an employee. Examples are given in the IAEA requirements for training of radiation protection officers [12]:

- In organisations where the use of radiation is incidental to the company’s main work such as gauges, static eliminators etc., the RPO is likely to be an existing employee with a role that already involves supervising general work with the sources of radiation. For example, a foreman supervising a production line where gauges are used for process control), or possibly an employee with other responsibilities for general safety.
- In industrial organizations where the use of radiation is fundamental to the main work of the company, such as industrial radiography and industrial irradiators, the person selected by management to be the RPO is likely to have some existing background or some training involving radiation protection. For example, in an industrial radiography company, the RPO is likely to be a senior (or experienced) radiographer; in an industrial irradiator facility the RPO may be a production manager.
- In medical facilities that use radiation there is likely to be a range of people with some background in radiation protection who may be suitable for appointment as RPO. For example, medical physicists, technicians, medical doctors etc.

In all cases senior management needs to ensure that the RPO is appropriately trained and competent in radiation protection and should ensure that the RPO is given sufficient time to carry out the required duties.

The specific duties and responsibilities of the RPO will depend very much on the practice being undertaken, and the availability of radiation safety expertise within the practice. In a large facility, for instance, the RPO may have well-defined functions relating to a specific area, with other RPOs and radiation protection experts carrying out related duties in different parts of the plant. By contrast, the RPO in a company with a straightforward application like a level gauge may be the only person with any knowledge of radiation safety and may have a wider range of duties to perform.

It follows that the duties of RPOs are very dependant on the practice in which they work and the existing safety infrastructure of the facility. However, there are a range of ‘core duties’ that RPOs are likely to carry out, regardless of the practice in which they work:

- Supervision of work to ensure compliance with local rules and national regulations.
- Carrying out, or supervision of, workplace monitoring.

- Supervision of arrangements for individual monitoring.
- Keeping of source records.
- Responsibility for ensuring the maintenance of equipment and safety systems relating to the practice.
- Responsibility for ensuring the performance testing of new installations, or ensuring the validation of new procedures.
- Implementation of emergency plans.

It is important to note that there is no requirement for the RPO function to be a full-time post. In the majority of practices, the RPO role may only be a small component of the person's work. Conversely, the role of RPO in more complex practices may be a full time post, or it may be divided among several people. Regardless of the approach adopted, however, it is very important that RPOs receive sufficient training to carry out their function.

## **4.2 Educational Requirements of the RPO**

RPOs should have as a minimum a secondary educational level corresponding to a scientific or technical curriculum including 10 to 12 years of schooling [10]. However, the educational level of a radiation protection officer will be dependent on the skills and technical requirements of the job as well as on radiation protection needs. For some facilities, i.e. complex situations with the potential for significant dose, a tertiary educational level should be considered appropriate; for example, in some research establishments or, with respect to the appropriate use of advanced nuclear techniques, in some medical facilities.

## **4.3 Training Requirements of the RPO**

The RPO must be provided with sufficient training to enable him to be able to effectively carry out his supervisory duties. However, education and training are only two of a number of attributes that result in a person being both competent and suitable to act as an RPO for a practice. The provision of training covering the core information that is required for all RPOs will provide an appropriate level of knowledge, but this will need to be re-enforced with practical experience of the application of this knowledge before the RPO can be said to be competent.

The RPO may need to have further practice-specific training and experience before he is considered suitable for a specific practice. For example, an RPO may be considered to be competent and suitable for a straightforward practice, such as industrial gauges, if he has a good understanding of the core requirements of the RPO role, together with experience of applying this knowledge in the field. However, such a person will not be a suitable RPO for industrial radiography without first receiving additional training and experience on the radiation protection issues associated with this area of work. It follows that RPO training will fall into two categories: core training, common to all practices, and supplementary training related to practice-specific radiation protection elements.

By definition a "competent and effective" RPO will also have specific personal attributes such as good communication skills and the ability to exercise sound judgement i.e. be capable of analysing a situation and coming up with a pragmatic course of action. A complete assessment of the competence of a person to act as RPO will also include an assessment of the person's ability to apply knowledge effectively using these skills. This could be done by observing the person's performance at work or by setting the person an exercise to carry out.

The formal training of RPOs should involve covering a core syllabus and, as appropriate, a supplementary module pertinent to the practice in question. These materials may be covered separately or combined into a single course depending on the availability of participants.

Classroom based training is unlikely to cover all the practical radiation protection and safety aspects and skills associated with specific work tasks; hence additional experience in the workplace and on the job training can be very effective in the overall training programme for RPOs. In this form of training the participant works in the normal place of work either under the direct supervision of, or with indirect input from, an experienced mentor.

The participant's progress and achievements may be recorded on a checklist of topics and tasks. On completion of the training, the supervisor and participant should prepare a comprehensive report describing the participant's progress, the areas of competence gained and any further training needs. The duration of this additional training will be dependant on the complexities of the practice and the RPO's previous work experience.

One of the findings of the ENETRAP project [1] was that most European countries have already established a combination of formal training and OJT/work experience in their regulatory system.

## 5 CONCLUSIONS

Depending on the complexity of the radiation application and the associated radiation protection measures, RPOs need appropriate training in radiation protection and a certain level of work experience tailored to the specific needs to fulfil particular radiation protection tasks. It is therefore essential, on the European level, (i) to define the required competencies for RPOs according to their area of work and specific radiation protection tasks, and (ii) to establish European reference standards for RPO training.

In order to define requirements for RPOs competencies, the issue of definition and role of RPOs as well as training requirements has been considered on the European and on the international level.

The appropriate route to gaining the level of competence required to become an RPO will usually be a combination of training plus relevant experience in the appropriate area of work. It is important to note that to be a competent and effective RPO requires specific personal attributes such as good communication skills and the ability to exercise sound judgement in addition to technical skills. Ideally the overall competence of an RPO to perform the required duties should be assessed (by some appropriate means) with this assessment addressing both "soft" and technical skills. The details of the required competencies according to the RPO's area of work and reference standards to be established for RPO training will be presented in WD 3.2.

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