



Collections of Minerals as NORM Workplace



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Introduction

The recommendation of the State Office for Nuclear Safety "Determination of personal doses of workers at workplaces with material with increased content of natural radionuclide" from 2018 describes procedures for measuring and determining effective doses of workers at workplaces defined according to § 93 b) of Act No. 263/2016, the Atomic Law, as amended. In § 87 of Decree No. 422/2016, On ensuring radiation protection and securing a radionuclide source, in letter a) to s) defined activities that classify workplaces as so-called NORM workplaces (Naturally Occurring Radioactive Material).

In some cases, due to the specific regime of workplace use, it is necessary to use a unique measurement approach to particularize the determination of effective doses for workers at the workplace. One example is the depository of rocks and minerals with a high content of natural radionuclides classified according to § 87 letter p) of Decree No. 422/2016. A dose rate of ambient gamma irradiation is highly variable at different places of this workplace, and the length of workers stay at individual exhibits cannot be precisely defined. Using the average dose rate value at the workplace to calculate an effective dose from external exposure could lead to significant inaccuracies in determining the total effective doses.

Depository of the National Museum in Prague

The world-unique depository is located in a large complex of non-basement buildings and is used to store collections of samples of minerals and rocks. In a special room (approximately 180 m²) with permanent ventilation, exhibits with an increased content of natural radionuclides from all over the world are stored there. The room is secured against the entry of unauthorized persons, each entry and the length of stay of the worker is recorded.



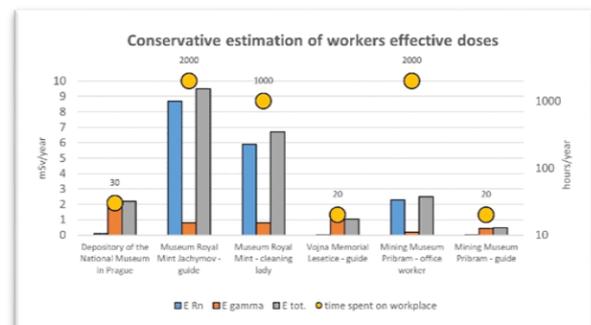
Mining Museum Pribram

The expositions located in historical operational and administrative buildings bring closer the past connected with the mining of silver, uranium and other ores in the Pribram region. Expositions of minerals with a higher content of natural radionuclides are located on the two above-ground floors of the building from 1880. The building is brick, basement, with wooden windows and no forced ventilation.



Vojna Memorial Lesetice

The authentic area of the former War Forced Labor Camp was completely renovated in 2000-2005 and subsequently opened to the public as a museum of the victims of communism. Thematic expositions in period buildings have been built in the area, such as the permanent Uranium exposition in Czech history, indoor and outdoor expositions of minerals with a higher content of natural radionuclides.



Museum Royal Mint Jachymov

The extensive basement dates from the 16th century is equipped with wooden windows and heated by electric heaters. Ventilation is ensured only passively. The permanent exposition of the museum includes, among other, samples of minerals with an increased content of natural radionuclides and products with uranium content, so-called uranium glasses.



Summary

- Workplace operators provide measurements to determine the effective doses of workers from all exposure routes.
- Personal dosimeters H_p(10) for guides → specification of the effective dose from external gamma irradiation.
- Marking of places and exposures with increased dose rate by the symbol indicating the source of ionizing radiation.
- Ensuring the maximum possible ventilation at the workplace → reducing the workers effective dose from inhalation of RnDP.
- Instructed workers → effective doses of workers from external gamma radiation do not exceed 6 mSv/year.
- SONS supervises compliance with radiation protection.
- Due to the short length of stay, the effective dose of visitors will not exceed 0.2 mSv per visit, even at the maximal considered values of radon activity concentration and ambient equivalent dose rate (conservative approach).