

Ongoing efforts of HERCA on the Harmonisation of the Radiological Monitoring Systems for Outside Workers

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Abstract

HERCA[1] is an association which brings together the Heads of 47 European Radiological protection Competent Authorities from 29 countries, in order to build and maintain a network of chief radiation safety regulators in Europe. A working group was created in 2007 to investigate on the practical implementation of the Directive 90/641/Euratom[2] and on how a better harmonisation of the radioprotection systems for outside workers could be achieved. In 2008, a survey was lead about the practical transposition of the Directive within the Member Countries. It allowed to derive the commonalities and variations of the radiological monitoring systems for outside workers and to compare the content registered in the radiation passbooks to the required information in the Directive. A model of radiological passbook was proposed by this working group, including the harmonisation of terminology and of the requirements on data content, with a distinction between mandatory fields and optional fields. The Radiation Passbook can be a paper based system but countries could also opt to use an electronic (possibly web-based) system instead of the paper based system (or parts of it). The radiation passbook is one of the first major achievements of HERCA, in its aim of harmonisation at the European level. The proposal was sent to the European Commission for its inclusion in the Basic Safety Standards (BSS) recast. Additionally, HERCA invited all European national competent authorities and stakeholders to express their comments. Furthermore, a guidance document on how to implement and use the passbook is being developed. In 2010, the working group has been given the new mandate to carry out a feasibility study for the transition to an electronic information exchange between countries for the radiological protection of workers.

Key words : HERCA, outside worker, radiation passbook, radiological monitoring system, BSS

1. Introduction

In the beginning of the 1980ies, the problem of outside workers' radiation protection within the nuclear facilities was raised. Those workers received 80% (and even more) of the collective dose from most nuclear facilities and most of the time higher individual doses than the workers of the nuclear undertakings. Outside workers' radiation protection was not explicitly taken into account into the 1980 Basic Safety Standards[3]. In 1990, the European Commission issued the Directive 90/641/Euratom in order to ensure that outside workers would benefit from the same level of protection as permanently

employed workers. Nevertheless, the practical implementation of these requirements varies considerably among the different European countries.

2. HERCA

HERCA is an association which brings together the Heads of European Radiological protection Competent Authorities. It was created in 2007 at the initiative of the French Nuclear Safety Authority (ASN). It currently brings together 47 Radiation Protection Authorities (RPA) from 29 European countries. HERCA consists of a Board of Heads and topical working groups. The highest decision-making body of HERCA, the Board of Heads, is composed of national representatives at managerial level appointed by the corresponding radiation protection authority. The topical working groups are composed of senior experts from the different national RPAs. Currently, there are working groups in the following domains : Outside workers & Radiation Passbook, Non-medical sources and practices, Medical Applications, Emergencies and Surveillance of collective doses from medical exposures.

The objectives of HERCA are to build and maintain a network of chief radiation safety regulators in Europe; to promote exchange of experience and learning from each other's best practices; to discuss and where appropriate, express its consensus opinion on significant regulatory issues; to develop, by consensus whenever possible, a common approach to radiological protection issues and to have an impact on the practice of radiological protection, within the Countries of HERCA members.

The association involves, as appropriate, the European Commission and other relevant stakeholders in its activities. At the occasion of the first meeting of the Heads of European Radiological protection Competent Authorities (HERCA), which took place in Paris on 29 May 2007, it was decided to create a working group to investigate on the practical implementation of the Directive 90/641/Euratom within the Member Countries and on how a better harmonisation of the radioprotection systems for outside workers amongst the Member Countries could be achieved.

3. Methodology

The working group Outside Workers and Radiation Passbook met for the first time in January 2008. Its basic objective was to ensure in an efficient way the radiological protection of both permanently employed and outside workers. For a given level of risk, radiological protection of outside workers should not be less than that of permanently employed workers.

The working group decided, as a first step, to lead a survey for the transposition of the 90/641 Euratom Directive within the Member Countries covering a series of aspects : local terminology, rights, responsibilities and obligations of the various parties, radiological monitoring system for outside workers, contents of dose register and radiation passbook, approval of dosimetry services. 23 countries participated in the survey.

In this way the commonalities and variations of the radiation monitoring systems for outside workers within the countries could be derived and compared to the required information in the Council Directive 90/641/Euratom. In addition, the national legislative difficulties in providing the information required from the directive could be identified. The results of the survey were presented in a report[2].

Based on the answers to the survey, further steps towards harmonization of the systems amongst the different countries were proposed : a common terminology, a set of good practices, the data contents of a Radiation passbook and a model of Radiation passbook.

