The comprehensive registration and information system of radiation protection regulatory authority in the Czech Republic

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Abstract. The central registration system in radiation protection is created in the Czech Republic since the 1997 year. Since that time the central registries of licensees, ionizing radiation sources (IRS) and worker’s occupational doses has been developed by the State Office for Nuclear Safety (SUJB) in accordance with the demands of the new Czech legislation. The core of this complex information system is created by the Central Register of Licensees (CRL). The Central Register of Occupational Exposure (CROE) and the Central Register of Ionising Radiation Sources (CRIRS) are connected to CRL and provides with the list of workers their doses and relevant sources for each licensee. The Central Register of Approvals (CRA) issued by SUJB has been also created in 2002 and it was implemented into the system. The further register of inspections is recently under development. The whole system is operated in Oracle database. CRL registers all relevant information on the level of licensee, their workplaces and also on the level of smaller working units (labs, buildings, ..) where is necessary for more precise information about the placement of sources. The data are updated continuously. CROE collects personal and dosimetric data for all monitored workers in whole country. This register also includes the information on the personal radiation passports distributed by SUJB to external workers. CRIRS registers sealed IRS, devices with sealed IRS, generators and specification of workplaces with unsealed IRS. Users are obliged to report information on new source specified by Decree on radiation protection within one months. They shall report also all changes of registered data including the transfer of source to another user or to final disposal. CRA enables to issue automatically the licence in unified form and provides users with the different control tools of issued licences. Described comprehensive information system serves as very important and useful tool for effective regulation and control in radiation protection.

1. Introduction

During the years 2002 and 2003 the intensive process of harmonisation of the Czech legislation with the EU Directive 96/29/EURATOM and other directives issued by EU in the field of radiation protection has been initiated. As a part of the legislation modification and improvement, the role of SUJB as a guarantor of the central state registration systems in radiation protection field has been enforced. The recent legislation [1,2] requires in very details specified data from licensees to report to SUJB. The development of the comprehensive registration system started in 1997 with the creation of the CROE [3] and continues through development of CRL and CRIRS to CRA and to first version of Register of Inspections in the beginning of 2004. Fig.1 presents the basic scheme of this registration system.

Fig. 1 Basic scheme of the State Registration System of SUJB
2. Central Register of Occupational Exposure (CROE)

CROE collects personal and dosimetric data for all monitored workers in the entire country. The register keeps the history of workers’ doses and their employment. The licensee shall keep the personal identification and personal doses (including the characterisation of the exposure) of category A workers to their 75 years at least 30 years after the work termination. The licensee reports to SUJB, directly or via personal dosimetric service, the personal data on each category A worker, and the data characterising possible exposure, to the extent and in the form stipulated by SUJB, within 1 month from the start of employment or in case of any change of registered data. The data on personal doses are reported within 2 months of the termination of monitoring period, and the annual overview of personal doses for the preceding year by the end of April of current year. The person who carries out the personal dosimetry must archive the data within one year of the year to which the data are related.

Data registered in CROE has started officially in 1997 year, but where it was possible also previous years (from 1991 year) are included. CROE has registered, during its existence, about 35 thousands workers and 2000 licensees. In a given year, there are active records for about 21 000 workers, and based on the data registered in CROE, it is observed that about 45% of individual effective doses lay below MDL (0.05 mSv in the case of film dosimetry) and the distribution of doses has had a stable trend for five last years (Figure 2). The positive trend could be observed in decreasing of average doses for most exposed groups of workers – industrial radiographers [4] and interventional radiologists. The average dose of all workers is about 0.6 mSv and 1.1 mSv for those with doses over MDL in 2002. Only few cases exceeding 20 mSv and confirmed as really personal dose appeared in the years 2002 and 2003. The dose evaluated as personal and which occurred as the consequence of the exceptional event is registered separately and it is not included in the occupational exposure of worker [5,6].
The overview of the numbers of workers and collective and average effective dose in the year 2002 for main professions group in the Czech Republic

<table>
<thead>
<tr>
<th></th>
<th>Defectoscope</th>
<th>Well-</th>
<th>Works with</th>
<th>NPP</th>
<th>Health care</th>
<th>Control, service</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers</td>
<td>691</td>
<td>47</td>
<td>1454</td>
<td>3534</td>
<td>12384</td>
<td>962</td>
<td>19072</td>
</tr>
<tr>
<td>Collective dose</td>
<td>831.22</td>
<td>128.61</td>
<td>1034.30</td>
<td>810.3</td>
<td>881.49</td>
<td>459.25</td>
<td>9395.45</td>
</tr>
<tr>
<td>Averagedose (mSv)</td>
<td>1.20</td>
<td>1.92</td>
<td>0.72</td>
<td>0.51</td>
<td>0.47</td>
<td>0.48</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Fig. 3

Since 2003 CROE includes, in accordance with new legislation, also separate registration of outside workers and their personal doses received during contracted activities performed in any controlled area. Outside workers are equipped from the beginning of the year 2004 with the personal radiation passport issued by SUJB. The radiation passport consists of two parts, one part is permanent with the possibility of ten years dosimetric results registration and second part with detailed registration of annual doses will be changed every year. During 2003 SUJB has issued 2 050 personal radiation passports.

2. Central Register of Licensees (CRL)

CRL creates the real core of the SUJB registration system. CRL registers all relevant information on the level of licensees (e.g. hospitals, industrial holding companies,...), their workplaces and also on the level of smaller working units (labs, buildings, ...) where is necessary for the more precise information about the placement of sources. The data are updated continuously.

3. Central Register of Ionizing Radiation Sources (CRIRS)

CRIRS registers sealed IRS, devices with sealed IRS, generators and specification of workplaces with unsealed IRS. Users are obliged to report information on new source specified by Decree on radiation protection within one months. They shall report also all changes of registered data including the transfer of source to another user or to final disposal. Manufacturers, distributors, exporters, importers shall report twice per year the list of all SIR handled and distributed by them. The registration of the source is based on the registration of its type and serial number. Registration cards are distributed by SUJB and filled directly by users. They send filled cards to SUJB and data are introduced into the register. Manufacturers, importers, exporters, distributors report to SUJB once per half year the list of the sources delivered. This system serves as a control of the completeness of the register and enables monitoring of the movement of the source during its whole life.
CRIRS is applied for registration of individual sources used in the Czech Republic and monitoring of their movement, statistical evaluation based on the selected parameters of source, information on the placement of sources for fire rescue brigades, information on possible producer of the radioactive waste. Recently CRIRS registers 6,620 generators, 1,016 devices with sealed IRS and altogether 5,830 sealed IRS. About 300 workplaces dealing with unsealed sources are registered too. Approximately 4,800 sources from the total number are classified as important sources in accordance with the categorisation scheme given in legislation [2].

4. **Central Register of Approvals**

CRA enables to issue automatically the licence in unified form and provides users with the different control tools of issued licences. This register is used by all SUJB inspectors. In 2002 SUJB issued 7,500 approvals in radiation protection including the approvals of the special professional competence to perform activities important in terms of radiation protection.

5. **Conclusions**

The Czech legislation, after the harmonisation process, concerning radiation protection of radiation workers fulfil all basic requirements of international recommendations and European legislation. Described comprehensive information system serves as very important and useful tool for effective regulation and control in radiation protection. Many parameters as for example the dose distribution time trends, status and changes in inventory of ionizing radiation sources and status of individual approvals could be surveyed continuously when necessary. SUJB servers also in past several years as a kind of exhibition and training centre of the state registration system and has been sharing the experience with its creation with many trainees and visitors from different countries world-wide.

REFERENCES