

A proposal of NORM classification system consistent with fundamental principles of radiation protection

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Abstract:

According to IAEA NORM is generally defined, if combine with the definition of radioactive materials included in the same document, as “*material that is designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity, containing no significant amounts of radionuclides other than naturally occurring radionuclides*”. This definition, lying apart from physical or chemical parameters leads to the situation when classification what is NORM or what is not yet varies from country to country. Even among EU members, where the current approach to natural radioactivity is based in broad terms upon that given in EC Directive Euratom 96/29, such situation is quite common that some NORMs just after passed a state border become a completely inert material when consider a content of radioactivity. This is undoubtedly a serious problem facing radiation protection today. IAEA Basic Safety standard as well as European one tries to solve the problem setting limits for NORM expressed as activity concentration. However, *a priori* defined numbers for natural radionuclides assumed to be in secular equilibrium in frame of a decay chain are not well justified and often conflictive when consider other radiation protection rules.

The presented proposal is founded on a calculation of ambient dose rate 1 metre above an unlimited source with combination of certain natural radionuclides enclosed in. The suite of natural radionuclides assumed for calculation let one cover all expected exposure scenarios and reflect the evolution of the radiation risk with progress of decay process. That implies the radionuclides of concern must be analysed directly in NORM of concern but the decay rule makes them possible to be measured concurrently by gamma spectrometry.