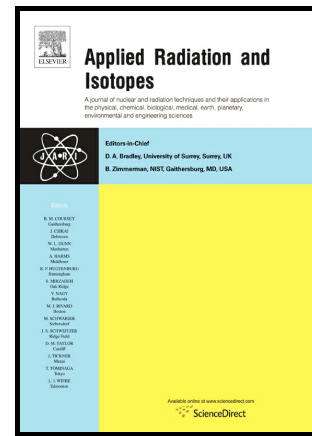


Author's Accepted Manuscript

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www.elsevier.com/locate/apradiso

PII: S0969-8043(16)30901-0
DOI: <http://dx.doi.org/10.1016/j.apradiso.2017.02.047>
Reference: ARI7824

To appear in: *Applied Radiation and Isotopes*

Received date: 2 November 2016
Revised date: 30 December 2016
Accepted date: 14 February 2017

Cite this article as: Amin Shahrokhi, Tamás Vigh, Csaba Németh, Anita Csordás and Tibor Kovács, Radon measurements and dose estimate of workers in : manganese ore mine, *Applied Radiation and Isotopes* <http://dx.doi.org/10.1016/j.apradiso.2017.02.047>

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Radon measurements and dose estimate of workers in a manganese ore mine

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Abstract

In the new European Basic Safety Standard (EU-BSS), a new reference level for indoor radon concentration in workplaces has recommended that the annual average activity concentration of indoor radon shall not be higher than 300 Bq m^{-3} . This paper describes the radon concentration level in an underground workplace (manganese ore mine) over long time intervals (4 years). Several common radon monitors devices – including NRPB and Raduet (as a passive method based on CR-39), AlphaGUARD PQ 2000Pro, SARAD EQF3220, TESLA and Pylon WLX (as active methods) – were used for continuous radon measurements. The output results were used, first, to comprised the result of each device, based on conditions present in underground mines; Second, to have comprehensive measurements about all factors that cause workers exposure to radiation (each monitoring device specified for a unique measurement). The results indicate that the mine's staff had successful efforts to reach the strict requirement of the new EU-BSS, and the average annual radon activity concentrations during the working hours were below 300 Bq m^{-3} in the investigated period. The paper presents the effective dose calculations; applying different equilibrium factors suggested by the literature and calculated basing on our measurements at the site, concluding that the differences could be about threefold.

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