Legal requirements for radiation protection training in Germany

A. Schmitt-Hannig[(1)] and R. Sefzig[(2)]

[(1)]Bundesamt für Strahlenschutz,Germany
[(2)]Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, Germany

Abstract
Proper education and initial training together with constant professional training in conceptual, administrative and operational radiation protection is essential for ensuring that workers in the field of radiation are qualified to be in positions of responsibility. Each licensee in Germany requires that there be at least one person be in charge of radiation protection matters for the type of work being performed.
This person (e.g. a technician, physicist, medical doctor, etc.) needs

- Adequate education and training in radiation protection depending on the type of practice, his/her qualification and radiation protection tasks.
- Practical experience in a typical relevant practice for, in general, some months (i.e. small sources) up to 2 years (i.e. medical physicist) or 3 years (i.e. in medical therapy. This time may be included in the physician's professional training as a specialist in a specific therapeutic field)
- Task specific training courses in radiation protection lasting from some days up to several weeks and ending with an examination. The training facilities providing the courses should be accredited by the competent authority.

All these requirements are regulated in a number of guidelines related to different types of practices and professional groups.

1. Introduction

In order to take responsibility in working in the field of radiation protection, a proper education and initial training as well as continuous professional training in conceptual, administrative and operational radiation protection is essential. The obligation for appropriate training and information of personnel occupationally exposed to ionizing radiation or personnel with a potential contact to radiation is therefore laid down in the relevant European safety directives.

2. Radiation protection training situation in Germany

On the national level, the legal requirements for radiation protection training differ widely in Europe. In Germany, each licensee needs at least one person who is in charge of radiation protection matters in relation to the licensee's type of 'practice'. This person, who could be for example a technician, an engineer, a physicist, a medical doctor etc., needs an

- adequate education and training in radiation protection depending on the type of practice and on his/her qualification and radiation protection tasks;
- practical experience in a typical relevant practice, in general some months (i.e. for small sources) up to 2 years (i.e. medical physicists or radiation protection personnel in nuclear power plants) or 3 years (i.e. for medical therapy - this time may be included in the physician's professional training as a specialist in a specific therapeutic field);
- task specific training courses in radiation protection (mainly legal requirements, guidelines, practical issues) lasting from some days up to several weeks, ending with an examination; the training centres providing the courses need accreditation by the competent authority.

All requirements are regulated, in general, in the Radiation Protection Ordinance and, in detail, in a number of guidelines [1-10] related to different types of practices and professional groups. These guidelines include the content of training courses and periods of practical experience.

Legal requirements: guidelines (GL) concerning the qualified competence in radiation protection

MEDICAL AREA
• GL „Radiation Protection in Medicine“ • GL on the „Qualified Competence according to the X-Ray Ordinance“ • GL on “Medical Surveillance of Occupationally Exposed Persons” • GL on “Radiation Protection in Veterinary Medicine”
INDUSTRY and RESEARCH
• GL on the „Qualified Competence in Radiation Protection“ • GL on the „Qualified Competence for the Operation of Non-Medical X-Ray Units“
NUCLEAR AREA
• GL on the „Qualified Competence of Personnel in Charge of Radiation Protection in NNP and other Nuclear Installations” • GL on the “Demonstration of Qualified Competence of NNP Personnel” • GL on the “Demonstration of Qualified Competence of Research Reactor Personnel”

3. Examples

In the following, examples are given of expert knowledge required according to the GL on the „Qualified Competence in Radiation Protection“ for the application of sealed radioactive sources, non-destructive testing with sealed radioactive sources and for the application of unsealed radioactive sources.

Expert knowledge – Application of sealed radioactive sources

Expert knowledge CL : clearance level		**Minimum period of vocational experience dependent on the vocational education in months**				**Radiation protection course**
Vocational education		no	sw	e, m	gu, gc	Duration
2	**Application of sealed radioactive sources**					
2.1	Use and storage of devices with r. s. ($A \leq 10^5$-times the CL)	3	0	0	0	14 h
2.2	Handling of r. s. ($A \leq 10^5$-times the CL)	12	3	3	0	26 h
2.3	Handling of r. s. (if not covered by 2.1 or 2.2)	-	12	6	3	39 h

sw: skilled worker; e,m: engineer, master; 0: no vocational experience necessary
gu, gc: graduate from university, technical college; no: no technical degree
- not provided by the corresponding vocational education;

