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Comparing radiation protection courses in Germany and The Netherlands – A bilateral pilot

Workshop version

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Abstract
In 2010 a pilot started with representatives from Germany and The Netherlands focusing on comparison of RP courses in these countries. This pilot is of particular importance for both countries as there are many RWs, especially in the medical field, crossing the common border. Both the design of the project and the first results of the pilot will be discussed.

Introduction

Within Europe there are many differences in criteria for radiation workers (RWs), radiation protection officers (RPOs) and experts (RPEs). These differences, which are reflected in the various systems of radiation protection courses and legal recognition of RPOs and RPEs hampers the free traveling of RWs, RPOs and RPEs within Europe. It is one of the goals of the European Foundation on Training and Education in Radiation Protection (EUTERP) to remove these obstacles within the Member States of the EU. From the workshops held by this platform in the period 2007-2009 it has been concluded that an essential element in achieving this goal is the availability of a good comparison of the content of the RP courses in the Member States.

The Netherlands has in the past EUTERP workshops pointed out that, without denying the importance of mutual recognition of RPEs and eventually RPOs, the vast majority of relevant employees crossing EU borders are Radiation Workers (RWs). In 2008, at the 2nd EUTERP workshop, The Netherlands therefore suggested to start a (bi- or multilateral) pilot project to make a start with the aforementioned comparison, paying special attention to RP training of RWs[5]. EUTERP-members from Germany and The Netherlands agreed to participate in this pilot. The importance of the project is reflected by the fact that there are many RWs, especially in the medical field, crossing the common border between the countries.

Objectives

The pilot aims to reach the following objectives

1. An inventory of the system of RP courses in both countries
2. A comparison concerning the content of various courses with the 'standard' IAEA Syllabus[6] or its European equivalent
3. Conclude about equivalence and/or gaps between the various courses offered in both countries

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[5] H.F. Boersma and A.M.T.I. Vermeulen, 2nd EUTERP Workshop, Vilnius, 2008 – published on http://www.euterp.eu/uploads/media/Paper_Oral_Netherlands_1_.doc
[6] Postgraduate Educational Course in Radiation Protection and the Safety of Radiation Sources – Standard Syllabus, IAEA, Vienna, 2002 – http://www-pub.iaea.org/MTCD/publications/PDF/TCS-18_web.pdf.

4. If applicable: give advice to the competent authorities about mutual recognition of these courses
5. Report on these results via the EUTERP website in order to make the results available to the whole EUTERP-community.

Participants

This pilot is a common project of several institutions dealing with Radiation Protection Courses in the Netherlands and Germany. Participating institutes and their representatives are:

- Leibniz University Hannover (dr. J.-W. Vahlbruch)
- University of Groningen (dr. H.F. Boersma)
- Technical University Delft – NCSV (M. Schouwenburg, BSc)
- Leiden University Medical Center (ing. A.J.M. Gerritsen), only for the first stage (see below)

Work programme

The project will be divided into two stages.

1. Inventory of courses in Germany and the Netherlands; comparison of one or a few courses with the Standard IAEA Syllabus.
2. Realization of a complete comparison of the available courses and formulation of the subsequent conclusions for mutual recognition of the courses.

Stage 1 is carried out by students participating in the Dutch Radiation Protection Course Level 2 which is currently given. This course, intended for RPEs responsible for high risk and/or complex licences in the Netherlands, is organized in a collaboration between the Technical University in Delft and Leiden University Medical Center.

After completion of stage 1 there will be the possibility to stop or continue the project depending on the available funding and the results from stage 1. A proposal for this stage will be made presumably in the course of 2011. In preparing this proposal we will consider

1. joining in work packages of ENETRAP 2 or
2. continuing the project within EUTERP and/or
3. extending the (objectives and participants of the) project to include e.g. Belgian RP courses.

Assignment of stage 1

The first stage of the project was prepared at a meeting on Borkum, Germany, during the annual meeting of the Fachverband für Strahlenschutz in September 2010.

We reconfirmed the intention to focus on the 'lowest level' RP-courses in both countries. Due to the relative complexity of the German RP education system we also decided to restrict the assignment to courses in the medical and technical/research field. The nuclear sector was left out for the moment due to its limited importance, especially in the Netherlands. Additionally we decided to restrict the general description of the German and Dutch RP E&T program to a global outline, mainly to leave enough time for the rest of the assignment.

