NORM Workplaces – The Current Situation in the Czech Republic

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Outline

- State supervision of radiation protection in the sphere of natural sources in the Czech Republic
- Legal rules
- Measurements, calculation
- Inspection activity of the SONS - NORM workplaces
- Conclusions

Organization of the state supervision in the sphere of natural sources in the Czech Republic

SONS

- state supervision in radiation protection since 1995
- includes natural sources (building materials, drinking water, radon and NORM workplaces, radon in buildings and on construction sites)

Control activities of the SONS

- inspections of building materials, drinking water, radon and NORM workplaces
- 7 inspectors for natural sources
- 170 inspections per year
- routine inspections of radon and NORM workplaces since 2004 (NORM inspections ~ 10 per year)

Legal rules

- Act. No. 18/1997 Coll. (Atomic Act), as amended
- Regulation No. 307/2002 Coll., on Radiation Protection, as amended
- Workers´ exposure at NORM workplaces = occupational exposure according to Art. VII 96/29 EUROATOM (significant increase in exposure due to natural radiation sources)

Legal rules - Atomic Act
Duties of owners of NORM workplaces

- to obtain the measurements of natural radioactivity and to calculate effective doses of workers, keep related records
- to inform the concerned workers about radiation risk
- to perform (optimized) measures reducing exposure
- to inform the SONS about the cases where exposure from natural sources may (for workers) exceed 6 mSv/year
- to permit the release of natural radionuclides exceeding clearance levels under the terms specified in a license issued by the SONS

Legal rules - Regulation No. 307/2002 Coll., on Radiation Protection, as amended

includes the following:

- positive list of NORM workplaces
- records requirements
- measurements and exposure evaluation procedure
- investigation (1 mSv/year, 400 Bq/m^3) and action levels (6 mSv/year → exposed workers)
- workplaces with working time for each worker < 100 hours/year are exempted from the duty of measurements
- clearance levels for solid materials (activity index less or equal to 2; or 600 Bq/kg for radionuclide) and for waste water (gross alpha activity 50 Bq/l for releasing into sewage systems or 0,5 Bq/l for releasing into surface water and gross beta activity minus activity of ^{40}K 100 Bq/l for releasing into sewage systems or 1 Bq/l for releasing into surface water) to permit the release of natural radionuclides; in case clearance levels are exceed, a license issued by the SONS is needed.

Legal rules - Positive list of NORM workplaces

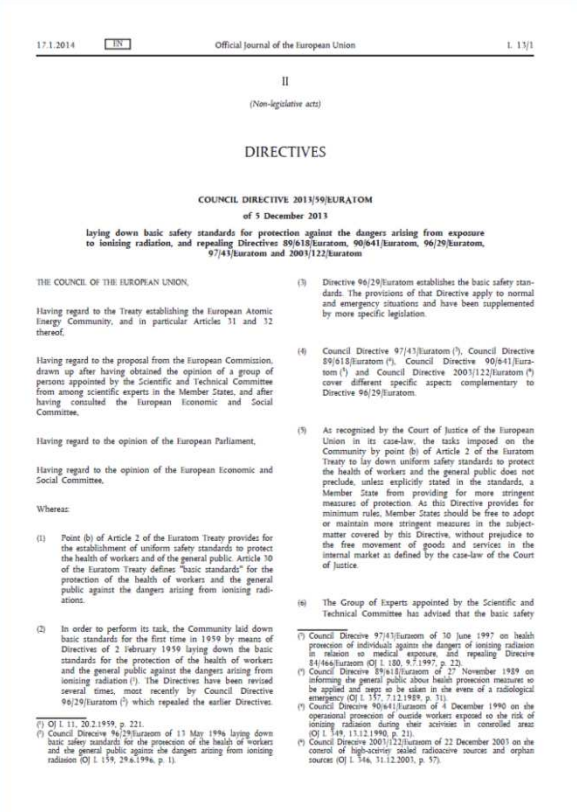
- management of solid products of coal combustion and the production of building materials thereof
- mining, transport by piping and petroleum and gas processing
- phosphate raw material processing
- production and processing of minerals based on titanium
- production and processing of minerals based on zirconium
- processing of raw materials based on rare earths
- metallurgical metal production
- production, processing and utilization of materials containing thorium and uranium (except practices)
- management of products from underground water treatment
- management of materials above the clearance level

Legal rules - 2013/59/EUROATOM Directive

Currently the SONS is working on an amendment of the Atomic Act to implement 2013/59/EUROATOM Directive.

