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THE ENVIRONMENTAL IMPACT OF NATURAL RADIONUCLIDES ARISING FROM SOME NON-NUCLEAR INDUSTRIES IN ROMANIA

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Abstract

The objective of this study was to assess the radiological impact on the environment and population of some non-nuclear industries dealing with naturally occurring radioactive materials. Although the amounts of radionuclides in all these materials may be considered quite small, radiation hazards can arise in some working and habitat environments. By the technological processes evolved the concentration of the radioactive substances in the end products, by-products, and wastes it can produce. Likewise, environmental exposure may be significant because the radionuclides in the discharges are often not controlled.
The data of many years of environmental monitoring of radioactivity in the surrounding of ten coal-fired power plants (CFPPs), a phosphate fertilizer plant (PFP) and three oil fields are presented and discussed in this paper.

- Measurements in soil, snow and vegetation had clearly shown the presence of increased concentrations of natural radionuclides (uranium, thorium radium-226 and potassium-40) in the surroundings of CFPPs, particularly for the oldest and most poorly controlled of the plants.
- The influence of PFP in enhancing the environmental natural radioactivity was confirmed only by screening ^{226}Ra in water and soil.
- The high radium-226 content of oil field formation waters could lead to environmental pollution with this radionuclide.

The study provides a scientific basis for decisions on the control of natural radionuclides from non-nuclear industries and on the disposal of their radioactive wastes, even if natural radionuclides occur, into the environment. The radiological consequences of releases of radionuclides following three selected non-nuclear industrial activities are discussed related to further environmental and population risks.

Keywords: radioactivity, natural radionuclides, non-nuclear industries

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