The students had to visit during their apprenticeship the Leibniz University in Hannover and the Landesanstalt für Personendosimetrie und Strahlenschutzausbildung (LPS) in Berlin to get inside information about the German RP E&T system in the technical and medical fields respectively.

The final report will contain:

1. A overview of the RP course system in both Germany and The Netherlands;

2. A clear indication which German courses cover (except for legislative aspects) the content of the Dutch level 5A and/or 5B Courses

The report will be available in English at the EUTERP website.

E&T System in Germany and the Netherlands

In this chapter we restrict ourselves to the RP Course system in both countries refraining from most of the legal framework of these systems.

Roughly speaking the German system is divided into three branches: technical (including research), medical and nuclear. Each branch has a modular structure. In practice there are many different kinds of "Strahlenschutzbeauftragter (SSBs)" – in most cases comparable to RPOs – depending on the kind of source of radiation (radioactive source, an accelerator-system or a X-ray facility) and on the potential risk of the respective application. Therefore, different practical experience (depending on the professional education) and different radiation protection courses are required for different applications. That leads altogether to 37 different kinds of Expert Knowledge Groups for technical applications – resulting in 37 different kinds of SSBs for the technical branch only. In Figure 1 we give the modular system according to the German Technical Expert Knowledge Directive, finally leading to the 37 different knowledge groups for the technical/research branch[7].

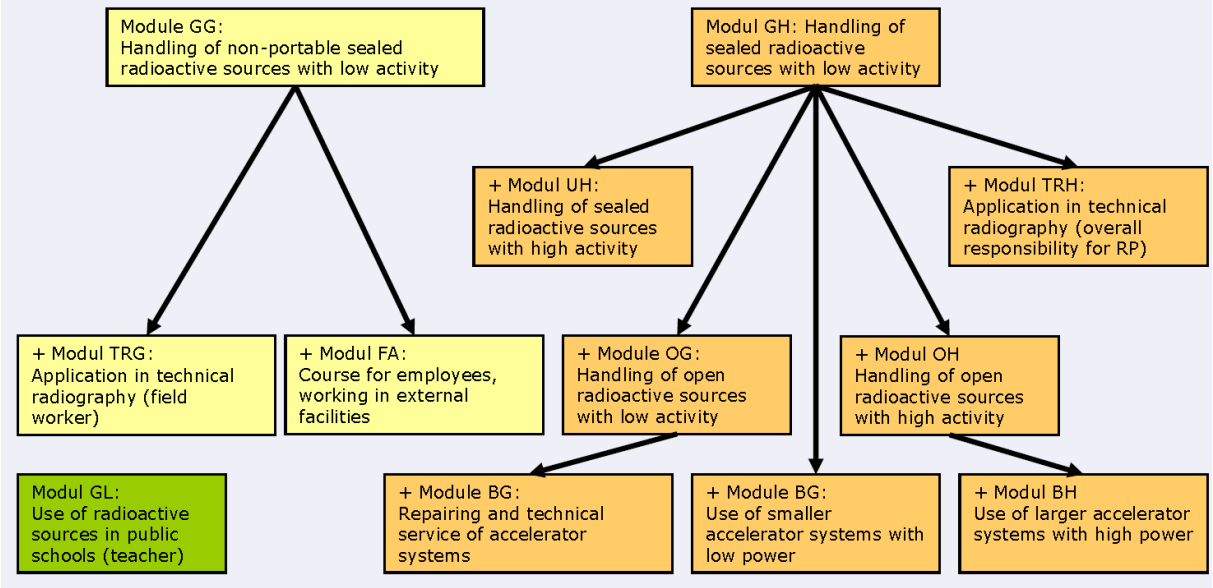

Figure 1. Modular structure of the German system of RP E&T (technical branch, concerning the handling of sealed and open radioactive sources and accelerator systems)

In the Netherlands only the lower level RP courses are divided into X-ray applications (A-variant) and the use of open sources (B-variant). Sealed sources are covered similarly by all RP Courses. The Dutch system has been discussed in some more detail during the 2nd EUTERP workshop and is summarized in Table 1.

