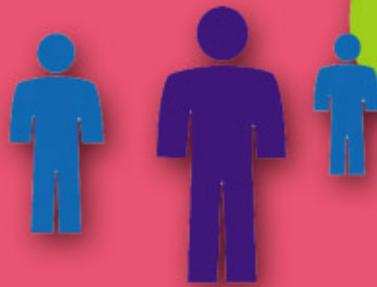


# RADIATION PROTECTION



The status of the radiation protection expert  
in the EU Member States  
and applicant countries

Issue N° 133





EUROPEAN COMMISSION

# **Radiation Protection 133**

## **The Status of the Radiation Protection Expert in the EU Member States and Applicant Countries**

*Study on Education and Training in Radiation Protection*

Directorate-General for Energy and Transport  
Directorate H — Nuclear Safety and Safeguards  
Unit H.4 — Radiation Protection

2003

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## List of abbreviations

EU	European Union
EC	European Commission
QE	Qualified Expert
RPE	Radiation Protection Expert
RPA	Radiation Protection Adviser
RPO	Radiation Protection Officer
MPE	Medical Protection Expert
IAEA	international atomic energy agency
BSS	Basic Safety Standards
WPET	Working Party Euratom Treaty
NRG	Nuclear Research and Consultancy Group, Petten, the Netherlands
IRPA	International Radiation Protection Association
UK	United Kingdom
ADR	Accord Européen relatif au transport international des marchandises Dangereuse en Route
IRR99	Ionising Radiations Regulations 1999
HSE	Health and Safety Executive
RSA93	Radioactive Substances Act 1993
EA	Environment Agency
SEPA	Scottish Environment Protection Agency
ERPC	European Radiation Protection Course
ESNM	European School of Nuclear medicine
ERC	European Radiopharmacy Course
EANM	European Association of Nuclear Medicine
STUK	Finnish Radiation Protection Institute

## **Glossary of relevant terms**

### Qualified Expert (QE)

*“Persons having the knowledge and training needed to carry out physical, technical or radiochemical tests enabling doses to be assessed, and to give advice in order to ensure effective protection of individuals and the correct operation of protective equipment, whose capacity to act as a qualified expert is recognised by the competent authorities. A qualified expert may be assigned the technical responsibility for the tasks of radiation protection of workers and members of the public.”*

(Council Directive 96/29/Euratom)

### Radiation Protection Expert (RPE)

In principle the same definition as the QE, but not necessarily recognised by the competent authorities. This term was introduced for countries who had not adopted Council Directive 96/29/Euratom yet

### Radiation Protection Adviser (RPA)

*"An RPA is an Individual who meets the HSE (Health & Safety Executive) Criteria of Competence"*

Only defined in the UK (Ionising Radiations Regulations 1999)

### Radiation Protection Officer (RPO)

Persons appointed by their employer to perform certain task in radiation protection including supervision of practices.

### Medical Protection Expert (MPE)

*"An expert in radiation physics or radiation technology applied to exposure, within the scope of this Directive, whose training and competence to act is recognized by the competent authorities; and who, as appropriate, acts or gives advice on patient dosimetry, on the development and use of complex techniques and equipment, on optimization, on quality assurance, including quality control, and on other matters relating to radiation protection, concerning exposure within the scope of this Directive"*

(Council Directive 97/43/Euratom)



## Summary

This report describes a survey of the present situation of radiation protection experts (RPEs) in the Member States of the European Union and the Applicant Countries. In addition to that, it investigates the interest in the establishment of a discussion platform to allow for a better harmonisation of education and training requirements in the different areas of radiation protection. The survey was carried out on behalf of the European Commission, after a recommendation of the Working Party on Education and Training of the Group of Experts according to Art. 31 of the Euratom Treaty. The study covered all qualification aspects of RPEs, including current definitions and other regulatory provisions and requirements, the legal status, pre-educational requirements and the duration of the education and training trajectory.

The objectives of the project were:

- To survey the present situation of RPEs in all Member States and Applicant Countries.
- To identify the needs, requirements and procedures to move towards the mutual recognition of qualified experts in the context of the European single market and enlargement process.
- To review the current strategy on training and education in the field of radiation protection.
- To encourage the establishment of a discussion platform at a European level for the exchange of information on education and training relating to radiation protection of RPEs.

The regulatory framework and existing functioning of RPEs have been investigated in all Member States of the European Union, as well as in the Applicant Countries: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia and Turkey. In particular, the study provided the following results:

- An overview of the definitions, legal basis, requirements and miscellaneous topics concerning the RPE.
- An overview of the structure and systems of certification and recognition of RPEs and of the requirements for the institutions organising training courses.
- An overview of the current progress, needs, requirements and procedures to move towards mutual recognition.
- Recommendations for actions by the EC to complement national policies in the field of radiation protection training and education programmes.
- Requirements for the establishment of a “discussion platform” at the European level for the exchange of information on education and training in radiation protection.

The study was limited to radiation protection of ionising radiation only. It excluded experts in radiation protection for military services and the medical physics expert (MPE) of the Medical Exposure Directive (97/43/Euratom).

The study was carried out by sending a questionnaire to the various countries that addressed all the above-mentioned aspects. To ensure a high percentage of adequate responses, a network of national correspondents was established. In drafting the questionnaire, special attention was paid to formulate it in a way that was practical and applicable in all investigated countries. To that end,

the questions were formulated in such a way that clear and comparable answers on the different subjects were possible. In order to analyse the responses properly, the questions were divided in five parts, each addressing specific topics. These are:

- Legal aspects
- Level and classification aspects
- Education and training aspects
- Recognition and registration aspects
- Mutual recognition aspects
- Discussion platform aspects

Backed-up by a guideline how to answer the questionnaire, this structure allowed easy processing of answers.

The study resulted in a fairly comprehensive overview of the present situation of the RPE in the EU Member States and the Applicant Countries. It showed the definitions and the legal status of the RPE in the regulations of the various countries and analysed the training and education systems in the field of radiation protection. Furthermore, it identified the requirements to move forward to mutual recognition of RPEs in the Member States and Applicant countries. Finally, the study revealed a wide interest in the establishment of and participation in a Discussion Platform, both as an instrument for the exchange of information and as a vehicle to move forward to mutual recognition of the RPE. It is therefore concluded that the objectives of the study have been met.

Based on the conclusions of the study, some recommendations are made. The recommendations are repeated here briefly:

- In the context of the single market and the enlargement process, it is recommended to try to achieve harmonisation in the qualifications of the RPE, according to the definition of the QE. This would help promote the achievement of the aims of the Directive on free movement of workers in the European Union and should take due note of the Directive on safety at work.
- As a means of achieving this goal, it is recommended to establish a Discussion Platform that could serve as a means for exchange of information on education, training, recognition and registration of RPEs. This Platform may provide a vehicle for moving forward to mutual recognition. The topics mentioned in the recommendations hereunder could be addressed in such a Discussion Platform.
- Definition, tasks and provisions for recognition of the RPE in the national regulations of EU Member States and Applicant Countries should be compared in detail, in order to expose the obstacles preventing a harmonised implementation of the concept of the “Qualified Expert”.
- The subdivision of RPEs according to their expertise, in connection with their tasks and duties in radiation protection in the various countries should be compared, in order to make a distinction

between radiation protection experts and radiation protection officers. This is a prerequisite for mutual recognition.

- The subdivision of RPEs according to the sector of work should also be compared. The additional requirements for recognition of an RPE in the different sectors should be exposed.
- Training programs and material, including practical work, should be evaluated and compared with, for instance, the European Radiation Protection Course and the training courses of the IAEA.
- There is a trend to move to registration (or certification) of RPEs, as a means for assuring the quality of RPEs in the longer term. Continuous training is part of such a system, as well as professional experience. The requirements and procedures for registration of RPEs, including quality assurance procedures, should be studied in more detail. This is also considered as a prerequisite for mutual recognition.
- It is recommended that the Discussion Platform should co-operate with other international bodies that are active in the field of training, education and recognition of RPEs.



## **2 Introduction**

### **1.1 Background**

Council Directive 96/29/Euratom [1] (“the BSS”) lays down the basic safety standards for the health protection of the general public and workers against the dangers of ionising radiation. It also defines the “qualified expert” and establishes requirements for their training, experience and recognition.

Annex 1 of Commission Communication 98/C 133/03 [2] (“the Syllabus”) gives the topics to be addressed in a basic syllabus for the education in radiation protection of the qualified expert. Additionally, it recommends specific topics to be included in the syllabus for five specific areas, i.e. nuclear installations, general industry, research and training, medical applications and accelerators.

In addition, Council Directive 97/43/Euratom [3] on health protection of individuals against the dangers of ionising radiation in relation to medical exposures, requires that all staff involved in administering medical exposures have adequate theoretical and practical training for the purpose of radiological practices, as well as relevant competence in radiation protection. It introduces provisions to ensure that continuous education and training after qualification is provided.

As pointed out in the Syllabus, earlier surveys indicate a wide diversity in the approaches of Member States to the training and qualifications of the radiation protection expert. This makes mutual recognition of the qualified expert, as defined in Art. 1 of the BSS, difficult between Member States. An improved level of harmonisation would be very useful, certainly when the enlargement process of the European Union is taken into account. This would also promote the aims of the Directive on the free movement of workers in the European Union and the Directive on the safety at work.

Therefore, as a first step, the Working Party on Education and Training of the Group of Experts according to Art. 31 of the Euratom Treaty (WPET) advised the Commission to survey the present situation of radiation protection experts in the Member States and Applicant Countries. In addition to that, the WPET recommended establishing a discussion platform to allow for a better harmonisation of education and training requirements in the different areas of radiation protection.

The Commission adopted the recommendations of the WPET and awarded a contract to NRG, the Netherlands, to carry out the survey. The study is conducted under contract number B4-3040/2000/311262/MAR/C1, reference ENV.C.1/ETU/2000/0104r. This report describes the findings of the survey.

### **1.2 Objectives of the study**

The objectives of the project were:

- To survey the present situation of the radiation protection experts in all Member States and Applicant Countries.

- To identify the needs, requirements and procedures to move towards the mutual recognition of qualified experts in the context of the European single market and enlargement process.
- To review the current strategy on training and education in the field of radiation protection.
- To encourage the establishment of a discussion platform at an European level for the exchange of information on education and training relating to radiation protection.

### **1.3 Scope of the survey**

The study covered all qualification aspects of radiation protection experts, including current definitions and other regulatory provisions and requirements, the legal status, pre-educational requirements and the duration of the education and training.

The regulatory framework and existing functioning of radiation protection experts has been investigated in all Member States of the European Union, as well as in the Applicant Countries: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia and Turkey. In particular, the study provided the following results:

- An overview of the definitions, legal basis, requirements and miscellaneous topics concerning the radiation protection expert.
- An overview of the structure and systems of certification and recognition of experts and of the requirements for the institutions organising training courses.
- An overview of the current progress, needs, requirements and procedures to move towards mutual recognition.
- Recommendations for actions by the EC to complement national policies in the field of radiation protection training and education programmes.
- Requirements for the establishment of a “discussion platform” at the European level for the exchange of information on education and training in radiation protection.

The study was limited to radiation protection of ionising radiation only. It excluded experts in radiation protection for military services and the medical physics expert (MPE) of the Medical Exposure Directive (97/43/Euratom).

## **2 Methodology**

In order to meet the objectives of the study, it was decided to draw up a questionnaire that addressed all the aspects mentioned in section 1.3. To ensure a high percentage of adequate responses, a network of national correspondents had to be established. Clearly, the results could only be obtained by involving local know-how in the various countries, taking into account the highly specific nature of the subject and, secondly, the problems of interpretation and translation that may arise. To that end, NRG contacted local radiation protection experts and organisations that were thought to be able to contribute to the study, by making use of existing networks.

The study was carried out in several phases, which are described shortly below.

