



THE EVALUATION OF OCCUPATIONAL OVEREXPOSURES IN THE CZECH REPUBLIC

Z.Prouza¹⁾, K.Petrová²⁾

¹⁾State Office of Nuclear Safety, Prague

²⁾National Radiation Protection Institute, Prague

National Radiation Protection Institute (NIRP), following the world-wide trends, has started in 1993 the realisation of the Central Registry of Occupational Radiation Exposures (CROE). Since 1996 the CROE will be able not only to registrate individual doses for radiation workers in the Czech Republic, but also to estimate collective doses in different occupational categories, to determine and analyse time trends in these groups, to compare exposures for different practices with sources of ionizing radiation (SIR).

The accidental data-base for collection and dissemination information on unusual exposure events in national system of radiation protection will be established as the important part of CROE. The attention of CROE accidental data-base will be concentrated mainly on unintended events, including operating errors, equipment failures, or another mishap, consequences or potential consequences that cannot be ignored from the radiation protection point of view.

The content and form of the information entering to CROE accidental data-base is in principal specified in two parts:

- a cover sheet containing basic information about given overexposure (source of first information, time frame, type of radiation source, type of exposure, workers involved, etc.)
- a narrative account describing circumstances (exposure conditions, equipments, facilities, safety system, what happened), causes (inadequate design, construction, maintenance, written local rules, management, source security, infrastructure, information from the manufacturer, training, failure warning, safety systems, shielding, monitoring instruments, etc), consequences (medical factors, dosimetric evaluation, etc.) of the overexposure.

Record keeping of overexposures is based on two systems:

- if there is suspicion on overexposure at a workplace, licensee is obligated to estimate of the severity of given event; an investigation shall be conducted with the aim of identification of relevant circumstances and to assay and record the relevant doses and their distribution in the body. In the case when the annual limit of the effective dose equivalent ($H_{E,L}$) is exceeded (for internal contamination 1/10 of the $H_{E,L}$), the event must be reported to State Office for Nuclear Safety (its Regional Centers RC SONS). For serious incident (with possible medical consequences) NRPI is involved in evaluation of incident consequences;

- the second system is based on cooperation of CROE with dosimetric services; these services report directly to CROE immediately after the evaluation of dosimeters for given control period any excess of the $H_{E,L}$ (or determined investigation levels). Thus identified events are then investigated by RC SONS directly at the workplace where the event occurred, and the analysis is made of whether a personal dose or false positive reading of the dosimeter is actually concerned.

183 persons were involved during the years 1954 - 1994 in 65 minor accidents and in indicated events detected in the Czech Republic (and former CSSR). 101 of them were exposed to external and 82 to internal radiation. Only 23 involved workers have had some health consequences (dermatitis with skin defects, cataracts). In some events surgical interventions - amputation of fingers, removal of a local deposit were used.

In the period 1975 - 1994, 106 dosemeter readings exceeding the value 50 mSv were reported by the second system (H_{EL}). Following reinvestigation appeared that in most cases the primary evaluation was falsely positive; it was concluded that the values of H_{EL} were exceeded only in 45 of indicated findings.

Several, typical events are described in the presentation mainly from the standpoint of practical utilization for safer use of SIR. Also the analysis of health detriment ("cost") following from indicated overexposures may be important, mainly for the process of justification and optimization of the use of SIR in practice, and could lead to health detriment reduction.