Expert knowledge – Non-Destructive testing with sealed radioactive sources

Expert knowledge		**Minimum period of vocational experience dependent on the vocational education in months**				**Radiation protection course**
Vocational education		No	sw	e, m	gu, gc	duration
3	**Non-destructive testing (with sealed radioactive sources)**					
3.1	Radiation protection supervisor with restricted competence (at changing places of work) (RPA)	12	6	3	3	32 h
3.2	Radiation protection supervisor with overall responsibility	-	12	6	3	38 h
sw: skilled worker; e,m: engineer, master; 0: no vocational experience necessary gu, gc: graduate from university, technical college; no: no technical degree - not provided by the corresponding vocational education;						

Expert knowledge – Application of unsealed radioactive sources

Expert knowledge CL : clearance level		**Minimum period of vocational experience dependent on the vocational education in months**				**Radiation protection course**
Vocational education		no	sw	e, m	gu, gc	duration
4	**Application of unsealed radioactive sources**					
4.1	Handling of r. s. ($A \leq 10^5$-times the CL)	24	9	6	3	39 h
4.2	Handling of r. s. ($A > 10^5$-times the CL)	-	24	9	6	54 h
4.3	Handling of nuclear materials	-	-	9	6	60 h
sw: skilled worker; e,m: engineer, master; 0: no vocational experience necessary gu, gc: graduate from university, technical college; no: no technical degree - not provided by the corresponding vocational education;						

4. Recognition

If the prerequisites are fulfilled (appropriate verification and certificates are required) the person is recognised (assessment of proofs and certificates) by the competent authority (or an appropriate institution when the competent authority has delegated the recognition) either

- in an individual accreditation document (physicians or medical physicists); or
- within the scope of licensing procedures, for all other persons trained - or later on, when persons change,
- via reporting to the competent authorities.

Accreditation for all persons trained as well as subsequent regular 'refreshment' of training every 5 years is required in the Radiation Protection Ordinance and in the X-Ray Ordinance.

5. Conclusion

In order to achieve an equivalent level of qualified competence in radiation protection in Europe, action has to be taken, beyond national systems and different approaches, to harmonize curricula, duration and recognition of the qualification and experience acquired in courses and during practical training within Europe. The formulation of European guidelines for minimum requirements of content, duration and recognition of training incorporated in the regulatory framework could be a first step to a more uniform approach.

References

[1] Strahlenschutzverordnung vom 20.07.2001, BGBl. I S.1714
[2] Röntgenverordnung vom 30. April 2003, BGBl.I 2003, Nr. 17
[3] Richtlinie Strahlenschutz in der Medizin vom 24. Juni 2002, Bundesanzeiger Nummer 207a vom 7. November 2002
[4] Richtlinie Arbeitsmedizinische Vorsorge beruflich strahlenexponierter Personen durch ermächtigte Ärzte vom 18.12.2003 (GMBl. Nr. 19 2004, S. 350)
[5] Richtlinie Strahlenschutz in der Tierheilkunde vom 02.02.2005 (GMBl. Nr. 32 2005, S. 666)
[6] Fachkunderichtlinie Technik nach Strahlenschutzverordnung vom 18.06.2004 (GMBl. Nr. 40/41 2004, S. 799)
[7] Fachkunderichtlinie Technik nach Röntgenverordnung vom 5. Mai 2003 (GMBl. vom 29.08.2003, S. 638)
[8] Richtlinie für den Fachkundenachweis von Kernkraftwerkspersonal vom 14.4.1993 (GMBl. 1993, S. 358)
[9] Richtlinie für den Fachkundenachweis von Forschungsreaktorpersonal vom 16.02.1994 (GMBl. 1994, S. 366)
[10] Richtlinie für die Fachkunde von Strahlenschutzbeauftragten in Kernkraftwerken und sonstigen Anlagen zur Spaltung von Kernbrennstoffen vom 10.12.1990 (GMBl. 1991, S. 56)

Corresponding Author:
Annemarie Schmitt-Hannig
Bundesamt für Strahlenschutz
Ingolstaedter Landstr. 1
D-85764 Oberschleissheim
Germany
T: + 49 89 31603 2110
F: + 49 89 31603 2115
e-mail: schmitt@bfs.de