### **2.1 Desk research**

In the first phase, the available information was studied, in particular the results of an earlier survey carried out by the WPET and a discussion paper on the minimum requirements for mutual recognition of qualified experts [4], drawn up by a working group of representatives of EU Radiological Protection Societies and the European Commission. The earlier survey of the WPET was the basis for Commission Communication 98/C 133/03 [2] and dealt with issues of the education system and the legal status of the radiation protection in the Member States. The discussion paper dealt specifically with mutual recognition, as being one of the issues where the EU radiation protection societies could play a role in stimulating harmonisation of the implementation of directives and recommendations within the European Union. In addition, notice was taken of the statement of the International Radiological Protection Association (IRPA) [5], made at the 10<sup>th</sup> IRPA Conference in Japan, May 2000, where training and education of radiation protection experts was identified as an increasingly important component of IRPA's activities. In 1991, members of the IRPA executive council were assigned to a task force to review the certification and training issue. The Task Force has conducted two surveys in 1991 and 1994. The large difference in formality, legal requirements, recognition and training methods found in the 1991 and 1994 surveys illustrated how difficult it could be to unify professional recognition on a world-wide scale. The problem of the recognition of transient radiation workers was also pointed out at the 10<sup>th</sup> IRPA Conference as something IRPA could look at in the future.

### **2.2 Preparation of the questionnaire**

The desk research led to the identification of the important issues at stake in the various Member States. Subsequently, in the second phase, a draft questionnaire was established. Special attention was paid in the formulation of the questionnaire to get information on:

- the status of the implementation of the BSS in the national regulations of the various countries,
- the current legal basis of the radiation protection expert and the comparison with the definition of the qualified expert according to the BSS,
- the different levels of expertise of the radiation protection experts and the education system,
- the system of recognition by authorities,

- the views on the formation of a discussion platform for the exchange of information on education and training.

This draft was discussed with the scientific officer of the Commission and the chairman of the WPET. The comments were taken into account in the final version of the questionnaire. The questionnaire is added to this report as Appendix A.

### **2.3 Establishing the network of national correspondents**

In parallel with phase 2, phase 3 was taken at hand, i.e. the identification of contact points in the Member States and Applicant Countries. In consultation with the scientific officer of the Commission and the chairman of the WPET, it was decided to use the presidents of the national radiological protection societies as a first entrance in a country for mailing the questionnaire. There were two reasons for this choice:

- The representatives of the radiological protection societies of the European Union that produced the above-mentioned discussion paper [4] considered this as a good basis for further work and expressed their interest in the subject.
- IRPA recognised the initiative of the European societies through the EC and decided that it may be appropriate for IRPA to act as a link on the matter of mutual recognition with the non-European Societies.

Given the broad participation of EU radiation protection societies in writing the discussion paper [4], and because of IRPA's interest in training and education issues, it was concluded that the presidents of the radiological protection societies would recognise the importance of responding to the questionnaire. Therefore, the questionnaire could best be distributed to them. In the accompanying letters, they were asked to facilitate in the response, by forwarding the questionnaire to the right contact point in their country and informing NRG about their action. In some Applicant Countries, however, there doesn't exist a radiological protection society. For those countries, use was made of two databases, one of the Applicant Countries' missions to the EU in Brussels (environment contacts) and one of the Applicant Countries' correspondents in the distinct Ministries of Environment. Both databases were made available by the European Commission. The questionnaire was sent to both persons listed in the databases and asked to co-ordinate their action to forward it to the right contact point, again with informing NRG about that action. After sending the questionnaire by post, the document was also sent by e-mail and it was requested to respond by e-mail. This was believed to facilitate the response and allowed close interaction between the project manager and the national correspondents, so that all correspondents could benefit from any question coming up in the network, fine-tuning the questions if and where necessary.

In doing so three different groups of countries were recognised:

- current EU Member States, all having an IRPA related radiological protection society (15)
- Applicant Countries, having an IRPA related radiological protection society (8)
- Applicant Countries, without an IRPA related radiological protection society (5)

## **2.4      Compilation of the data**

In the fourth phase, a database of responses was established. The database contained the national information of all responding countries and allows for all sorts of ‘crossings’ of modalities of questions. Furthermore, the database allows for a clustering of answers. The full responses are submitted to the European Commission in a separate report. The list of contact points is given in Appendix B.

## **2.5      Analysis of the data, conclusions and presentation of results**

In the last phase, the compiled data were analysed. In doing so, areas were identified where large differences between the countries exist and, on the other hand, areas where a fair degree of harmonisation was already there. The results of the study, including the analysis and a list of conclusions and recommendations, are presented in this report.



### 3 Qualified Experts and Radiation Protection Experts

In Title I of the BSS qualified experts are defined as

*“Persons having the knowledge and training needed to carry out physical, technical or radiochemical tests enabling doses to be assessed, and to give advice in order to ensure effective protection of individuals and the correct operation of protective equipment, whose capacity to act as a qualified expert is recognised by the competent authorities. A qualified expert may be assigned the technical responsibility for the tasks of radiation protection of workers and members of the public.”*

Key points in this definition are:

- Knowledge and Training (Radiation Protection, Dose assessment, Advice)
- Recognition

The first key point refers to the knowledge of the qualified expert and his ability to perform certain tasks in radiation protection. Acquiring this knowledge might be the result of education and the ability to perform the duties of a radiation protection expert needs certain training. So, education and training is the basis on which the qualified expert acquires his capacity to act as such though relevant experience is also necessary.

The second key point refers to the formal status of a qualified expert. Not only education and training is needed, but also recognition by the competent authorities. When a country has defined a qualified expert and recognised it, the first step towards mutual recognition has been made.

Where the definition of the "Qualified Expert" is not specified in a country's law, the term "Radiation Protection Expert" is used as an alternative in this study. Where Qualified Expert (QE) refers explicitly to the definition in the BSS, the term Radiation Protection Expert (RPE) refers to the specific definition used in a country's law (although these definitions may probably be more or less equal).



## 4 Set-up of the Questionnaire

To meet the objectives described in chapter 1, the questionnaire was set up addressing a number of topics. Besides, different aspects derived from the definition of the QE were addressed.

In drafting the questionnaire, special attention was paid to formulate it in a way that was practical and applicable in all investigated countries. Therefore, on the one hand, it needed to be clear on the objectives and the outcomes sought, on the other hand however, its wording needed to be open and flexible, avoiding all sorts of semantic discussions. To that end, the questions were formulated in such a way that clear and comparable answers on the different subjects were possible. In order to analyse the responses properly, the questions were divided in five parts, each addressing specific topics. These are:

- **Legal aspects:** How are RPEs defined in the different countries? Is the definition comparable with the definition of the QE in the BSS? What is their legal status?
- **Level and classification aspects:** What are the requirements for RPEs in the different work areas? What should be their level of expertise and experience?
- **Education and training aspects:** What is the primary radiation protection course level of the expert? How often do they have to attend refresher courses? Is there an accreditation system for the organisers of radiation protection courses?
- **Recognition and registration aspects:** Is there a registration of experts? Have the certificates a limited validity?
- **Mutual recognition aspects:** Is there a legal provision for mutual recognition? What are the barriers for mutual recognition?
- **Discussion platform aspects:** Is there a need for a discussion platform? What is its role? Is there interest to participate?

Backed-up by a guideline how to answer the questionnaire, this structure allowed easy processing of answers into the database.

### 4.1 Topics

First of all, it is important to know whether the BSS has been implemented in the national legal system or not. Implementation means the legal basis of the QE. If so, more questions were asked about the QE, such as education and training, recognition, mutual recognition of foreign QEs, and so on. If not, the same questions were asked but instead of “QE” the term “RPE” is used, referring to the national definition of the expert.

About one third of the questions addresses education and training of the RPE, also in relation to the sector of work in radiation protection. These questions also deal with knowledge and training, one of the two key points in the definition of the QE in the BSS.

About a quarter of the questions addresses recognition, the other key point in the definition of the QE. It addresses also mutual recognition of foreign RPEs.

Two questions are about the establishment of an European Discussion Platform. It addresses the need for such a platform and the interest in participating in it.

In Table 1 an overview of the different topics of the questionnaire is given, together with the number of questions involved for this topic and their relation with the objectives of the study.

Table 1 Topics addressed in the questionnaire, the number of questions and their relation with the objectives of the study

Topic	Questions	Objective
Council Directive 96/29/Euratom	1-3	1
Legal basis of the RPE	4-9	1
Education and Training	10-21	3
Recognition, registration and certification	22-27	1/2/3
Mutual Recognition	28-30	2
Discussion Platform	31-32	4
Finally	33	-

The number in the column "Objective" refers to section 1.3:

1. To survey the present situation of the radiation protection experts in all Member States and Applicant Countries
2. To identify the needs, requirements and procedures to move towards the mutual recognition of “qualified experts” in the context of the European single market and enlargement process.
3. To review the current strategy on training and education in the field of radiation protection.
4. To encourage the establishment of a “discussion platform” at a European level for the exchange of information on education and training relating to radiation protection

## 4.2 Annexes

The Annexes 1 and 2 of Appendix A are forms for answering questions 7 and 9. These questions are specifications of the questions 6 ("Are there different levels or classifications of radiation protection experts recognised in your country with regard to the complexity of the radiation applications, e.g. one simple X-ray machine or sealed source versus an institute with a number of different X-ray machines and/or open sources?") and 8 ("Are there different types of radiation protection experts recognised in your country with regard to the field of work, e.g. nuclear power plants, fuel cycle, accelerators, medical applications, general industry, mobile sources, and research?"). They make a distinction between different types of RPEs, based on the level of expertise and the sector of work. These areas are: Nuclear Power Plants, Fuel Cycle, Accelerators, Medical Applications, General Industry, Mobile Sources, and Research.

## 5 Responses and set-up of the analysis

The questionnaires and accompanying letters to the different contact points were sent in July 2001. For the Netherlands, the questionnaire was filled out by NRG and the authorities were asked to check the answers. The initial response, however, was very disappointing. The number of responses in October 2001 was still very low (4: Latvia, Romania, Hungary, and UK). It was decided to send a reminder and also address the members of the Art. 31 Group of Experts of the different EU-countries by sending them the questionnaire and ask their support, assuming that they would recognise its importance. This was done in October 2001. A further appeal was made during the Art. 31 Expert Group Meeting in November 2001. This resulted in responses from a number of other countries, leading to a total of 13 received questionnaires at the end of January 2002.

An interim report [6] was submitted to the Commission in January 2002. This was discussed in February 2002 in Brussels on a meeting of the WPET. The response at that time was still only 50%. It was decided that, before starting with the preparation of the final report, another reminder should be send. This resulted finally in a total of 15 (100%) responses from the EU Member States and 7 (54%) responses from the Applicant Countries. An overview of the responses and the date of receipt is given in table 2.

Table 2 Overview of questionnaires received (country and date of receipt)

EU Member State	Date	Applicant Country	Date
United Kingdom	29 October 2001	Latvia	23 August 2001
Sweden	22 November 2001	Romania	23 August 2001
Finland	4 December 2001	Hungary	3 September 2001
Italy	20 December 2001	Estonia	12 November 2001
Ireland	8 January 2002	Malta	28 December 2001
Luxembourg	14 January 2002	Czech Republic	23 January 2002
Greece	25 January 2002	Poland	8 April 2002
The Netherlands	5 February 2002	Bulgaria	not received
Austria	21 February 2002	Cyprus	not received
Portugal	22 February 2002	Lithuania	not received
Denmark	14 March 2002	Slovak Republic	not received
Belgium	18 March 2002	Slovenia	not received
Germany	19 March 2002	Turkey	not received
France	29 April 2002		
Spain	3 May 2002		

One reason for the delayed responses might be that apparently the questionnaire wasn't easy to answer, although help was offered in the accompanying letters. Secondly, the persons who were addressed in the first round might have experienced difficulties in finding the right people in their countries to answer the questionnaire. In this respect, it is interesting to note that there was not

much difference in the response rate of Applicant Countries that received the questionnaire through the presidents of the national radiological protection society and those that received the questionnaire through the list of contact points of the Commission. Seven of the 13 Applicant Countries have a radiological protection society that is associated to IRPA (Czech Republic, Hungary, Lithuania, Poland, Romania, Slovak Republic and Slovenia). Four of the 7 responses came from these countries. From the 6 Applicant Countries without a radiological protection society, 3 have responded.

A third reason for the delayed response might be that a number of countries were in the process of renewing their regulations. This holds true for the Member States of the European Union, who were just in the process of implementing the BSS in their national regulations. They might have deliberately delayed their response in order to give the right answers when the issues related to RPEs were clear.

It is believed that the final score resulted in a comprehensive overview of the present situation of the RPE, not only in the Member States but also in the Applicant Countries. The delayed response caused a delay in the original time schedule of the project of about 5 months.

The analysis of the responses is carried out as mentioned in chapter 4 of this report, by clustering the questions on a certain topic and analysing the results for the EU Member States and for the Applicant Countries separately. The results are presented in the chapters 6 to 11. Overall conclusions are presented in chapter 12.