Its demands are going to be newly included into Atomic Act:

- notification of NORM workplaces
- NORM workplaces as part of planned exposure situation
- revision of positive list
- implementation of new clearance levels and general exemption and clearance criteria.



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II

(Non-legislative acts)

DIRECTIVES

COUNCIL DIRECTIVE 2013/59/EURATOM

of 5 December 2013

laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Articles 31 and 32 thereof,

Having regard to the proposal from the European Commission, drawn up after having obtained the opinion of a group of persons appointed by the Scientific and Technical Committee from among scientific experts in the Member States, and after having consulted the European Economic and Social Committee,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the European Economic and Social Committee,

Whereas:

(1) Point (b) of Article 2 of the Euratom Treaty provides for the establishment of uniform safety standards to protect the health of workers and of the general public. Article 30 of the Euratom Treaty defines "basic standards" for the protection of the health of workers and the general public against the dangers arising from ionising radiations.

(2) In order to perform its task, the Community laid down basic standards for the first time in 1959 by means of Directives of 2 February 1959 laying down the basic standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation (1). The Directives have been revised several times, most recently by Council Directive 96/29/Euratom (2) which repealed the earlier Directives.

(3) Directive 96/29/Euratom establishes the basic safety standards. The provisions of that Directive apply to normal and emergency situations and have been supplemented by more specific legislation.

(4) Council Directive 97/43/Euratom (3), Council Directive 89/618/Euratom (4), Council Directive 90/641/Euratom (5) and Council Directive 2003/122/Euratom (6) cover different specific aspects complementary to Directive 96/29/Euratom.

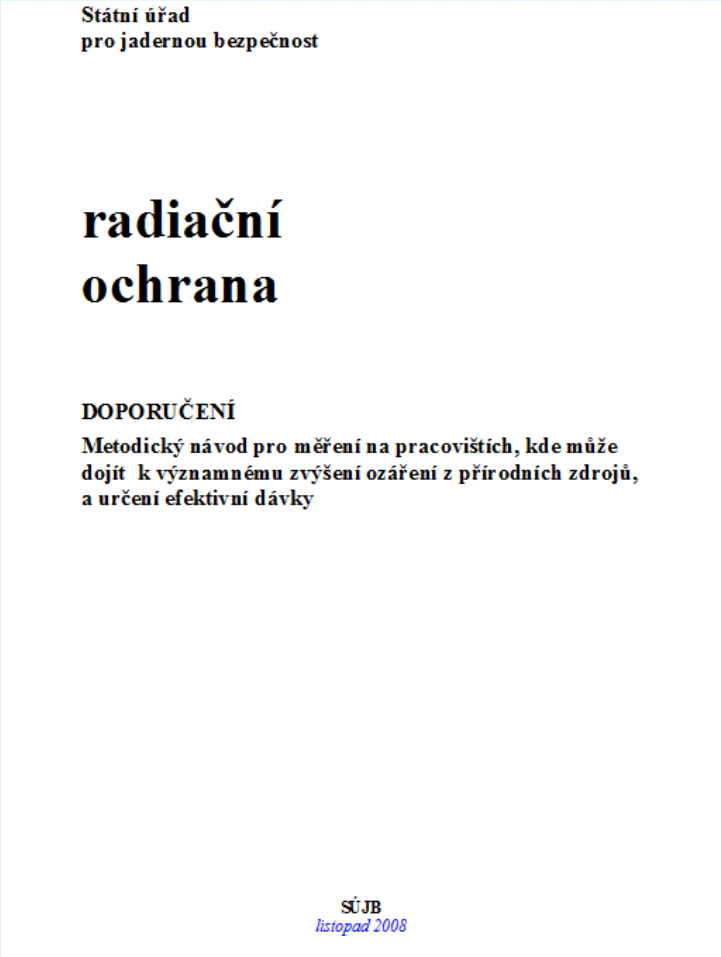
(5) As recognised by the Court of Justice of the European Union in its case-law, the tasks imposed on the Community by point (b) of Article 2 of the Euratom Treaty to lay down uniform safety standards to protect the health of workers and the general public does not preclude, unless explicitly stated in the standards, a Member State from providing for more stringent measures of protection. As this Directive provides for minimum rules, Member States should be free to adopt or maintain more stringent measures in the subject-matter covered by this Directive, without prejudice to the free movement of goods and services in the internal market as defined by the case-law of the Court of Justice.

