STATE OFFICE FOR NUCLEAR SAFETY

Control of natural radon exposure to workers in schools and educational facilities in the Czech Republic IAEA-P-S7-29

Marcela Bercikova, SUJB, Senovazne nam. 9, 110 00, Praha 1

Ivana Fojtikova, SURO, Bartoskova 28, 140 00 Praha 4

Since 1991 the Czech Republic has been dealing with the radon issue in schools. Many measurements have been done under the Radon Programme, schools have been regularly encouraged to measure and, where necessary, to implement protective measures - which may not be costly but can still be very effective. The measurements were voluntary, promoted as a step toward a healthy working environment for staff and students.

Energy saving measures

By 2022, many school buildings have undergone structural modifications that have affected the radon concentration inside the building (typically, for example, by insulating the building, replacing windows or introducing controlled ventilation or air conditioning).
Prior to 2017, control measurements were not taken immediately after renovations to confirm that the established reference level was not exceeded.

Currently (since 2017): Atomic act no. 263/2016 coll., decree 422/2016 coll., Radon action plan (RANAP) www.radonovyprogram.cz/skoly/

Workplace with potentially increased exposure to radon (worktime is higher than 100 hours per year)

The new legislation set new obligations for the subject performing operation of the workplace and for the owner of a school building or educational facility (effective from February 2018) if at least one of the following conditions is met:

- The school building was constructed before 28 February 1991 (before the first radon regulation came into effect), and the school building is located in the defined radon-prone area (RPA),
- The school building has been measured, and the reference level of 300 Bq/m^3 for the radon activity level (RAC) is exceeded,
- The school building was reconstructed, and measuring hasn't been performed to confirm that RAC is lower than the reference level.

Measurement

Measurements for this type of building are provided for free

Communication strategy

Unique website has been prepared to help understand the problem, support registration and enable free measurement to be ordered
http://www.radonovyprogram.cz/skoly/

Operators of the workplace

must comply with the obligations set out in the Atomic Act:

1) to notify information about the workplace to SUJB (to fill in the pre-defined registration form)
2) to arrange for radon measurements and, if the situation requires, determination of the effective dose for employees
3) to inform workers of possible increase of radon exposure

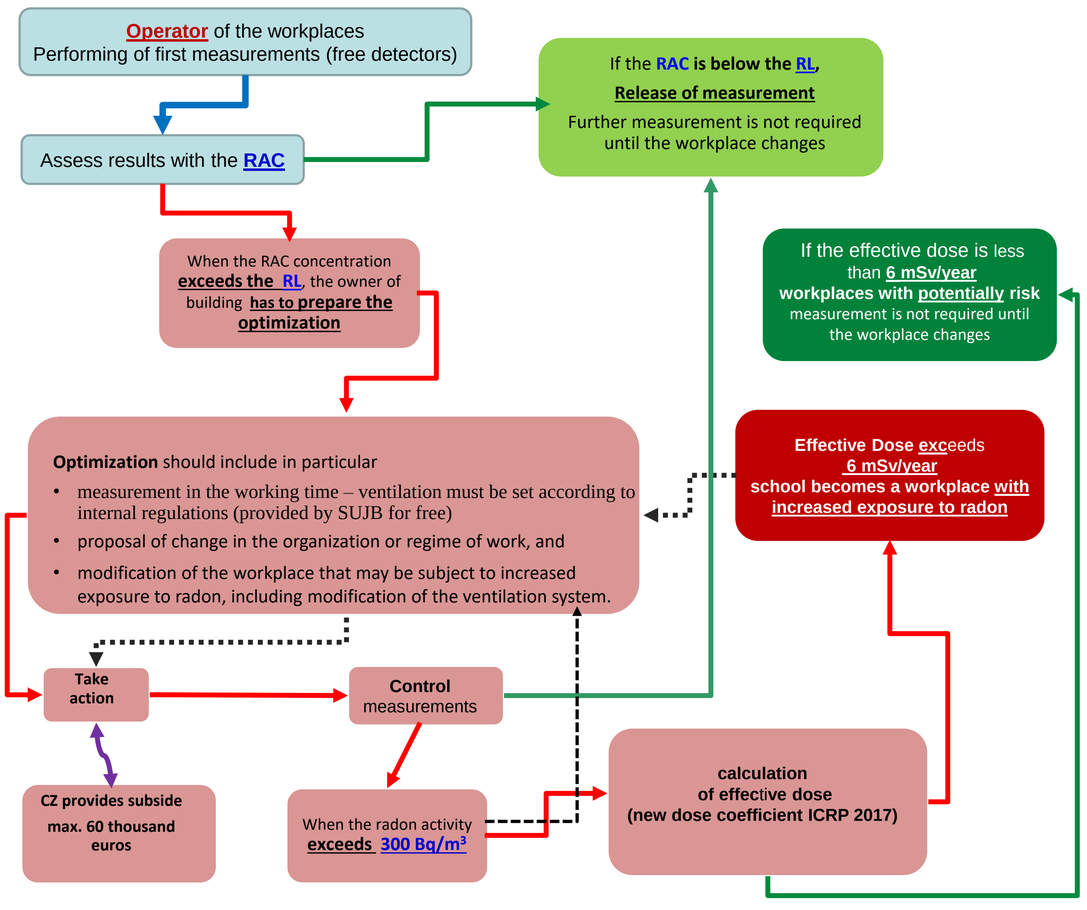
Owner of the school building or school facilities