## **6 The legal basis of the Radiation Protection Expert**

The implementation of the BSS in national legislation means, in principle, also the implementation of a QE requirement. Thus, it can be expected that the legal framework is the fundamental basis for provisions related to education, training and recognition of the QE.

### **6.1 EU Member States**

All fifteen EU-countries have legislation about the QE or RPE. Except for Portugal, this legislation is operational and therefore provides the legal basis of the QE or RPE. The definition of the QE or RPE implemented in each country's legal system is the same or more or less the same as the definition of a QE in the Directive. The answers on questions 1 to 5 of the questionnaire are given in summary in Table 3. Detailed information about the provisions relating to the QE in national legislation can be found in the Annexes 1 and 2 of the separate report containing the full responses on the questionnaire.

**Table 3 BSS (questions 1 - 3) and Legal basis of the Radiation Protection Expert (questions 4 - 5)**

1. *Are the provisions relating to qualified experts in the 1996 Basic Safety Standards 96/29/Euratom already implemented in your country's legal system?*
2. *If yes, can you describe how these provisions are interpreted and implemented? (Please provide us with published documentation, if possible in English)*
3. *If no, when is implementation scheduled?*
4. *Specify which piece(s) of legislation provide the current legal basis for the radiation protection expert. Please provide a copy of the relevant text, preferably in English if available.*
5. *If the provisions relating to qualified experts in the Council Directive 96/29/Euratom are not yet implemented, are the current definition(s) of a radiation protection expert in your country's law the same as or equal to that of the qualified expert in the Council Directive 96/29/Euratom?*

<b>Country</b>	<b>Question 1</b>	<b>3</b>	<b>5</b>
Austria	Yes	Some minor amendments to the existing legal provisions are scheduled for 2002	Yes
Belgium	Yes		
Denmark	Yes		
Finland	Yes		
France	Not yet (coming soon)	Not officially announced	We don't use now the European definition, but a closely related one
Germany	Yes		Yes, but there are two types or QEs: - Radiation Protection Officer - Independent Expert
Greece	Yes		
Italy	Yes		Not applicable
Ireland	Yes		Not applicable
Luxembourg	Yes		
The Netherlands	Yes	1-3-2002	Yes
Portugal	No	Not officially announced	No
Spain	Yes		
Sweden	Yes		
United Kingdom	Yes (for the vast majority of QEs)	Approximately 6 months in relation to RSA93	Not applicable

Question	Score (%)				
	Yes	In some cases	No	Other	No answer
Question 1	87	0	13	0	0
Question 5	20	0	7	27	47

## 6.2 Applicant Countries

All seven responding Applicant Countries have legislation about the QE or RPE, although not always officially as it is in a draft form (Malta) or is yet to come (Romania). The results are presented in table 4.

Table 4 BSS (questions 1 - 3) and Legal basis of the Radiation Protection Expert (questions 4 - 5)

1. Are the provisions relating to qualified experts in the 1996 Basic Safety Standards 96/29/Euratom already implemented in your country's legal system?
2. If yes, can you describe how these provisions are interpreted and implemented? (Please provide us with published documentation, if possible in English)
3. If no, when is implementation scheduled?
4. Specify which piece(s) of legislation provide the current legal basis for the radiation protection expert. Please provide a copy of the relevant text, preferably in English if available.
5. If the provisions relating to qualified experts in the Council Directive 96/29/Euratom are not yet implemented, are the current definition(s) of a radiation protection expert in your country's law the same as or equal to that of the qualified expert in the Council Directive 96/29/Euratom?

Country	Question 1	3	5
Czech Republic	Yes	Act No. 13/2002, July 1, 2002	No, in the Czech legislation the precise definition of qualified expert isn't given.
Estonia	No	Approximately in 2003	No, a radiation protection expert is not defined in the national legislation yet
Hungary	Yes		No, The differences are described in point 2
Latvia	Yes		No, but in the new Regulations on Protection against Ionising Radiation this job supervisor will be defined as job manager (qualified expert)
Malta	No	Approx. 3rd quarter of 2002	No, there is no current definition.
Poland	Yes		
Romania	Yes		Yes

Question	Score (%)				
	Yes	<i>In some cases</i>	No	<i>Other</i>	<i>No answer</i>
Question 1	71	0	29	0	0
Question 5	14	0	71	0	14

### 6.3 Conclusions

- All EU Member States, except Portugal, have implemented the provisions of the BSS related to the QE in their national regulations, or will do so in the very near future.
- All Member States, except Portugal, use definitions of an RPE that are close to the definition of the QE in the BSS.
- Five of the 7 responding Applicant Countries claim to have implemented the provisions of the BSS related to the QE in their national regulations. Two (Estonia and Malta) will do so in the very near future.
- In contrast, only Romania claims that the definition of the RPE in their regulations is the same as or equal to the definition of the QE. In most Applicant Countries, there is no clear definition of the RPE.

## **7 The level and classification of Radiation Protection Experts**

In most Member States different subdivisions of RPEs exist. The subdivision can be based on the level of complexity, or risk, of the practice. For example, a simple practice, such as an X-ray machine used by a dentist, might need another type of RPE than a research institute with a number of X-ray diffraction machines, or a hospital with diagnostic and therapeutic X-ray machines and accelerators. For this report, a subdivision of RPEs according to this type is referred to as subdivision in “levels”.

A subdivision of RPEs with respect to the area of work is also possible. An RPE working in the medical sector might be different from one working in the nuclear sector or in an industry dealing with naturally occurring radioactive materials. For this report, a subdivision of RPEs according to this type is referred to as subdivision in “classifications”.

Also a combination of both systems is possible. This leads to a kind of matrix structure.

An RPE, or QE, classified for instance for the nuclear sector may or may not be recognised as RPE for another sector. When subdivision in levels exist, it is questionable whether persons educated to the lower levels of expertise can be regarded as RPE or QE. Such persons are often described as Radiation Protection Officers, but it is difficult to draw the line between the RPE and the RPO.

In this chapter the term RPE is used as it includes both the "old" and the "new" (i.e. the implementation of the QE according to the BSS) regulatory situation.

### **7.1 EU Member States**

In the EU Member States subdivision in levels and in classifications of RPEs exist. Sometimes it even is a combination of these two subdivisions. Often a distinction is made between experts in the medical sector, the nuclear industry and the rest.

A crucial point is the prior education of the RPE. In most EU countries academic education is needed. Depending on the regulatory framework, this means that for "small" practices either a well-educated expert is needed or the practice does not require an RPE. In some countries a so called Radiation Protection Officer (RPO) fulfils the regulatory duties instead.

Below follows a short description per Member State derived from the information given in Annex 1 and 2 of the separate report containing the full responses on the questionnaire. For most countries an overview of the classification of RPEs is given. In this "matrix" of different fields of work and different levels of expertise the operational combinations of field of work and level of expertise are marked with "X".

**Austria:** Two levels of expertise are defined, A and B, but a differentiation has been made between the medical sector, non-medical sector and nuclear installations. The duration of the radiation protection course and the professional experience needed depend on the field of work.

Level of expertise	Sectors of work		
	<i>Medical sector</i>	<i>Non medical applications</i>	<i>Nuclear sector</i>
<i>Category A</i>	X	X	X
<i>Category B</i>	X	X	X

**Belgium:** Three levels of expertise (class 1 - 3) exist, of which class three will disappear in the future. Both remaining classes need academic prior education and 3 years of professional experience. No information has been given about different sectors of work.

Level of expertise	Sectors of work
	<i>Not specified</i>
<i>Class 1</i>	X
<i>Class 2</i>	X
<i>(Class 3)</i>	(X)

**Denmark:** Three sectors of work are defined: radiography, sealed and unsealed sources etc. and the medical sector. For the first two practices prior education is not specified and the radiation protection course last one week or less. Professional experience is needed though. In these sectors, experts are connected to the licence and the licence holder is responsible. In the medical sector academic education (or equivalent) is requested, including graduate and post-graduate training.

Level of expertise	Sectors of work		
	<i>Radiography</i>	<i>Sealed &amp; unsealed sources</i>	<i>Medical sector</i>
<i>Academic</i>			X
<i>Other</i>	X	X	

**Finland:** Distinction is made between a radiation safety officer (RSO) and a QE. The RSO is responsible for the safe use of radiation sources and needs academic education in the applicable sector (medical diagnosis or treatment; veterinary diagnosis or treatment/research and teaching/trade in and maintenance of radiation sources; nuclear installations and nuclear power plants). The QE is a person who has a certain expertise according to the BSS and is needed in three sectors of work: radiotherapy; nuclear medicine; nuclear installations and nuclear power plants). Both the RSO and the QE need professional experience in special cases, e.g. at nuclear installations, research centres, radiotherapy centres and sophisticated departments of nuclear medicine.

Level of expertise	Sectors of work		
	<i>General industry, research</i>	<i>Medical sector</i>	<i>Nuclear sector</i>
<i>Academic (RSO)</i>	X	X	X
<i>Specific expertise (QE)</i>		X	X

**France:** The legal framework will change in the second half of 2002. Up to now 5 different sectors of work are defined:

- Medical sector, sealed sources and generators;
- Medical sector, unsealed sources;
- Industrial sector (excluding nuclear sector), sealed sources and generators;
- Industrial sector (excluding nuclear sector), unsealed sources;
- Nuclear sector.

After passing an exam, one becomes a 'personne compétente'. In several cases special prior education is needed: physicist in radiotherapy, doctor in nuclear medicine, radiology, industrial radiography and drivers of ADR-transports. No details about training in the nuclear field are given.

Level of expertise	Sectors of work				
	<i>General industry</i>		<i>Medical sector</i>		<i>Nuclear sector</i>
	Sealed sources & generators	Unsealed sources	Sealed sources & generators	Unsealed sources	
<i>Personne compétente</i>	X	X	X	X	X

**Germany:** Expert knowledge is requested according to the X-ray ordinance for eight different types and/or purposes of the X-ray equipment. Duration of the radiation protection course is 8, 16, 32 or 40 hours, depending on this classification. Professional experience of 0, 6, 12 or 18 months is requested, depending on the type and purpose of the X-ray equipment, the education and the specific task (i.e. supervising or performing the work).

No information about the nuclear sector or the use of radiation sources has been given.

Level of expertise	Sectors of work		
	<i>Use of X-ray equipment</i>	<i>Medical sector</i>	<i>Nuclear sector</i>
<i>RPO</i>	X		
<i>Independent expert</i>			

**Greece:** A differentiation has been made according to the complexity of the practice and to the sector of work as well, although there is a connection between them:

- QE Advisor in Radiation Protection - Advisor of the government;

- QE in Radiation Protection Program - Can work in every sector, but for the medical sector medical physics as a prior education is needed;
- QE in the non-medical fields - all non-medical fields;
- Medical Radiation Physicist - medical sector;
- QE in radiation source safety - all non-medical fields.

Experience is needed, for the advisor at least 10 years. Except for the advisor and the Medical Radiation Physicist (presumably, this is the Medical Physics Expert according to Directive Euratom/97/43) approval of the expert is needed by the Greek Atomic Energy Commission. The Commission can also demand specific additional training.

Level of expertise	Sectors of work		
	<i>Government advisor</i>	<i>Medical sector</i>	<i>Non-medical sector</i>
<i>QE advisor in Radiation Protection</i>	X		
<i>QE in Radiological Protection Program</i>		X	X
<i>QE in non - medical fields</i>			X
<i>Medical Radiation Physicist</i>		X	
<i>QE in radiation source safety</i>			X

**Italy:** Three levels of expertise are defined, regarding the complexity of the practice:

- Level 1: X-ray generator (HV < 400 kV);
- Level 2: = Level 1 + electron (energy range 0,4 - 10 MeV) and neutron (< 10<sup>4</sup> n/s) generators, radioactive sources;
- Level 3 = Level 2 + nuclear facilities, large radioactive sources e.g. used in medical therapy, industrial sterilisation.

Level 1 and 2 need an university degree, level 3 an university doctorate, but no radiation protection courses are required. These are optional. All levels needs at least a professional experience of 120 working days on the job training, but specific courses are accepted as an alternative. In Italy one can become a QE only if one passes the examination of the Ministry of Labour. For the Italian authorities the education and professional experience mentioned above are minimum requirements for participating in the QE examination.