4. Good practices used in developing a national radiation passbook and in its practical use

Good practices were identified for creating a radiation passbook and its subsequent practical use by the employer and the undertaking. These "good practices" were derived from the answers to the questionnaire, the examples of existing radiation passbooks, single use documents and experience from countries using an electronic system.

4.1 Application of the 90/641 Euratom Directive

The Directive stipulates that Member states shall establish a centralized national network or the issuing of an individual radiological monitoring document for all outside workers of category A (category B is optional), including employees, self-employed workers, students, apprentices and trainees.

On a transitional basis to a uniform system on Community level for the radiological protection of outside workers, the issuing of individual radiological monitoring documents or radiation passbooks must in any case be established by the Member States for cross-frontier outside workers of category A.

4.2 Selected definitions

The definitions should be taken from or in accordance with the definitions in the Directive, in particular for Outside worker, which should include mention of self-employed workers, students, apprentices and trainees, Employer and Undertaking.

4.3 Rights and responsibilities

The radiation passbook (or single issue document) or electronic system must enable the undertaking to

- check the dosimetric data (in order to verify the respect of the dose limits and to apply the ALARA principle), the medical fitness, and whether the outside worker needs a training specific to the activities to be carried out in the controlled areas, prior to allowing the outside worker to enter the undertaking's controlled areas.
- enter in the passbook an estimate of the radiation dose received by the outside worker in the undertaking's controlled area

The employer should have made arrangements for

- official dosimetry (the dosimeters may be actually provided by the undertaking by arrangement)
- medical surveillance (possibly using the medical surveillance system of the undertaking by arrangement)
- basic training (the basic training may actually be provided by the undertaking by arrangement)
- any specific training needed by his employees for the work activities to be carried out in the undertaking's controlled areas. This training would normally be provided by the undertaking.
- keeping the **radiological data** of the individual exposure monitoring and the data of medical surveillance (medical fitness, date of next medical examination) of each of their workers **up to date** in the radiation passbook;
- authorization/notification of their activities as required by national regulations.

4.4 Practical use of the passbook

- The content and the issuing procedure should follow the requirements of the regulator/issuing authority.
- The owner of the data should be the home country (of the employer). The decision of who keeps the data is up to the Member Country: (authority, employer or approved dosimetry)
- It is up to the Member States to decide who can issue the passbook;
 - The passbook can be composed of different parts issued by different bodies (e.g. in some countries, parts about dosimetric and medical surveillance are issued by 2 different entities);
 - It could either be **official bodies or approved dosimetry services**.
- The employer is responsible for obtaining a radiation passbook for each of his/her outside workers.
- Non-transferability between Outside Workers should be ensured by unique identification of the worker in the passbook.
- Non-plurality can be checked by use of a register of the issued radiation passbooks (with unique serial number) coupled to a unique number identifying the worker. If each issued

document has a unique number and if it can be linked to its holder in the database, it is easy to see how much documents correspond to an individual worker. If the expiration date as well as the status (in circulation/returned) of the issued documents are also recorded in the database, one can check that a worker is not in possession of several documents. An Outside worker should only have one radiation passbook even if he has more than one employer. Consequently the passbook should allow to enter more than one employer.

- Language : either national language(s) + English or national language(s) with code
- The media used for the radiation passbook is up to the Member States. It can either be **electronic or paper-based**
- The passbook can be composed of **one document of several documents**. If it is composed of several documents, each document should not necessarily be issued by the same issuing body.
- Validity period : the document must mention its validity period if it is reusable.
- Reusability : the document should mention whether it is single use or multi-use
- The employer keeps a register of who has been authorised, on behalf of the employer, to write information into specified parts of the radiation passbook e.g. details of the current employer, date of medical review, details of official dosimetry for the current year.
- The undertaking keeps a register of who has been authorised, on behalf of the undertaking, to write information into specified parts of the radiation passbook e.g. estimated doses for activities in the undertaking's controlled areas

5. Data to include in the radiation passbook and passbook model

The content of the document (passbook or single use document) should provide all the information required by the Directive.

In order to fulfil these requirements, a list of mandatory and optional data fields were proposed by the working group. A model of radiological passbook (figure 1) has been elaborated as a tool in order to better visualize these mandatory (in black) and optional (in grey) fields. It is not obliged to use the model exactly as it is. Countries can use their own model as far as it meets the good practices given in and it contains the minimal data content (black fields).