1) shall ensure measurement of the indoor air activity concentration of radon when comissioning and always after making modifications to a completed building which could affect the indoor air activity concentration of radon, in particular after intervention in the insulation of the building to prevent radon penetration from the subsoil and after modifications that could lead to reduced efficiency of indoor ventilation.
2) If the indoor air activity concentration of radon in a building exceeds the reference level of 300 Bq/m^3, the owner of the building **shall take measures to reduce the exposure to a level as low as reasonably achievable, taking into account all economic and social aspects.**

Process of the control of natural radon exposure to workers in schools and educational facilities in the Czech Republic

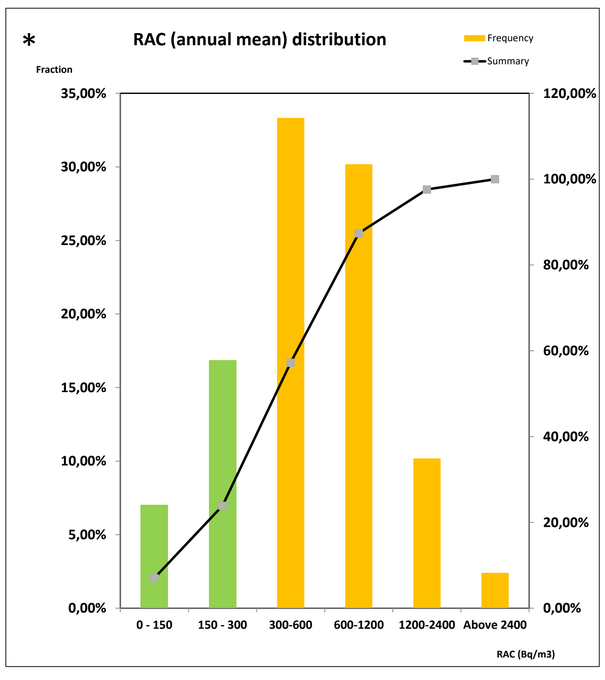
At the workplace with the potential of increased exposure to radon (worktime is higher than 100 hours per year), there Is necessary to perform measurements to assess whether the given reference levels are exceeded

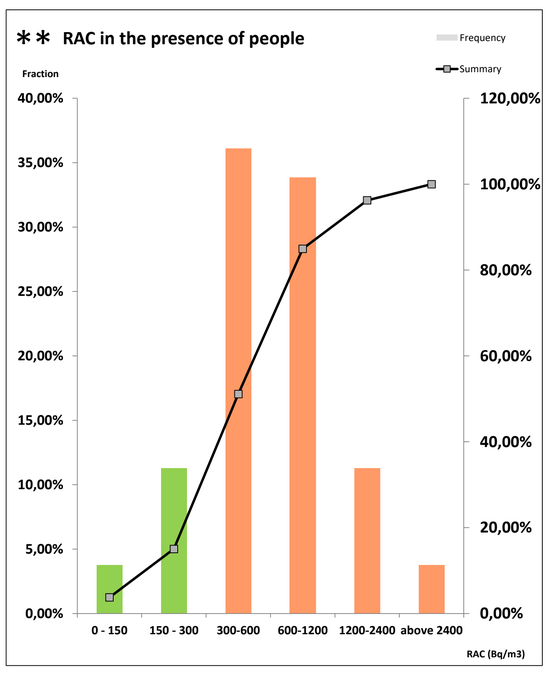
The reference level „RL“
a) 300 Bq/m^3 for the **radon** annual average activity volume concentration **„RAC“** in the air on the workplace
The level
b) **6 mSv per year** for the effective dose,



More than **923** workplaces are registered

- 541 schools are measured (some results are too old to be accepted), On RPAs, only 24 % of schools are bellow the RL. *
- In 67 schools RAC is higher than **1000** Bq/m^3,(maximum value is 5050 Bq/m^3)
- In 118 schools RAC is between 500 – 1000 Bq/m^3,
- In 73 schools RAC is between 300 - 500 Bq/m^3
- **49** schools took subsidies for remediation from 2010
- 15% of the schools selected for continuous monitoring during the stay fall below the RL after adjusting the ventilation to the standards. **





In a workplace that may be subject to increased exposure to radon, where a possibility of exceeding the effective dose value for a worker of 6 mSv over 12 months has been discovered based on repeated measurements, the measurement and determination of the effective dose shall be performed every calendar year.