



STATE SUPERVISION OVER RADIATION PROTECTION IN THE CZECH REPUBLIC

Zdeněk Prouza

State Office for Nuclear Safety Prague, Senovážné nám.9, Czech Republic

INTRODUCTION

Presentation is aimed on:

- the organisation of state supervision over radiation protection,
- some aspects of the execution of state supervision over radiation protection domain.

STRUCTURE AND COMPETENCIES OF THE REGULATORY AUTHORITY

By the Act No. 85/1995 State Office for Nuclear Safety (SONS) is an integrated Regulatory Authority of the Czech Republic for nuclear safety and radiation protection with an independent budget and by Law No 18/1997 Cell. - Atomic Law - clearly declared competencies.

SONS above all shall carry out:

- state supervision over nuclear safety and radiation protection, the management of nuclear waste, spent fuel, nuclear materials, physical protection of nuclear facilities and nuclear materials (licensing, inspection systems)
- regulation, evaluation of occupational, medical, public exposure due to practice or source within the practice, i.e. normal and potential exposure (determination of limits, constrains, guidance, clearance levels, etc.)
- co-ordination of the State Radiation Monitoring Network and assurance of the international exchange of information on radiation situation,
- professional co-operation with the International Atomic Energy Agency,
- provide the Government and public with adequate information.

From organisation point of view, three divisions were established in the framework of SONS, headed by Deputy-Directors and one independent department; our Division of Radiation Protection includes Departments of:

- I Radiation Sources and Nuclear Power Plants (RSNPP),
- Exposure Regulation (ER),
- Management of Rad-Wastes and Radionuclides Releases (RWRR).

Radiation hygiene departments of the Regional Hygienic Stations, Prague Hygiene Service and Uranium Industry's Institute of Hygiene at Píbram were transformed into the SONS Regional Centres, located in Prague, Plzeň, České Budějovice, Ústí nad Labem, Hradec Králové, Brno and Ostrava, which are working in frame of RSNPP department. Radiation Hygiene Centre of the National Institute of Public Health in Prague was transformed into the SONS budgetary organisation - National Radiation Protection Institute (NRPI).

LEGISLATION

Due to political and economical changes in the Czech Republic whole legislation experiences an extensive reconstruction - the Act No. 18/1997 Cell. „Atomic Act" was

approved by the Government in December 1995, by Parliament of the Czech Republic in 24 January 1996 and came into force from 1st July 1997. In parallel with the „Atomic Act“ twelve follow-up implementing Decrees were prepared by SONS; The Decrees on:

- Requirements of Radiation Protection (including the problems of Radionuclides Release into the Environment, Radioactive Waste Management and Requirements for Reducing Population Exposures from Natural Sources),
- Quality Assurance during Activities connected with Utilisation of Nuclear Energy, Transportation of Nuclear Materials and Radionuclide Sources,
- Type Approval of the Container Sets for Transports or Storage of Nuclear Materials and Radionuclide Sources,
- Emergency Preparedness of Nuclear Facilities and Ionizing Radiation Sources in Case of a Radiation Accident,
- Organization and Operation of the National Radiation Monitoring Network are particularly important for the radiation protection domain.

The "Atomic Act" as well as these Decrees are based on the internationally adopted principles and recommendations of nuclear safety and radiation protection:

- IAEAIBSS, No. 115/1994,
- ICRP Report No. 60/1990,
- EUDirective 96/29/EURATOM, etc.

The "Atomic Act" and Decrees impose strong obligations upon users of sources, licensees; from standpoint of radiation protection:

a) whoever performing radiation practices shall:

- proceed in such manner that nuclear safety and radiation protection are ensured as a matter of priority,
- ensure that his activities are justified by benefits outweighing risks from these activities, maintain a level of nuclear safety, radiation protection that the risk to life, health, environment shall be kept as low as reasonably achievable,
- perform of intervention if the exposure can approach levels of acute damage to health, or if such measures are expected to provide more benefit than harm;
- reduce exposure of people so that does not exceed the limits
- have an implemented quality assurance system;

b) licensees (for practice by "Atomic Act") above all shall:

- assure radiation protection during all type of relevant practices with the sources for which they are authorized,
- take immediate corrective actions if there are deviations from the approved licence's conditions,
- submit to the SONS relevant (by "Atomic Act") documentation - monitoring and emergency plans, QA/QC programmes, etc.,
- prove to the inspectors that it fulfils all its stipulated duties in assuring radiation protection,
- immediately inform the SONS and the corresponding inspector of serious facts, especially of emergency events which may affect radiation protection,
- implement all measures imposed by inspectors or by the SONS headquarters.