Level of expertise	Sectors of work		
	<i>X-ray generators (&lt; 400 kV)</i>	<i>Accelerators</i>	<i>High risk sources</i>
<i>Level 1</i>	X		
<i>Level 2</i>	X	X	
<i>Level 3 (highest)</i>	X	X	X

**Ireland:** Two categories of Radiation Protection Adviser (RPA) are defined:

Category 1: RPA for medicine, dentistry, chiropractic and veterinary medicine;

Category 2: RPA for industrial, educational and all other purposes.

The RPA needs to have a degree or equivalent in a physical science, or a suitable combination of other qualifications and experience. As additional training a program based on the topics of the basic Syllabus is required. A category 1 RPA needs the equivalent of seven years full-time experience in a post directly concerned with radiation protection practice. For category 2 this is three years.

Level of expertise	Sectors of work	
	<i>Industry, education, other purposes</i>	<i>Medical sector</i>
<i>Category 1</i>		X
<i>Category 2</i>	X	

**Luxembourg:** QEs are educated and trained in other Member States of the EU.

**The Netherlands:** There are five levels of expertise defined in the Radiation Protection Decree with regard to the level of complexity of the practice. Level 1, the highest level, is called the internationally recognised expert, but there are no requirements specified. Therefore, it is not operational. For the level 2 expert, academic or equivalent prior education is needed, since the expert has to deal with complex and multiple practices with sealed and unsealed sources and generators. For levels 3, 4 and 5 higher, moderate and lower education after secondary school is needed. There is no subdivision in sectors of work, but there is a division in the education to levels 4 and 5. Level 4A and 5A deal with sealed sources and X-ray equipment, level 4B and 5B deal with unsealed sources. Courses and exams have to be organised by recognised training centres. The certificate allows for a job in all sectors of work, since the only criterion for recognition of the expert by the authorities is the certificate of a recognised training centre. At the moment, there are no requirements for professional experience. This may change in the near future, since a system of registration of RPEs is being developed (see chapter 9).

Level of expertise	Sectors of work		
	<i>All sectors (all sources)</i>	<i>All sectors (sealed sources; X-ray machines)</i>	<i>All sectors (open sources)</i>
<i>Level 1 (highest)</i>			
<i>Level 2</i>	X		
<i>Level 3</i>	X		
<i>Level 4</i>		X (4A)	X (4B)
<i>Level 5 (lowest)</i>		X (5A)	X (5B)

**Portugal:** no information

**Spain:** no information

**Sweden:** There are five sectors of work defined:

- Open sources;
- Radiography;
- Accelerators and sealed sources;
- Medical sector;
- Nuclear power plants.

The last two sectors need an academic or equivalent education and all sectors need professional experience. Additional radiation protection training in the medical sector is included in the process of legislation. In other sectors, it is decided on a case to case basis who is an expert for each licence. The licence holder is responsible.

Level of expertise	Sectors of work				
	<i>Open sources</i>	<i>Radiography</i>	<i>Accelerators &amp; sealed sources</i>	<i>Medical sector</i>	<i>Nuclear sector</i>
<i>Academic</i>				X	X
<i>Other</i>	X	X	X		

**UK:** The main radiation protection expert in the UK legislation is the radiation protection adviser (RPA). It is defined in the Ionising Radiations Regulations 1999 (IRR99) as an individual who, or a body which, meets the Health and Safety Executive (HSE)'s criteria of competence. These have been laid down in the HSE Statement on RPAs.

Under the Radioactive Substances Act 1993 (RSA93), both the Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA) have been developing criteria for appointment

and recognition of QEs for RSA93 authorisations and intend to implement these in approximately 6 months. Both agencies are placing appropriate conditions in authorisations for disposal of radioactive waste under RSA93. For example, EA's standard authorisation condition requires: 'The Operator shall have a management system, organisational structure and resources which are sufficient to achieve compliance with the limitations and conditions of this authorisation and which include provision for consultation with such suitable radiation protection advisers or such other QEs recognised by the Agency for the purpose of advising on compliance with the limitations and conditions of this authorisation.'

Level of expertise	Sectors of work
	<i>Unspecified</i>
<i>RPA</i>	X

In Table 5 a summary of the different levels or classifications of RPEs in EU Member States can be found.

**Table 5 Levels and Classifications of Radiation Protection Experts (questions 6-9) in the EU Member States**

6. *Are there different levels or classifications of radiation protection experts recognised in your country with regard to the complexity of the radiation applications, e.g. one simple X-ray machine or sealed source versus an institute with a number of different X-ray machines and/or open sources?*
7. *If yes, please specify these different levels in terms of prior education, duration of the course, et cetera*
8. *Are there different types of radiation protection experts recognised in your country with regard to the field of work, e.g. nuclear power plants, fuel cycle, accelerators, medical applications, general industry, mobile sources, and research?*
9. *If yes, please specify these different levels in terms of prior education, duration of the course, et cetera*

<b>Country</b>	<b>6</b>	<b>8</b>
Austria	Levels of Expertise are: main responsible experts (designated in Annex as A) and additional experts (designated in Annex as B) For the Austrian situation a combination of Annexes 1 and 2 seems more appropriate	Yes, see Annex
Belgium	Mixed system (see annex 1)	Mixed system (see annex 1)
Denmark	Depends on the area of practice in question	Depends on the area of practice in question
Finland	Yes	Yes
France	In the non-nuclear field, there is only one level the "personne competente", but four possibilities of training	No, there are different kinds of specialists, for example in the medical field
Germany	Yes	Yes
Greece	Yes	Yes
Italy	Yes	No
Ireland	No	Yes
Luxembourg	Yes	Yes
the Netherlands	Yes, there are 5 different levels defined, but the highest level of expertise is not operational; in practice there are 4 levels (level 2 to level 5)	No, but there are deviations: Expert levels 4 and 5 are split for use of only sealed sources (level 5A and 4A) and open sources (level 5B and 4B) and there are special levels which focus on the expert in the medical field
Portugal	No	No
Spain	No, the different classification are a matter of responsibility between the specialists and the head of service	No, but the title is specific for a practice or activity

### **Levels and Classifications of Radiation Protection Experts (questions 6-9) in the EU Member States**

6. *Are there different levels or classifications of radiation protection experts recognised in your country with regard to the complexity of the radiation applications, e.g. one simple X-ray machine or sealed source versus an institute with a number of different X-ray machines and/or open sources?*
7. *If yes, please specify these different levels in terms of prior education, duration of the course, et cetera*
8. *Are there different types of radiation protection experts recognised in your country with regard to the field of work, e.g. nuclear power plants, fuel cycle, accelerators, medical applications, general industry, mobile sources, and research?*
9. *If yes, please specify these different levels in terms of prior education, duration of the course, et cetera*

<b>Country</b>	<b>6</b>	<b>8</b>
Sweden	Yes	Yes
United Kingdom	No	Yes, different experts may advise on compliance with Article 47 of the Directive: RPAs deal with radiation health effect under IRR99, whilst QEs under RSA93 deal with environmental protection

<b>Question</b>	<b>Score (%)</b>				
	<i>Yes</i>	<i>In some cases</i>	<i>No</i>	<i>Other</i>	<i>No answer</i>
Question 6	47	0	27	27	0
Question 8	53	0	33	0	13

### **7.2 Applicant Countries**

In the Czech Republic and Hungary different levels and classifications of RPEs exist, based on the complexity of the practice, but also on the sector of work. In Latvia, Poland and Romania different classifications of RPEs exist, based on the sector of work only.

**Czech Republic:** Four levels of expertise are defined, levels 1 to 4, based on the complexity of the practice:

- Level 1: supervision of sources with a high risk level such as reactors;
- Level 2: supervision of important sources for medical exposures with intermediate risk level
- Level 3: management of tests and services with intermediate risk levels, all sectors;
- Level 4: all other activities with a low risk level, all sectors.

Levels 1 and 2 need a university degree as prior education, levels 3 and 4 secondary education. Duration of the radiation protection course is 1 week for levels 1, 2 and 3. For level 4 a course is not necessary. Experts of all levels need to pass an exam before the Commission of the Office and 1 year of professional experience.

Level of expertise	Sectors of work		
	<i>All sectors</i>	<i>Medical sector</i>	<i>Nuclear sector</i>
<i>Level 1 (highest)</i>			X
<i>Level 2</i>		X	
<i>Level 3</i>	X		
<i>Level 4 (lowest)</i>	X		

**Estonia:** no information was given

**Hungary:** Three levels of expertise are distinguished:

- Comprehensive level: complex practices - university degree - at least 40 hours of a radiation protection course - 5 to 10 years professional experience;
- Extended level - responsible for single practices - at least secondary school - at least 26 hours of a radiation protection course;
- Basic level - auxiliary work - at least 8 hours of a radiation protection course.

In the medical sector, the nuclear sector and in research and industry experts need the extended or comprehensive level, depending on their responsibilities.

Level of expertise	Sectors of work		
	<i>General industry, research</i>	<i>Medical sector</i>	<i>Nuclear sector</i>
<i>Comprehensive</i>	X	X	X
<i>Extended</i>	X	X	X
<i>Basic</i>		X	X

**Latvia:** Three types of work field as distinguished:

- General industry, research;
- Medical applications;
- Dentistry.

Medical applications and dentistry need higher medical education and a certificate of diagnostic radiologist speciality or dentist speciality respectively. For the general industry and research accredited higher technical education is required and as an additional training a higher or secondary post-graduate education programme in the field of radiation safety and nuclear safety is requested.

Level of expertise	Sectors of work		
	<i>General industry, research</i>	<i>Medical applications</i>	<i>Dentistry</i>
<i>Higher technical education</i>	X		
<i>Higher medical education</i>		X	X

**Malta:** There is no current definition of a QE and no education program. Probably, medical physicists, specially trained in radiation protection shall be considered as qualified experts in terms of the BSS. Therefore, no different levels or different types of QEs exist to date.

**Poland:** Three types of experts are defined according to the sector of work. Furthermore, a very detailed scheme exists of different practices and their demands of prior education, professional experience, duration of the course etc.

Level of expertise	Sectors of work		
	<i>General industry, research</i>	<i>Medical sector</i>	<i>Nuclear sector</i>
<i>General</i>	X	X	X

**Romania:** The authorities have yet to establish specific criteria and rules.

Table 6 gives a summary of the different levels or classifications of RPEs in Applicant Countries.

**Table 6** Levels and Classifications of Radiation Protection Experts (questions 6-9) in the Applicant Countries

6. *Are there different levels or classifications of radiation protection experts recognised in your country with regard to the complexity of the radiation applications, e.g. one simple X-ray machine or sealed source versus an institute with a number of different X-ray machines and/or open sources?*
7. *If yes, please specify these different levels in terms of prior education, duration of the course, et cetera*
8. *Are there different types of radiation protection experts recognised in your country with regard to the field of work, e.g. nuclear power plants, fuel cycle, accelerators, medical applications, general industry, mobile sources, and research?*
9. *If yes, please specify these different levels in terms of prior education, duration of the course, et cetera*

Country	6	8
Czech Republic	Yes	Yes
Estonia	No, not established	No
Hungary	Yes	Yes
Latvia	No	Yes, there are different types of radiation experts (job managers) recognised with regard to the field of work (medical applications, industry, research), but there are not different levels of radiation protection experts in Latvia
Malta	No	No
Poland	No	Yes
Romania	No	Yes

Question	Score (%)				
	Yes	<i>In some cases</i>	No	<i>Other</i>	<i>No answer</i>
Question 6	29	0	71	0	0
Question 8	71	0	29	0	0

### 7.3 Conclusions

- Most of the EU Member States make a distinction in RPEs, according to both the level of expertise and the sector of work. Italy and the Netherlands make only a distinction based on the level of expertise. Ireland and the United Kingdom make only a distinction based on the sector of work. There is no information about the system of subdivision from Portugal and Spain.
- From the 7 responding Applicant Countries, the Czech Republic and Hungary make a distinction in RPEs, according to both the level of expertise and the sector of work. Three countries (Latvia, Poland and Romania) make only a distinction based on the sector of work, although the criteria and rules have yet to be established in Romania. Two countries (Estonia and Malta) don't use subdivision.
- In most cases, and both for EU Member States and Applicant Countries, subdivision based on the sector of work makes a distinction between the medical sector, the nuclear sector and the rest of the practices.

## **8 Education and training**

The questions 10 to 21 refer to the education and training systems in the various countries. The questions are repeated below. In the sections 8.1 and 8.2 a summary of the results of the responses is given for the EU Member States and the Applicant Countries, respectively. The detailed responses can be found in the separate report.