(6) The Group of Experts appointed by the Scientific and Technical Committee has advised that the basic safety

(1) OJ L 11, 20.2.1959, p. 221.
(2) Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation (OJ L 159, 29.6.1996, p. 1).
(3) Council Directive 97/43/Euratom of 30 June 1997 on health protection of individuals against the dangers of ionising radiation in relation to medical exposure, and repealing Directive 84/466/Euratom (OJ L 180, 9.7.1997, p. 22).
(4) Council Directive 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency (OJ L 357, 7.12.1989, p. 31).
(5) Council Directive 90/641/Euratom of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionising radiation during their activities in controlled areas (OJ L 349, 13.12.1990, p. 21).
(6) Council Directive 2003/122/Euratom of 22 December 2003 on the control of high-activity sealed radioactive sources and orphan sources (OJ L 346, 31.12.2003, p. 57).

Measurements, calculation

- Calculation of workers' exposure (effective dose) methodology is standardized, developed under the SONS guideline and available to on-line access.
- Guideline of the SONS - published in 2007, updated 2008
- Measurements and exposure evaluation can be performed only by a holder of license of the SONS.
- Up to today - 8 licenses issued


Státní úřad
pro jadernou bezpečnost

radiační
ochrana

DOPORUČENÍ

Metodický návod pro měření na pracovištích, kde může dojít k významnému zvýšení ozáření z přírodních zdrojů, a určení efektivní dávky

SÚJB
listopad 2008

Inspection activity of the SONS: NORM workplaces

2004 – 2013: cca 100 NORM inspections

- disposal of filters and waste water from underground water treatment (in case of removing uranium, iron and manganese)
- titanium dioxide production
- coal combustion products processing + production of building materials from these products
- production of thorium wires and electrodes, uranium admixtures in glass
- production of zirconium products (moulds) for foundry industry





RESULTS: NORM workplaces

- The duty of measurements and calculation of worker´s effective doses had not been fulfilled in the majority of inspected workplaces before the inspection.

- Effective doses of workers are low, mostly < 1 mSv/year, always < 6 mSv/year;
  1 exemption - production of titanium dioxide.

- Part of workplaces (e.g. production of thorium wires and electrodes, uranium admixtures in glass) handles to natural radionuclides for a period shorter than 100 hours/year - these were ad hoc exempted from measurements.

RESULTS: NORM workplaces

Releasing NORM materials from NORM workplaces – the activity is often higher than clearance level

- filter cartridges from underground water treatment (removal of U, Fe, Mn, As from underground drinking water) and water used for washing of cartridges
- scales in underground water pipes (spas, mines etc.)
- wastes (plastic filters, scales) from titanium dioxide production
- wastes (scales) from pigging and pipeline maintenance (natural gas transport)

RESULTS: NORM workplaces

Current possibilities of NORM waste disposal (above clearance level):

Wastes with high activity

- disposal to a repository of radioactive waste
  - plastic filters from titanium dioxide production (500 kBq/kg ^{226} Ra, 1000 kBq/kg ^{232} Th) and decommissioned equipment from titanium dioxide production

RESULTS: NORM workplaces

Other solid wastes

- can be used as remediation materials during the remediation of tailing ponds created by uranium extraction
- deposition to landfills;

Legal uncertainties:

- disposal of materials with activity above clearance level on landfills (the Atomic Act vs. the Waste Management Act)
- the SONS aims to encourage this practice
- negotiations between the SONS and the Ministry of the Environment have been started to eliminate these uncertainties

Conclusions

Routine inspections of NORM workplaces since 2004

- quality and well applicable legislation and a guideline of the SONS for measurements and calculation of effective dose
- sufficient number of license holders for measurements and calculation of effective dose
- not enough information about existing workplaces in Czech Republic
- owners of workplaces are not informed very well about their duties as required by the Atomic Act, measurements are mostly initiated only after an inspection

Problem with disposal of NORM waste on landfills not intended for radioactive waste

- we have launched a two-year project which will better define the conditions and rules
- legal uncertainties will be eliminated by negotiations with the Ministry of the Environment and by the implementation of 2013/59/EUROATOM Directive.

Thank you for your attention.

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