FRONT COVER (Identification of Radiation Worker)

 
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <i>Window to allow to see picture on next page</i> </div>
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="margin: 0;">Radiation worker</p> <p style="margin: 0;">[SURNAME] [2nd SURNAME]</p> <p style="margin: 0;">[First name] [Middle names]</p> <p style="margin: 0;">[Unique identification number of the worker]</p> </div>
<i>Ref. of domestic Legislation under which Radiation Passbook is issued</i>
<p style="margin: 0;">RADIATION PASSBOOK</p> <p style="margin: 0;">BELGIUM</p> <p style="margin: 0;">[Country code (ISO3166) - Passbook number - Passbook sequence number]</p> <p style="margin: 0;">[bar code or RFID]</p>
If found, please return to last named employer (see section ..)

SECTION 1 – Details of the radiation worker

(Normally to be completed by the company or institution designated by the competent authority to issue the radiation passbook)

Surname(s)	[SURNAME] [2 nd SURNAME]	
First name	[First name]	Middle name(s) [Middle names]
Sex	[M/F]	
Date of birth	[date of birth]	<div style="border: 1px solid black; padding: 5px; width: 80px; height: 80px; margin: 0 auto;"> <i>Picture</i> </div>
Place of birth	[Place of birth]	
Nationality	[Nationality]	
Signature	[Signature]	
Unique identification number <i>(unique number in the worker's employer's country, for example :</i>		
	National number	[National number]
	Social security number	[Social security number]
	Fiscal number	[Fiscal number]
Relevant dose limits in country of issuance:		
	Effective dose	[Effective dose/period]
	Eyes	[Equivalent dose/period]
	Skin	[Equivalent dose/period]
	Extremities	[Equivalent dose/period]
	Other	[]

SECTION 2 – Issuing details of the radiation passbook

(to be completed by the entity issuing the radiation passbook)

Radiation passbook number	[Radiation Passbook number]	
Issuing date	[issuing date]	Valid until [expiry date]
Issuing body	[body issuing passbook]	
Address	[address]	Web address [Web address]
Tel number	[tel number]	Mark of endorsement
Fax number	[fax number]	
E-mail	[e-mail address]	

electronic information exchange. Then, starting from 2012, the EC will have the possibility to take this feasibility study as a starting point to look more closely at the technical solutions for such an electronic information exchange system.

Several possibilities were identified:

1. A full electronic exchange of data, in a network, could solve the problems observed with the paper passbook. Indeed, in such a way, all data concerning one worker can be brought together. However, a fully electronic system, preferably web-based to provide access to all actors involved, implies a considerable cost and effort to implement. Data privacy and encryption are important issues. To deal with business processes distributed over a large landscape of existing and heterogeneous systems that are under the control of different owners, an Enterprise Service Bus (ESB) technology in a Service Oriented Architecture (SOA) could be used.
2. Depending on the cost-benefit and risks, other possible options can be distinguished, that will however only solve part of the problems observed : instead of bringing together the data, a magnetic card containing his dose data could be kept by the worker. This would be a somewhat more elegant form of a paper passbook but would probably have the same deficiencies if not completed by an “issuing database”, linking a unique issued passbook/magnetic card to a unique worker.
3. Limiting the centralization of data to solely an issuing database, coupling 1 uniquely identified worker to 1 uniquely identified passbook, is a limitative but also viable option. In this way, Member Countries are free to stick to a paper passbook or to move on to an electronic system, but multiple issuing could be prevented. It is clear that such an “issuing database” is a minimalistic solution. It could be used as a first step, but evolving to a complete electronic exchange is advisable.

Data security is a major issue. Some other issues can also be identified, such as the need for a unique identifier of the worker and privacy-related issues like identification and authentication. A magnetic card (possibly electronic ID-card) could be used as a key for identification purposes.

HERCA also intends to develop a guidance document on implementation and use of the radiation passbook.

8. Conclusions

A model of radiological passbook was proposed by a working group of HERCA on Outside workers and radiation passbook. It includes the harmonisation of terminology and of the requirements on data content, with a distinction between mandatory fields and optional fields. The Radiation Passbook can be a paper based system but countries could also opt to use an electronic (possibly web-based) system instead of the paper based system (or parts of it). The radiation passbook is one of the first major achievements of HERCA, in its aim of harmonisation at the European level. The mandatory data fields are integrated in the draft BSS recast.

The HERCA working group on Outside workers and radiation passbook is currently working on the feasibility of the transition to an electronic data exchange.

9. References

[1] HERCA, www.herca.org

[2] Council Directive 90/641/Euratom of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionizing radiation during their activities in controlled areas

[3] Council Directive 80/836/Euratom of 15 July 1980 amending the Directives laying down the basic safety standards for the health protection of the general public and workers against the dangers of ionizing radiation

[4] Report on the progress to draft a European Radiation Passbook for Outside Workers to meet the requirements of Council Directive 90/641 Euratom,

http://www.herca.org/documents/WG1_OutsideWorkers_report_01_12_2010.pdf