### **8.1 EU Member States**

10. In many countries university degrees are needed prior to the education of an RPE or QE. Therefore, many universities provide the courses for the experts, but also special training centres.
11. The training centres are recognised by the government or special governmental institutes in Belgium, Finland, Greece, the Netherlands and Spain. In Denmark, France, Germany, Italy, Ireland and Sweden recognition is only necessary in specific cases, for instance in the medical sector.
12. Continuous training is implemented in the legislation of Belgium, Germany, Greece, Ireland, Spain and the UK. In Denmark, France, Italy and Sweden only in some cases, often connected to medical use of radiation.
13. In most countries training programmes address the topics mentioned in the basic Syllabus. Exceptions are Belgium and Ireland (and Luxembourg, but this country offers no courses). If a distinction in experts is made according to the sector of work, only that part of the Syllabus might be addressed.
14. Except for Ireland and Portugal (and Luxembourg, but this country offers no courses) practical work is part of the training programme, although requirements are not necessarily specified.
15. Except for Portugal, the Netherlands and Luxembourg, professional experience is needed to become an expert. In some countries, including the Netherlands, the system is in revision and with regard to registration of experts professional experience must be proved for re-registration.
- 16/17. In about half of the EU Member States the current education system is, according to the opinion of the responders, sufficient to become a QE as defined in the BSS. The expert described in Italian legislation can become a QE only after passing the examination prescribed by the Ministry of Labour. In Spain also additional training is required and it depends on the level of the expert. In Ireland one needs 3 or 7 years of experience before becoming a QE. This is not part of recognised training courses. In the UK some further degrees (e.g. MSc in environmental and radiation protection) may provide a substantial basis for the training requirements of Radiation Protection Advisers (RPA). One can only be recognised as an RPA when either a level 4 National or Scottish Vocational Qualification in Radiation Protection

Practice is obtained, or a valid certificate of core competence is issued by an organisation recognised as an assessing body by HSE. In Germany and Denmark only in some cases education is sufficient to meet the QE definition of the BSS.

18/19. The education and training programme of Luxembourg is part of the programmes of neighbouring countries (and also supported by them). In France the ERPC (European Radiation Protection Course), the ESNM (European School of Nuclear medicine) and the ERC (European Radiopharmacy Course) are operational, and open for all European countries. International bodies, such as IAEA and EANM (European Association of Nuclear Medicine) also support these programmes. All other countries responded with “no”, although in Belgium a common education and training programme is in preparation.

20. The major institutes in the seven responding Applicant Countries for education and training of RPEs can be found in the separate report containing the full responses on the questionnaire.

21. Except in Denmark, Ireland and the Netherlands there is input, or feedback, from the users of ionising radiation (such as employers, unions, and professional bodies) with regard to the needs and efficiency of the education and training program in the EU Member States. This is not always formalised and sometimes restricted to the medical field only.

An overview of the summarised data is given in Table 7. Detailed information can be found in the separate report containing the full responses on the questionnaire.

**Table 7 Education and training of Radiation Protection Experts (questions 10-21) in the EU Member States**

10. Please indicate which of the following bodies provide initial education and training for radiation protection experts. Specify whether these bodies are legally recognised with respect to their radiation protection training courses.

11. Is there an exam to pass in the education and training necessary to become a radiation protection expert? Specify for which levels of expertise, if there is a difference.

12. Are there any provisions to ensure the continuing education and training, e.g. by refresher courses?

13. In Annex 1 of Commission Communication C 133/12 (Official Journal of the European Communities of 30 April 1998), a basic syllabus for the qualified expert in radiation protection is published, together with recommended additional topics for five specific areas, i.e. nuclear installations, general industry, research and training, medical applications and accelerators. A copy of this Communication is added to this questionnaire. Are all topics addressed in your training program(s)? Indicate the number of hours dedicated to each topic for the different types of expert in your country. Please also specify if certain topics are only addressed in training courses for specific radiation protection experts.

14. Is any practical work, or exercises, part of the training program?

15. Is professional experience necessary to become a radiation protection expert in your country?

16. Is your education system sufficient to become a qualified expert as defined in the Council Directive 96/29/Euratom? Please specify your answer.

17. If no, what are the conditions to become a qualified expert as defined in the Council Directive 96/29/Euratom?

18. Is your country's education and training programme part of a common education and training programme for some countries in a certain region of Europe?

19. Is your country's education and training programme supported by another country or an international organisation, such as IAEA?

20. Please list the major institutes in your country for education and training of radiation protection experts.

21. Is there any input, or feedback, from the users of ionising radiation (such as employers, unions, professional bodies) with regard to the needs and efficiency of the education and training program in your country?

Country	Question 11	12	14	15	16	18	19	21
Austria	No formal requirement, but general practice	Not yet	Yes	Yes	Yes	No	No	Yes, via working groups
Belgium	Yes	Yes	Yes	Yes, 3 years	Yes	No (in preparation)		Yes, but not institutionalised
Denmark	In some cases	In some cases	Yes, in most areas	Yes, in some areas	In some cases	No	No	No
Finland	Yes	In some cases (medical sector)	Yes, for hospital physicist	Yes, not defined in years	Yes	Not yet	No	Yes

Country	Question 11	12	14	15	16	18	19	21
France	In some case for the "personne competente"	In some cases (industrial gammagraphy, truck drivers for radioactive transport)	Yes, 50% for ERPC	Yes, for experts of the ERPC	Yes	Yes	Yes	Yes, via professional associations
Germany	In some cases	Yes	Yes	Yes (in revision)	In some cases)	No	No	Yes
Greece	Yes	Yes	Yes, 1 year in the Medical Sector	Yes, up to 10 years	Yes	No	No	Yes, for the Medical Radiation Physicists
Italy	In some cases	No legal provisions, but in some cases company initiative	Yes	Yes, for those candidates for the Ministerial examination who lack certificates from specific training courses	No, it is sufficient just for the Ministerial entrance examination	No	No	Yes, via professional associations
Ireland	In some cases	Yes, to renew approval	No	Yes, up to 7 years	No, professional experience is required	No	No	No

Country	Question 11	12	14	15	16	18	19	21
Luxembourg	Yes, courses offered by other Member states	No	Not applicable	No	Not applicable	Not applicable	Not applicable	Not applicable
The Netherlands	Yes	No	Yes, 20% of the course	No, not yet	Yes, there are different levels of expertise	No	No	No
Portugal	There are no legally recognised bodies for education and training of RPEs							
Spain	Yes, for the becoming Head of a Radiation Protection Service	Yes	Yes	Yes, depending on the complexity of the facility	No, additional training is necessary	No	No	Yes
Sweden	In some cases (medical sector)	In some cases (medical sector)	Yes	Yes, different from case to case	Yes	No	No	Yes, employee's union in the medical sector, for others e.g. professional bodies
United Kingdom	No, RPAs must meet the criteria of competence	Yes, to renew certification	Yes, although courses are not legally recognised	Yes, time no longer specified, in the revised HSE Statement that came into effect on 1/12/01	No, additional training is required	No	No	Yes, via EmpNTO

Question	Score (%)				
	Yes	In some cases	No	Other	No answer
Question 11	40	40	13	7	0
Question 12	40	27	20	13	0
Question 14	80	0	7	13	0
Question 15	80	0	13	7	0
Question 16	47	13	27	13	0
Question 18	7	0	73	20	0
Question 19	7	0	73	13	7
Question 21	67	0	20	13	0

## 8.2 Applicant Countries

- 10/11. Often education and training takes place at the university, but also at other authorised centres. Normally there is an exam to pass, but in the Czech Republic only in some cases and not or not yet in Malta and Romania.
12. Continuous training is implemented in legislation in Estonia, Hungary, Latvia and Poland, but in the Czech Republic only in some cases and not or not yet in Malta and Romania.
13. In Hungary, Latvia and Poland training programmes address the topics mentioned in the basic Syllabus. If a distinction in experts is made according to the sector of work, only specific topics of that field might be addressed. The time spent per topic depends on the level of expertise of the expert (if that distinction is made).
14. In Hungary, Latvia and Poland practical work is part of the training programme, although requirements are not necessarily specified.
15. Except Estonia professional experience is needed to become an expert. In the Czech Republic 1 year of experience is needed. In Hungary 5 to 10 years, although not yet regulated. In Latvia the required professional experience depends on the level of education and ranges from 1 year for persons with a Doctor's degree in science up to 17 years for persons with special secondary education.
- 16/17. In the Czech Republic and Estonia the current education system is, according to the responders, in some cases sufficient to become a QE as defined in the BSS. In Poland, Romania and Hungary it is sufficient, apart from some minor corrections. In Latvia additional professional training is required, but the right to act as a QE is approved by the competent authorities. In Malta medical physicists specially trained in radiation protection shall be considered as QEs.
- 18/19. Except in Hungary and Poland, education and training programmes in the Applicant Countries are supported by the IAEA as a Regional Technical Co-operation Project.
20. The major institutes in the seven responding Applicant Countries for education and training of RPEs can be found in the separate report containing the full responses on the questionnaire B.
21. In the Czech Republic, Hungary, Latvia and Romania input, or feedback, from the users of ionising radiation (such as employers, unions, professional bodies) with regard to the needs and efficiency of the education and training program in the EU Member States is given. This is not always formalised and sometimes restricted to the medical field only (the Czech Republic).

An overview of the summarised data is given in Table 8. Detailed information can be found in the separate report containing the full responses on the questionnaire.

**Table 8 Education and training of Radiation Protection Experts (questions 10-21) in the Applicant Countries**

10. Please indicate which of the following bodies provide initial education and training for radiation protection experts. Specify whether these bodies are legally recognised with respect to their radiation protection training courses.
11. Is there an exam to pass in the education and training necessary to become a radiation protection expert? Specify for which levels of expertise, if there is a difference.
12. Are there any provisions to ensure the continuing education and training, e.g. by refresher courses?
13. In Annex 1 of Commission Communication C 133/12 (Official Journal of the European Communities of 30 April 1998), a basic syllabus for the qualified expert in radiation protection is published, together with recommended additional topics for five specific areas, i.e. nuclear installations, general industry, research and training, medical applications and accelerators. A copy of this Communication is added to this questionnaire. Are all topics addressed in your training program(s)? Indicate the number of hours dedicated to each topic for the different types of expert in your country. Please also specify if certain topics are only addressed in training courses for specific radiation protection experts.
14. Is any practical work, or exercises, part of the training program?
15. Is professional experience necessary to become a radiation protection expert in your country?
16. Is your education system sufficient to become a qualified expert as defined in the Council Directive 96/29/Euratom? Please specify your answer.
17. If no, what are the conditions to become a qualified expert as defined in the Council Directive 96/29/Euratom?
18. Is your country's education and training programme part of a common education and training programme for some countries in a certain region of Europe?
19. Is your country's education and training programme supported by another country or an international organisation, such as IAEA?
20. Please list the major institutes in your country for education and training of radiation protection experts.
21. Is there any input, or feedback, from the users of ionising radiation (such as employers, unions, professional bodies) with regard to the needs and efficiency of the education and training program in your country?