INSPECTION SYSTEM

Three types of inspections and their evaluation are used:

- regional inspections, which are planned and organised by Regional Centres at, by SONS headquarters determined, sources and practices,
- inspections carried out by specialised on given inspection activities (nuclear facilities, uranium industry, nuclear medicine, users of accelerators) groups of inspectors; these inspections are planned and evaluated at SONS headquarters,
- ad hoc inspections (ad hoc inspection group is compiled from inspectors of SONS headquarters and Regional Centres) which are planned and evaluated at SONS headquarters and are concerned on from point of view radiation protection important facilities (NPP, rad-waste storage, large research centres, etc.).

The execution of state supervision of radiation protection (ensured by 47 SONS inspectors for radiation protection) was mainly concentrated in source handling licensing procedures (evaluation of the level of compliance with the limits, conditions and requirements laid down by SONS licences - if the compliance was inadequate, the SÚJB specified requirements and conditions for continuation of given source application, practice) and in the inspections of workplaces where such activities are practised (agenda involved assessment of exposure to natural sources); during 1997 year:

- 315 inspection visits were carried out at licensees in industry,
- 1014 visits at licensees - users of sources for diagnostic and therapeutic purposes in human and veterinary medicine,
- 604 at the other (research, education, services, etc.) users of sources- licensees.

The basic findings of the SONS inspections on radiation protection during the last two years can be summarised as follows:

- problems with implementation of new legislation - new types of documentation, implementation of QA/QC, ALARA programs,
- despite of the privatisation process - the creation a number of small firms with limited personnel, technical and material possibilities - there was no global fall off in the radiation protection culture,
- observance of the principles of radiation sources safe handling by some users has worsened; the area of concern is the sources distribution, since the situation in their records can be considered as somewhat confusing.

During 1995-97 years (i.e. from re-organisation of Czech Radiation Protection) 56 events of the suspected loss of control over sources during transport or dismantling or as suspected theft or violent intrusion to workplaces maintaining such sources were reported. Although no health detriment was identified, radiation principles in some events had clearly been violated. The suspicion was confirmed in 27 events, these, however, were not very significant (the most serious event was the detection 1.5 TBq Go-60 source in a wagon transporting metal scrap - March 1996) from the radiation protection point of view; 29 events were evaluated as unsubstantiated reports, caused by various factors such as wrong measurements of exported metal scrap or the other transported material, measuring instrument malfunction, finding of insignificant radiation sources, and wrong recording.

LICENSING ACTIVITIES

Licensing procedures for practice resulted in 1187 decisions by Regional Centres and 346 decisions issued by the SÚJB Headquarters during 1997 year. The licences mostly covered the handling, use of sources and the type approvals of sources. By the SONS the National register of ionising radiation sources up to now:

- 8740 by SONS licensed X machines are registered,
- 5376 equipment with sealed radionuclides source (106 in medicine; 50 medical radio-therapy units) are working under SONS licences,
- 390 workplaces (47 departments of nuclear medicine) with unsealed radio-nuclides sources are licensed by SONS,
- 7 power and research nuclear reactor units and 6 the other important facilities (with gamma irradiators for sterilisation or producing of radioisotopes) are working.

Central Register of Occupational Exposure (CROE) registers 20,000 workers, which are controlled by the dosimetric services. Time trends of occupational exposure were analysed using data of the CROE; it can be concluded:

- ◆ on medical applications of sources an advance of the number of workers was observed (in the radiodiagnostic it was employed 2000 more persons in 1997 than in 1990),
- ◆ no significant changes of the effective dose (E) occurred, the values fit those ones observed in the developed countries; the average E are (in some occupational groups - radiodiagnostic) slight higher - innovations of technology, appearance of new diagnostic techniques,
- ◆ on the field of industrial applications of sources (beyond the nuclear industry), the number of persons involved in non-destructive testing decreased (mainly due to privatisation of large companies); on the other hand, a new profession emerged, as the repair of SIR and maintenance; the trends in the average E exhibit no significant changes and also are at the same level as in industrially developed countries.

Field	Number of Workers	S [manSv]	E [mSv]	E _{max} [mSv]
NPP	2433	1,28	0,53	20,4
Medicine	10525	9,58	0,91	120
Uranium industry	323	8,25	16,95	45,5
Others	~ 3500	4,26	1,2	26,06

CONCLUSION

The radiation protection in the Czech Republic has been from its beginning and it is up to now based on the same principles as in the other developed countries. It is possible to conclude that from the professional, technical as well as personnel standpoint, it is essentially provided at a relevant level.

Due to changes in the economical and political spheres and in the organisational structure of state administration, the system of the Czech Republic Radiation Protection is now in phase of complete reorganisation:

- new legislative system including ALARA, QA/QC programmes implementation should be introduced into daily practice of ionising sources users,
- new, higher quality licensing and inspection system should be completely introduced and strengthened.