[7] Radiation Protection Courses for Technical Applications in Germany – An overview – J.-W. Vahlbruch (ETRAP 2009, 4th International Conference on Education and Training in Radiological Protection, 8 - 12 November 2009, Lisbon, Portugal)

Level of Expertise	Characteristics	Supervision for
5 (A or B)	Low risk and few sources	X-ray (A) or sealed sources (A&B)
4 (A or B)	Moderate risk or low risk and more than ten sources	X-ray (A) or sealed sources (A&B)
3	Significant risk	small accelerators, X-ray, sealed and open sources
2	High risk / complex licenses	All licenses

Table 1. Summary of the Dutch system of RP E&T.

Comparison of Dutch Level 5 courses with German equivalents

In Germany Radiation Workers have to be instructed by the SSBs. In Dutch legislation this situation is basically the same. However, many Dutch employers implement this requirement by obliging Radiation Workers to take as a start the level 5 Course. It is for this reason that in the comparison we restrict ourselves to the Dutch level 5 courses and its German equivalents. The preliminary results are written down in an intermediate report[8]. A remarkable fact is that in the German system for each module the amount of time spent to various topics is determined in detail. In contrast the Dutch system only specifies the level of knowledge of these topics. Nevertheless there is remarkable agreement in the duration of 'regular' Dutch Level 5 courses (31-38 hours) For comparison: the basic RP courses in the technical branch in Germany, modules GG and GH from Figure 1, take 14 and 26 hours respectively.

The first results from the comparison of the basic RP course in the medical field with the Dutch level 5 courses yield a few differences. The German 'Grundkurs im Strahlenschutz für Ärtzte und Medizinphysiker' pays special attention to radiation accidents in the medical field and (presumably patient) dosimetry. The Dutch level 5B course pays special attention to radiation safety of open sources as well as radioactive waste. It has to be noted that in this study the coursebook by Brouwer and van den Eijnde[9] was used as a starting point for the content of the level 5 courses – the book is generally assumed to reflect the up-to-date knowledge for level 5 in the Netherlands. Apart from the RP content, this book contains a short introduction in both mathematics and statistics (measurements and measurement errors).

The detailed differences between the content of various courses will be presented in matrix form. As an example, Figure 2 contains the summary of the German medical basic course and the level 5 courses in the Netherlands. It is our intention to have an English version available in the final report. A comparison between the relevant courses and the IAEA Standard Syllabus yet has to be made.

[8] M.J.W. Greuter, O. A.D.M. van Dongen, J.H.P. Haagen, Comparison of the lowest level radiation protection courses in Germany and The Netherlands – a bilateral pilot, February 2011

[9] G. Brouwer & J. van den Eijnde, Practical Radiation Protection, Syntax Media, 2008, ISBN 978 90 77423 63 9

Practical Radiation Protection - Brouwer & Van den Eijnde		Grundkurs im Strahlenschutz fur Arzte und Medizinphysiker													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Physikalische Grundlagen des Strahlenschutzes	Dosisgrosen und -einheiten, Messtechniek	Bestimmungen der Rontgenverordnung	Strahlenbiologische Grundlagen und Strahlenrisiko	Naturliche und zivilisatorische Strahlenexposition	Arbeitsmedizinische Vorsorge, Unfalle, Storfalle	Nuklearmedizin	Gezetzliche Grundlagen der Strahlenschutzverordnung	Berechnungsgrundlagen und Dosismessungen	Dosismessungen II	Messung von Kernstrahlung	Grundlagen des baulichen und apparativen Strahlenschutzes	Strahlenunfalle in der Medizin	Einfuhrung in die Strahlentherapie
1	Structure of the atom and decay	1				1									
2	Sources, X-ray equipment and neutron radiation	1						1							1
3	Interaction of radiation with matter and shielding of radiation	1								1		1			
4	Radiation detection		1												
5	Quantities and units in radiation protection		1												
6	Biological effects of radiation				1										
7	The system of dose limitation and the international guidelines			1			1		1						
8	Safety precautions for sealed sources and X-ray machines								1				1		
9	Dosimetry in practice									1					
10	Safety precautions for open sources														
11	Radioactive waste														
A	Mathematics														
B	Measurements and measurement errors														

Figure 2. Comparison of topics covered in German medical basic RP Course and Dutch level 5 courses

Conclusion

The final report of stage 1 of this project is expected to be published in July, 2011. We hope that this report will be a starting point for future extension in order to facilitate the judgment of equivalence of various RP E&T programs in the European Member States.

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