Country	11	12	14	15	16	18	19	21
Czech Republic	In some cases	In some cases	No	Yes, 1 year	In some cases	No	Yes, support of IAEA	Yes, in the medical sector
Estonia	Yes	Yes, for re-certification	No	No	In some cases	No	Yes, IAEA	No
Hungary	Yes	Yes, every 5 years	Yes	Yes, about 5 to 10 years, but not regulated yet	Yes	No	No	Yes

Country	11	12	14	15	16	18	19	21
Latvia	Yes	Yes, with the license renewal, every three years	Yes	Yes, up to 17 years	No, additional professional experience is required	No	Yes, IAEA	Yes, from users
Malta	No	No	No	Yes, but in discussion	No	No	Yes, IAEA	No
Poland	Yes	Yes	Yes	Yes	Yes	No	No	No
Romania	Not yet	Not yet	Not yet	Yes, probably a minimum of 3 years	Yes, with University degree	Yes	Yes, IAEA	Yes, from users

Question	Score (%)			
	Yes	In some cases	No	Other et
Question 11	57	14	14	14
Question 12	57	14	14	14
Question 14	43	0	43	14
Question 15	87	0	14	0
Question 16	43	29	29	0
Question 18	14	0	87	0
Question 19	71	0	29	0
Question 21	57	0	43	0

### **8.3 Conclusions**

- In most cases, and both for EU Member States and Applicant Countries, a prior education on an academic level is needed for the training of the RPE, certainly for the medical and the nuclear sector.
- In the majority of the countries, and both for EU Member States and Applicant Countries, training courses are given at universities, but other training centres do occur. Training programmes address in most cases the topics mentioned in the basic Syllabus. If a distinction in experts is made according to the sector of work, only part of the topics might be addressed.
- Training centres need to be recognised by the authorities in many countries, but sometimes this is only necessary in certain sectors, such as the medical sector.
- Professional experience is a criterion for recognition in many countries, but not in all. The space of time varies considerably, from zero to several years and depending on the sector of work.
- Most of the training programmes in the Applicant Countries, but not in Hungary and Poland, are supported by the IAEA. Within the EU, only Luxembourg depends on training courses given in other countries. Some courses in France are also supported by international bodies, but these courses are also open for students from other countries.
- In most of the EU Member States and in some Applicant Countries there is input, or feedback, from the users of ionising radiation (such as employers, unions, professional bodies) with regard to the needs and efficiency of the education and training program. This input, or feedback, is not always formalised. No input or feedback is given in three EU Member States (Denmark, Ireland and the Netherlands) and in four of the responding Applicant Countries (Czech Republic, Hungary, Latvia and Romania).

## **9 Recognition, registration and certification**

One of the aspects of the QE is the recognition of its capacity to act as such by the competent authorities. The recognition can be expressed formally by a system of registration or certification. Questions 22 to 26 address these issues.

In several Member States emphasis is placed on the word “capacity” in the definition of the QE. In general, the QE is recognised by a competent authority of a Member State, specifically when he has certain responsibilities or duties in radiation protection as defined in licences for practices with ionising radiation. Often recognition is based on qualifications with respect to the education of the QE. In some Member States however, the recognition is based, or will be in the near future, on a system of certification, or registration, of the capabilities of the QE. This is already implemented in the United Kingdom. There, the recognition is not only restricted to education, but also on other qualifications, such as experience and refresher courses. Other Member States are considering developing such a system, such as in the Netherlands.

### **9.1 EU Member States**

Except for Portugal, France and Denmark in some cases, the responders to the questionnaire indicate that both RPEs and QEs are formally recognised by the relevant competent authorities. In Portugal and France, the definition of the QE is not yet implemented in the national legislation.

Qualified (or radiation protection) experts are registered or certified, but the system of registration or certification has to be worked out yet in some countries. In Portugal and France there is no registration or certification and in Denmark only in some cases. Certifying bodies per country can be found in the detailed information in the Annexes.

In countries with an operational certification system time limits are set for (re)registration and/or (re)certification. In most cases this is five years. Only in some cases feedback is given by the users. In the UK this system is fully operational for some time now. It is executed by three players: Environmental Agency (EA), SEPA (Scottish Environment Protection Agency) and HSE (Health & Safety Executive).

The summary of the answers to questions 22 to 27 can be found in Table 7. The Annexes 1 and 2 of the separate report with the full responses on the questionnaire contain all the detailed information.

**Table 9 Recognition, registration and certification (questions 22 - 27) in the EU Member States**

22. *Are radiation protection experts in your country formally recognised by the relevant competent authorities?*  
 23. *Are qualified experts (in the same sense as in the definition of the Council Directive 96/29/Euratom) recognised in your country?*  
 24. *Are qualified (or radiation protection) experts registered or certified in your country?*  
 25. *If yes, please specify the system of registration or certification, including the accreditation procedures for registering or certifying bodies.*  
 26. *Are time limits set for (re)registration and/or (re)certification?*  
 27. *Is there any input, or feedback, from the users of ionising radiation (such as employers, unions, and professional bodies) with regard to the needs and efficiency of the system of recognition, registration and/or certification of qualified experts in your country?*

Country	Question 22	23	24	26	27
Austria	Yes; Qualified Radiation Protection Experts have to be notified to the licensing authority by the licence holder		Yes, by the authority competent for licensing; there is no central register		No
Belgium	Yes		Yes, registered by competent authorities, but no accreditation procedures	Yes, max 6 years	No
Denmark	Is some cases		In some cases		No
Finland	Yes, by STUK		Yes, as a part of licensing	No	No
France	We don't have yet, QE according to the European directive				
Germany	Yes		In some cases	In some cases, 5 years	No
Greece	Yes		Yes	No	Yes
Italy	Yes, Ministry of Labour		Yes	No	No
Ireland	Yes, in the new legislation		Yes, a registration system is being set up	Yes, 5 years	No
Luxembourg	Yes		Yes	No	
the Netherlands	Yes, but until now you become a RPE if you pass the examination at a recognised (approved) training institute		Yes, in the new regulations	Yes, presumably 4 years	Yes
Portugal	No		No	No	No
Spain	Yes, Head of service of Radiation Protection		Yes	No	Yes
Sweden	Yes, coupled to the licence			In some cases, 5 years	Yes
United Kingdom	Yes, see HSE statement on radiation protection advisers		Yes	Yes. HSE and EA 5; SEPA 4 years	Yes

Question	Score (%)				
	Yes	<i>In some cases</i>	No	<i>Other</i>	<i>No answer</i>
Question 22	80	7	7	7	0
Question 23	80	7	7	7	0
Question 24	73	13	7	7	0
Question 26	27	13	40	0	20
Question 27	33	0	53	0	13

## 9.2 Applicant Countries

In all seven responding Applicant Countries RPEs are formally recognised by the relevant competent authorities. QEs, in the same sense as in the definition of BSS, are also recognised, except for Hungary where the QE is only recognised in some cases, and Estonia where the recognition procedure is described in the Draft Radiation Act.

In the Czech Republic, Hungary, Poland and Romania RPEs or QEs are registered or certified. In Latvia registration occurs only in some cases. As for recognition, registration or certification in Estonia is described in the Draft Radiation Act. In Malta there is no registration or certification. The system of registration or certification can be found in detail in the Annexes 1 and 2 of the separate report containing the full responses on the questionnaire.

In countries with a certification system time limits are set for (re)registration and/or (re)certification. In most cases this is five years, but in Latvia 3 years and in Poland 3 or 5 years, depending on the level of the expert. In the Czech Republic experts working with "very important sources" need to be re-registered after 5 years, and for other sources after 10 years. Only in some cases feedback is given by the users.

Table 8 shows the summary of the results from the Applicant Countries for questions 22 to 27.

**Table 10 Recognition, registration and certification (questions 22 - 27) in the Applicant Countries**

22. *Are radiation protection experts in your country formally recognised by the relevant competent authorities?*  
 23. *Are qualified experts (in the same sense as in the definition of the Council Directive 96/29/Euratom) recognised in your country?*  
 24. *Are qualified (or radiation protection) experts registered or certified in your country?*  
 25. *If yes, please specify the system of registration or certification, including the accreditation procedures for registering or certifying bodies.*  
 26. *Are time limits set for (re)registration and/or (re)certification?*  
 27. *Is there any input, or feedback, from the users of ionising radiation (such as employers, unions, professional bodies) with regard to the needs and efficiency of the system of recognition, registration and/or certification of qualified experts in your country?*

Country	22	23	24	26	27
Czech Republic	Yes	Yes	Yes	Yes, 5 or 10 years	Yes
Estonia	Yes	No		No	No
Hungary	Yes	In some cases	Yes	Yes, 5 years	Yes
Latvia	Yes	Yes	In some cases registration	Yes, 3 years	No
Malta	Yes	Yes	No, not yet	No, not yet	No
Poland	Yes	Yes	Yes	Yes, 3 or 5. years	No
Romania	Yes	Yes	Yes, for a limited number of persons, well recognised as experts in radiation protection	Not yet decided	Yes

Question	Score (%)				
	Yes	In some cases	No	Other	No answer
Question 22	100	0	0	0	0
Question 23	71	14	14	0	0
Question 24	57	14	14	0	14
Question 26	57	0	43	0	0
Question 27	43	0	57	0	0

### 9.3 Conclusions

- In most of the EU Member States, and in all of the responding Applicant Countries, RPEs are formally recognised by the competent authorities.
- Most countries in the EU as well as from the responding Applicant countries claim that RPEs are registered or certified, but the system of registration or certification has to be worked out in several of them.

- In countries where a registration or certification system is operational, a time limit is set on the validity of the registration or certificate. In most cases this is five years, but other time periods do occur, depending on the sector of work or the level of expertise.
- Only in some cases feedback is given from the users.



## **10 Mutual recognition**

An important issue in the EU is the improvement of harmonisation between Member States. Mutual recognition of experts, including QEs in radiation protection, is part of this harmonisation. Objective no. 2 of this study, *"to identify the needs, requirements and procedures to move towards the mutual recognition of "qualified experts" in the context of the European single market and enlargement process"*, expresses this need.

The questionnaire addresses this topic in three questions. The answers on the main question ("Are radiation protection experts from other EU countries currently recognised as qualified experts in your country from a legal point of view?") show that in the vast majority of the EU-countries mutual recognition is not implemented in the legislation.

### **10.1 EU Member States**

Except for Luxembourg there is no automatic recognition of RPEs or QEs from other EU countries. In Austria, Sweden and the Netherlands recognition is performed on an individual basis by the competent authorities. Education and training in other countries is, as a rule, acknowledged but the applicant has to prove knowledge of the national radiation protection regulations. The Swedish answer shows clearly that it is necessary for the QEs to demonstrate his ability to communicate with the personnel and the authorities involved. But there are no formal provisions for mutual recognition.

Luxembourg offers no courses. Therefore it depends fully on the recognition of experts who got their education elsewhere (neighbouring Member States).

In some countries some intentions are to move towards incorporation of mutual recognition in the legal system. But this is all very premature and still informal.

Results from the questionnaire concerning mutual recognition are given in Table 9.

Table 11 Mutual Recognition of experts (questions 28- 30)

28. Are radiation protection experts from other EU countries currently recognised as qualified experts in your country from a legal point of view?

29. If yes, please specify the provisions for mutual recognition.

30. If no, are there informal arrangements or the intention to move towards a legal system?

Country	Question 28	30
Austria	Recognition is performed on an individual basis by the competent authority.	-
Belgium		The criterion “ Belgian nationality” has disappeared in the new regulation (RD 20/07/2001)
Denmark	No	No
Finland	No	No
France	No	In progress??
Germany	No	Not yet
Greece	No	
Italy	No	Yes, the AIRP promote action
Ireland	No	Yes, there is an informal system whereby QEs from other countries are recognised
Luxembourg	Yes	
the Netherlands	Occasionally, not automatically	Intention via Registration of Experts. Registration in one country should make it easier to register in another EU country
Portugal	No	No
Spain	No	
Sweden	Decided from case to case. According to 2000:6 generally academic training is needed together with practical experience. It is necessary that the expert is well acquainted with the conditions in the country and is able to communicate with the persons and authorities involved	
United Kingdom	No	There have been discussions to develop proposals for mutual recognition between the UK professional societies (e.g. the Society for Radiological Protection) and their counterparts in the EU.

Question	Score (%)				
	Yes	In some cases	No	Other	No answer
Question 28	7	13	67	0	13
Question 30	13	0	27	33	27

## 10.2 Applicant Countries

In six of the seven responding Applicant Countries there is no automatic recognition of RPEs or QEs from EU Member States or other countries. In Latvia mutual recognition is accounted for only in the case of project related experts performing IAEA or EU projects in the country. In the Czech Republic, Hungary, Malta and maybe Romania there are intentions to move towards mutual recognition incorporated in the regulatory system.

Results from the questionnaire concerning mutual recognition are given in Table 10.

Table 12 Mutual Recognition of experts (questions 28- 30)

28. *Are radiation protection experts from other EU countries currently recognised as qualified experts in your country from a legal point of view?*

29. *If yes, please specify the provisions for mutual recognition.*

30. *If no, are there informal arrangements or the intention to move towards a legal system?*

Country	Question 28	30
Czech Republic	No	Yes
Estonia	No	
Hungary	No	Yes
Latvia	Yes, radiation protection experts from other EU countries are recognised if they are involved in different IAEA or EU projects	
Malta	No	Yes
Poland	No	?
Romania	No	Not known yet

Question	Score (%)				
	Yes	In some cases	No	Other	No answer
Question 28	14	0	86	0	0
Question 30	43	0	0	14	43

## 10.3 Conclusions

- Except for Luxembourg and Latvia, all countries indicate that there is no automatic recognition of QEs or RPEs, although in some of the countries there are intentions to move towards incorporation of mutual recognition in the regulations. In some countries, recognition is performed on a case by case basis. In other countries, the expert has to prove knowledge of the national radiation protection regulations, or his communicative skills.
- To identify the needs, requirements and procedures to move towards mutual recognition, it is necessary to get information from the authorities in each Member State that recognise the

capacity of the QE. These authorities should be contacted to describe their requirements and procedures for recognition. Topics to be considered are formal examination, assessment of knowledge and experience and recognition by the regulatory body.

- The system of registration and/or certification could be the basis to come to mutual recognition. An inventory should be made of the requirements and procedures for registration and/or certification. Information should come from the registration or certifying bodies.

## 11 Discussion platform

One of the objectives of the study is "to encourage the establishment of a "discussion platform" at an European level for the exchange of information on education and training relating to radiation protection". This discussion platform may well be a necessary step to move towards mutual recognition of QE's. In the questionnaire two questions were asked about the topic of the discussion platform.

### 11.1 EU Member States

All responders, except Austria and Denmark in some cases, indicate that it is useful to establish a "discussion platform" at an European level for the exchange of information on education and training relating to radiation protection. All positively responding correspondents are interested to participate in such a platform. The results are presented in Table 11.

Table 13 Discussion Platform (questions 31 - 32)

31. Do you think it is useful to establish a "discussion platform" at European level for the exchange of information on education and training relating to radiation protection?

32. Would you be interested to participate in such a platform?

Country	Question 31	Question 32
Austria	No	Maybe someone else from Austria would be more appropriate
Belgium	Yes	Yes; somebody of the Federal Agency for Nuclear Control should participate
Denmark	In some cases	
Finland	Yes	Yes
France	Yes	Yes (We already work with European countries in the framework of ERPC: Spain, Italy, Belgium, Germany, UK)
Germany	Yes	Yes
Greece	Yes	Yes
Italy	Yes	Yes
Ireland	Yes	Yes
Luxembourg	Yes	In some cases
The Netherlands	Yes	Yes
Portugal	Yes	Yes
Spain	Yes	Yes
Sweden	Yes	Yes
United Kingdom	Yes	Yes

Question	Score (%)				
	Yes	In some cases	No	Other	No answer
Question 31	87	7	7	0	0
Question 32	80	7	0	7	7

## 11.2 Applicant Countries

The Applicant Countries answer uniformly positive to the questions concerning the discussion platform. All seven responders indicate that it is useful to establish a “discussion platform”. All responders want to participate in such a platform. The results can be found in Table 12.

Table 14 Discussion Platform (questions 31 - 32)

31. *Do you think it is useful to establish a “discussion platform” at European level for the exchange of information on education and training relating to radiation protection?*
32. *Would you be interested to participate in such a platform?*

Country	Question 31	Question 32
Czech Republic	Yes	Yes
Estonia	Yes	Yes
Hungary	Yes	Yes
Latvia	Yes	Yes
Malta	Yes	Yes
Poland	Yes	Yes
Romania	Yes	Yes

Question	Score (%)				
	Yes	In some cases	No	Other	No answer
Question 31	100	0	0	0	0
Question 32	100	0	0	0	0

## 11.3 Conclusions

- Except Austria and Denmark, all countries indicate that it is useful to establish a discussion platform at a European level for the exchange of information on education and training relating to radiation protection.
- The same countries want to participate in such a platform.

#### **11.4 Question 33**

The last question of the questionnaire, question 33, asked the responders if we could contact them again in the future for further clarifications and/or information on the topics addressed in the questionnaire. All 22 responders answered positively. The list of contacts can be found in Appendix B.



## 12 Conclusions

The study resulted in a fairly comprehensive overview of the present situation of the radiation protection expert in the EU Member States and the Applicant Countries. It showed the definitions and the legal status of the RPE in the regulations of the various countries and analysed the training and education systems in the field of radiation protection. Furthermore, it identified the requirements to move forward to mutual recognition of RPEs in the Member States and Applicant countries. Finally, the study revealed a wide interest in the establishment of and participation in a Discussion Platform, both as an instrument for the exchange of information and a vehicle to move forward to mutual recognition of the RPE. It is therefore concluded that the objectives of the study have been met.

It took, however, quite some effort to get the information from the various countries. Initially, the responses on the questionnaire were quite disappointing, but finally, after having sent reminders and with the help of members of the Art. 31 Expert Group, the response rate was 100 % (15 out of 15) for the EU Member States and 54 % (7 out of 13) for the Applicant Countries.

The reasons for the delayed response might have been threefold:

- the questionnaire was too long and too difficult;
- the contact points couldn't find the right persons to answer the questions;
- the delay was deliberate, since a number of countries were in a process of renewing their regulations.

For the EU Member States, the survey provides an overview of the status of the RPE at a moment when almost all Member States have incorporated the BSS in their national regulations, although some of them indicate that specific provisions related to the QE still have to be implemented. The definitions of the RPE in the national regulations are in general close to the definition of the QE. Therefore, in principle the definition and the status of the RPE in the regulations of the Member States are reasonably comparable.

The responding Applicant Countries claim to have implemented the provisions related to the QE in their regulations, or will do so in the near future, but only one country uses a definition of an RPE that is equal to the definition of the QE. In most countries, there is no clear definition of an RPE. One might assume (although we don't have any specific information on this!) that the number of responses from the Applicant Countries was biased to those countries that have indeed updated their regulations regarding radiation protection, as one of the steps to the membership of the European Union. Therefore, it is tempting to conclude that for the Applicant Countries as a whole, the definition and the status of the RPE need to be elaborated in their regulations, in order to make it comparable with the definition of the RPE in the EU Member States.

The responses indicate a broad variety of subdivisions of RPEs, both in Member States and in Applicant Countries. Some countries subdivide their RPEs either on the level of expertise or on the sector of work. Most of the countries use both possibilities to give the necessary distinction. When

subdivision is based on the level of expertise, it would seem sensible to define which level of expertise is compatible with the definition of the QE and which level should be considered as appropriate to a radiation protection officer. Though the responses indicated that the expertise of the QE is commonly restricted to the higher educated RPE, it is difficult to draw any common, unambiguous dividing line between an RPE and an RPO from the responses.

Most of the countries require an academic educational level of training for the RPE, specifically in the medical and nuclear sector. It is therefore obvious that many training courses are given at universities, though other training centres exist. Training courses generally address the topics mentioned in the basic Syllabus, but the information received so far is insufficient to compare the courses. When training course are given for a single sector of work, only part of the general topics may be addressed, together with specific topics relevant for the sector.

In many countries training centres have to be formally recognised, or certified, by the competent authorities. In some cases, formal recognition is only necessary in certain sectors, such as the medical sector.

Almost all EU Member States have their own national education systems for the training of RPEs. Luxembourg doesn't offer training courses, so their pool of RPEs is educated in other countries. In some countries, international bodies such as the EC, the IAEA and the European Association for Nuclear Medicine support some courses, depending on the sector of work.

About half of the EU Member States consider their own current education systems sufficient to train Qualified Experts, as defined in the BSS. A deeper study of the training material would be necessary to allow a comparison of national training courses with, for instance, the European Radiation Protection Course or the training courses of the IAEA.

In most of the responding Applicant Countries, the education and training programmes are supported by the IAEA. RPEs from those countries should therefore be comparable in quality. But only in some special cases do the responders consider the education system as sufficient to train people to the QE level.

Practical work is part of the training programme in most of the EU Member States and in about half of the Applicant Countries, although requirements are not always specified. Continuous training is incorporated in about half of the countries, both EU Members and Applicant Countries. In some cases this is restricted to certain sectors, such as the medical sector.

Professional experience is needed to become a recognised RPE in most of the countries, but not in all. The time period varies considerably, from zero up to several years, depending on the sector.

Feedback from users with regard to the needs and efficiency of the training programmes is given in many countries, although it is not always formalised.

In most of the EU Member States and all the responding Applicant Countries, the RPE (and also the QE) is formally recognised by the competent authorities. Certification is only operational in some countries, while some other countries are implementing a registration system. In the latter countries time limits are set, or will be set, for the validity of the registration. In most cases, this is five years, but other periods do occur. Only in a few cases is there feedback from the users.

Except for Luxembourg and Latvia, there is no automatic mutual recognition of RPEs from other Member States or Applicant Countries, although some countries indicate their intention to do so. Recognition is allowed in some countries on a case-by-case basis, though such countries normally require candidates to demonstrate an adequate knowledge of national regulations and language skills. This area should be further elaborated, in order to come to international agreement on the criteria for mutual recognition. The existing systems of registration and/or certification could form the basis for this. An inventory should be made of the requirements and procedures for registration and/or certification. Such information should come from the registration or certifying bodies.

Almost all countries welcomed the establishment of a Discussion Platform and expressed their interest in participating. Such a Platform is considered valuable as a means for exchanging information on education, training, recognition and registration of RPEs and may be a vehicle for moving forward to mutual recognition. The Platform could address many of the above-mentioned topics. Therefore it is necessary to find a structure that will guarantee continuity and the necessary finances to carry out the work of organising and administering the Platform.

### **Acknowledgement**

The authors express their gratitude to the contact points in the various countries for their support and specifically the respondents of the questionnaire. The discussions with the WPET during the project meeting have been very much appreciated, as well as the support and comments during the study of the scientific officer and the chairman of the WPET, Mrs Mercedes Sarro-Vaquero and Dr Sam Harbison, respectively.



### 13 Recommendations

- The results of the study show that in most of the EU Member States and in one of the Applicant Countries the definitions of the RPE in the regulations is close to the definition of the QE according to the BSS. Yet, the broad variety of training and education systems; of the subdivision of RPEs, either on the level of expertise or on the sector of work; and of the registration and recognition systems makes it difficult to compare the competences and responsibilities of an RPE in the various countries. In the context of the single market and the enlargement process, it is recommended to try to achieve harmonisation in the qualifications of the RPE, according to the definition of the QE. This would also help promote the achievement of the aims of the Directive on free movement of workers in the European Union and should take note of the Directive on safety at work.
- As a means of achieving this goal, it is recommended to establish a Discussion Platform that could serve as a means for exchange of information on education, training, recognition and registration of RPEs. This Platform may provide a vehicle for moving forward to mutual recognition. The topics mentioned in the recommendations hereunder could be addressed in such a Discussion Platform. This, however, requires a structure that guarantees continuity and the necessary finances to carry out the work. A possibility would be to establish the Platform as a Network under the 6<sup>th</sup> Framework Programme of the European Commission. The European ALARA Network could serve as a model for the structure of the Discussion Platform. A Steering Committee with a representative of each of the participating countries and the European Commission could set up a work plan.
- It is recommended to compare in more detail the definition, tasks and provisions for recognition of the RPE in the national regulations of EU Member States and Applicant Countries, in order to expose the obstacles preventing a harmonised implementation of the concept of the “Qualified Expert” throughout the European Union. This is specifically relevant for those countries that have not yet updated their regulations regarding to radiation protection, or have no or a divergent definition of the RPE.
- It is recommended to compare in more detail the subdivision of RPEs according to their expertise, in connection with their tasks and duties in radiation protection in the various countries. This is necessary to make a distinction between radiation protection experts and radiation protection officers. The definition of an RPE should be strictly interpretable as a QE on an international level. This is a prerequisite for mutual recognition.
- It is also recommended to compare in more detail the subdivision of RPEs according to the sector of work. The additional requirements for recognition of an RPE in the different sectors should be exposed and compared. Mutual recognition is likely to be more difficult if there are subdivisions of RPEs according to their field of work. (see also the previous recommendation).

- In many countries, training centres have to be formally recognised by the competent authorities. This recognition includes a demonstration of conformity with the requirements for the topics to be addressed in the courses. Nevertheless, a considerable number of the countries consider their own current education systems insufficient to train Qualified Experts, as defined in the BSS. It is recommended that the national training courses and materials, including practical work, should be evaluated and compared with the syllabus [2] and standardised training materials, such as those developed by the European Radiation Protection Course and the IAEA. When training courses are given for a single sector of work, the specific topics relevant for that sector should be taken into account.
- There is a trend to move to registration (or certification) of RPEs, as a means for assuring the quality of RPEs in the longer term. Continuous training is part of such a system, as well as professional experience. It is recommended that the requirements and procedures for registration of RPEs, including quality assurance procedures, should be studied in more detail. This can be considered as a follow-up of the work that was initiated by the working group of representatives of the EU Radiological Protection Societies, which produced a discussion paper on minimum requirements for mutual recognition of QEs [4]. This is also considered as a prerequisite for mutual recognition.
- It is recommended that the Discussion Platform should co-operate with other international bodies that are active in the field of training, education and recognition of RPEs.

## References

- [1] Council Directive 96/29/Euratom of 13 May 1996, laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation. Council of the European Union.
- [2] Communication 98/C 133/3 from the Commission concerning the implementation of Council Directive 96/29/Euratom laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation. Official Journal of the European Commission, 30 April 1998.
- [3] Council Directive 97/43/Euratom of 30 June 1997, on health protection of individuals against the dangers of ionizing radiation in relation to medical exposure, and repealing Directive 84/466/Euratom. Council of the European Union.
- [4] Minimum Requirements for Recognition of Qualified Experts. Discussion paper for the meeting of representatives of the European Radiological Protection Societies and the European Commission, Luxembourg, 3 March 2000.
- [5] Report of Co-Chairmen for Highlight Sessions: Associate Societies Forum. 10<sup>th</sup> International Radiological Protection Congress of the International Radiological Protection Association, 14-19 May 2000, Hiroshima, Japan.



## **Appendix A**

### **QUESTIONNAIRE**

To survey the present situation of “QUALIFIED EXPERTS” within the Member States and Applicant countries please mark your answer(s) in the open squares; sometimes more than one square can be marked if you need more space for explanation than provided in the boxes, please add additional sheets of paper, with reference to the question number

**Please return the questionnaire to:**

**NRG – Radiation & Environment  
Attn. F.S. Draaisma  
P.O. Box 25  
1755 ZG PETTEN  
The Netherlands**

**or return the electronic version to: *draaisma@nrg-nl.com***

In Title I of the Council Directive 96/29/Euratom of 13 May 1996 qualified experts are defined as

“Persons having the knowledge and training needed to carry out physical, technical or radiochemical tests enabling doses to be assessed, and to give advice in order to ensure effective protection of individuals and the correct operation of protective equipment, whose capacity to act as a qualified expert is recognized by the competent authorities. A qualified expert may be assigned the technical responsibility for the tasks of radiation protection of workers and members of the public.”

**Council Directive 96/29/Euratom**

<p>1. Are the provisions relating to qualified experts in the 1996 Basic Safety Standards 96/29/Euratom already implemented in your country's legal system?</p>	<p> <input type="checkbox"/> Yes  <input type="checkbox"/> No         </p>
<p>2. If yes, can you describe how these provisions are interpreted and implemented? (Please provide us with published documentation, if possible in English)</p>	
<p>3. If no, when is implementation scheduled?</p>	<p> <input type="checkbox"/> At ..... (date)  <input type="checkbox"/> Approximately ..... (time indication)  <input type="checkbox"/> Not officially announced  <input type="checkbox"/> I don't know         </p>

**Legal basis of the Radiation Protection Expert**

<p>4. Specify which piece(s) of legislation provide the current legal basis for the radiation protection expert. <i>Please provide a copy of the relevant text, preferably in English if available.</i></p>	
<p>5. If the provisions relating to qualified experts in the Council Directive 96/29/Euratom are not yet implemented, are the current definition(s) of a radiation protection expert in your country's law the same as or equal to that of the qualified expert in the Council Directive 96/29/Euratom?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No (Please describe the differences)</p>

**Different levels or classifications of Radiation Protection Experts**

<p>6. Are there different levels or classifications of radiation protection experts recognised in your country with regard to the complexity of the radiation applications, e.g. one simple X-ray machine or sealed source versus an institute with a number of different X-ray machines and/or open sources?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>7. If yes, please specify these different levels in terms of prior education, duration of the course, et cetera</p>	<p>Please use the form attached – ANNEX 1</p>
<p>8. Are there different types of radiation protection experts recognised in your country with regard to the field of work, e.g. nuclear power plants, fuel cycle, accelerators, medical applications, general industry, mobile sources, and research?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>9. If yes, please specify these different levels in terms of prior education, duration of the course, et cetera</p>	<p>Please use the form attached – ANNEX 2</p>

### Education and Training

<p>10. Please indicate which of the following bodies provide initial education and training for radiation protection experts. Specify whether these bodies are legally recognised with respect to their radiation protection training courses.</p>	<p><input type="checkbox"/> The government and/or local authorities</p> <p><input type="checkbox"/> Special training centres</p> <p><input type="checkbox"/> Universities</p> <p><input type="checkbox"/> In house education</p> <p><input type="checkbox"/> Others, i.e. ....</p>
<p>11. Is there an exam to pass in the education and training necessary to become a radiation protection expert? Specify for which levels of expertise, if there is a difference.</p>	<p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> In some cases</p> <p><input type="checkbox"/> No</p>
<p>12. Are there any provisions to ensure the continuing education and training, e.g. by refresher courses?</p>	<p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> In some cases</p> <p><input type="checkbox"/> No</p>
<p>13. In Annex 1 of Commission Communication C 133/12 (Official Journal of the European Communities of 30 April 1998), a basic syllabus for the qualified expert in radiation protection is published, together with recommended additional topics for five specific areas, i.e. nuclear installations, general industry, research and training, medical applications and accelerators. A copy of this Communication is added to this questionnaire. Are all topics addressed in your training program(s)? Indicate the number of hours dedicated to each topic for the different types of expert in your country. Please also specify if certain topics are only addressed in training courses for specific radiation protection experts.</p>	

<p>14. Is any practical work, or exercises, part of the training program?</p>	<p><input type="checkbox"/> Yes (specify on which topics and for how many hours)</p> <p><input type="checkbox"/> No</p>
<p>15. Is professional experience necessary to become a radiation protection expert in your country?</p>	<p><input type="checkbox"/> Yes (specify the number of years of practical experience for each type of expert)</p> <p><input type="checkbox"/> No</p>
<p>16. Is your education system sufficient to become a qualified expert as defined in the Council Directive 96/29/Euratom? Please specify your answer.</p>	<p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> In some cases</p> <p><input type="checkbox"/> No</p>

<p>17. If no, what are the conditions to become a qualified expert as defined in the Council Directive 96/29/Euratom?</p>	
<p>18. Is your country's education and training programme part of a common education and training programme for some countries in a certain region of Europe?</p>	<p><input type="checkbox"/> Yes (specify the region)</p> <p><input type="checkbox"/> No</p>
<p>19. Is your country's education and training programme supported by another country or an international organisation, such as IAEA?</p>	<p><input type="checkbox"/> Yes (specify the type of support)</p> <p><input type="checkbox"/> No</p>
<p>20. Please list the major institutes in your country for education and training of radiation protection experts.</p>	

<p>21. Is there any input, or feedback, from the users of ionising radiation (such as employers, unions, professional bodies) with regard to the needs and efficiency of the education and training program in your country?</p>	<p><input type="checkbox"/> Yes (please specify)</p> <p><input type="checkbox"/> No</p>
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**Recognition, registration and certification**

<p>22. Are radiation protection experts in your country formally recognised by the relevant competent authorities?</p>	<p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> In some cases</p> <p><input type="checkbox"/> No</p>
<p>23. Are qualified experts (in the same sense as in the definition of the Council Directive 96/29/Euratom) recognised in your country?</p>	<p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> In some cases</p> <p><input type="checkbox"/> No</p>
<p>24. Are qualified (or radiation protection) experts registered or certified in your country?</p>	<p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> In some cases</p> <p><input type="checkbox"/> No</p>



**Mutual recognition**

<p>28. Are radiation protection experts from other EU countries currently recognised as qualified experts in your country from a legal point of view?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>29. If yes, please specify the provisions for mutual recognition.</p>	
<p>30. If no, are there informal arrangements or the intention to move towards a legal system?</p>	

**Discussion platform**

31. Do you think it is useful to establish a “discussion platform” at European level for the exchange of information on education and training relating to radiation protection?	<input type="checkbox"/> Yes <input type="checkbox"/> In some cases <input type="checkbox"/> No
32. Would you be interested to participate in such a platform?	<input type="checkbox"/> Yes <input type="checkbox"/> In some cases <input type="checkbox"/> No

**Finally**

33. If necessary, may we [or who else?] ask you for further information on this topic in the future?	<input type="checkbox"/> Yes <input type="checkbox"/> No
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*-- We sincerely thank you for all your interest and time to answer this questionnaire! --*

### ANNEX 1 – Form for answering question 7

Specify the different levels or classifications of qualified experts recognised regarding the complexity of the radiation applications, e.g. one simple X-ray machine versus a research institute with a research reactor. (Example from the Netherlands)

Country	Level of Expertise	Type of Practice	Duration of the Radiation Protection Course	Prior Education	Professional Experience	Comments
Netherlands	Level 1	Not specified	No course available (see comments)	Not specified (see comments)	Yes	Internationally recognised qualified expert; no specific criteria
	Level 2	Complex and multiple practices with sealed and open sources, X-ray generators and accelerators; high risk level; all sectors	2 Months	Academic or equivalent	Experience as a Level 3 expert	Course is given every 4 to 5 years by a recognised training centre. Divided in 5 weeks of theory, 1 week practical work, 1 week trainee and excursions. Followed by examination
	Level 3	Practices with sealed and/or open sources or X-ray generators; intermediate risk level; all sectors	4 Weeks	Secondary education	Not necessary	Course is given 1 to 2 times a year by recognised training centres (6). 3 Weeks theory and 1 week practical work. Followed by examination
	Level 4a/b	Single practices with sealed sources and X-ray generators (4a), or with open sources (4b); moderate risk level; all sectors	1 Week	Secondary education	Not necessary	Course is given several times a year by recognised training centres (7). Followed by examination
	Level 5a/b	Single practices with sealed sources and X-ray generators (5a), or with open sources (5b); low risk level; all sectors	3 Days	Not specified	Not necessary	Course is given several times a year by recognised training centres (11). Followed by examination

**ANNEX 1 – Form for answering question 7**

Specify the different levels or classifications of qualified experts recognised regarding the complexity of the radiation applications, e.g. one simple X-ray machine versus a research institute with a research reactor. Use the format as in the example from the Netherlands

Country	Level of Expertise	Type of Practice	Duration of the Radiation Protection Course	Prior Education	Professional Experience	Comments

**ANNEX 2 – Form for answering question 9**

Specify the different types of qualified experts recognised regarding the type of field they work in, e.g. nuclear power plants, fuel cycle, accelerators, medical applications, general industry, mobile sources, and research (Example from the Netherlands)

Country	Type of Expert	Work Field	Prior Education	Additional Protection Training	Radiation	Duration of the Additional Course	Comments
Netherlands	Level 2	Can work in every sector	See Annex 1	Not necessary			Expert is obligatory in the nuclear sector, big research centres, universities, big hospitals and big industries. Specific additional training may be required by employer, depending on the job
	Level 3	Can work in every sector Medical sector	See Annex 1 Medical doctor	Not necessary Not necessary			For medical officers working for an employer using ionising radiation, the level 3 course is an obligatory part of their education.
	Level 4	Can work in every sector	See Annex 1	Not necessary			
	Level 5	Can work in every sector	See Annex 1	Not necessary			

**ANNEX 2 – Form for answering question 9**

Specify the different types of qualified experts recognised regarding the type of field they work in, e.g. nuclear power plants, fuel cycle, accelerators, medical applications, general industry, mobile sources, and research. Use the format as in the example from the Netherlands

Country	Type of Expert	Work Field	Prior Education	Additional Protection Training	Radiation	Duration of the Additional Course	Comments



## Appendix B

### List of contact points

EU Countries	Name	Address	Tel/Fax/E-mail
Austria	Dr. Josef ZECHNER	Federal Chancellery Radetzkystr. 2 A-1030 VIENNA	Tel: 00431711724134 Fax: 004317122331 E-mail: josef.zechner@bmgk.gv. at
Belgium	Dr. Patrick SMEESTERS	Ministère de la Santé Publique et de l'Environnement Service de Protection contre les Radiations Ionisantes Rue Ravenstein 36 B-1000 BRUXELLES	Tel: 0032 2 289 21 39 Fax: 0032 2 289 21 12 E-mail: Patrick.Smeesters@FAN C.FGOV.BE
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<b>Applicant Countries</b>			
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