

International Conference on the Management of Naturally Occurring Radioactive Materials (NORM) in Industry

VIRTUAL EVENT

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NORM in Venezuelan oil and mining industries: Existing situations and challenges

It is presented for the very first time a summary with the main confirmed cases of NORM and TENORM in Venezuela, which corresponds to the oil and mining industries. This summary is focused on the description of existing situations, including radioactivity concentrations and exposure rates, and also detailed information of each case that can be used to define good practices and safe work protocols within the industry. The vast majority of the analysed data was generated during some recent (2015-2020) efforts which have been specifically addressed to progressively incorporate a proper NORM management perspective: starting with the identification of existing situations and the characterization of NORM, to then promoting the awareness among the managers of the corresponding industries. This last is essential to obtain the support to complete the inventories and to eventually incorporate into these industries suitable practices, policies and strategies oriented to NORM management.

Firstly, we report results from the oil industry. It was observed the formation of highly radioactive scales in used oil production tubes, up to 2.000 Bq/g of Ra, being the IAEA's recommended limit just 1 Bq/g (or 10 Bq/g if there are no contamination pathways). These concentrations are amongst the highest ones reported at global scale, and this case represents the most radioactive TENORM in the country. Secondly, we present results from the first large scale survey made at the red mud accumulation site in Venezuela, where Th and U levels ranges up to 3 and 0.56 Bq/g respectively (also among the highest values worldwide). The feasibility of use this red mud as additive in building materials is analyzed, since it represents the largest volume of TENORM located in the country (more than 25 Mm³). It follows a discussion on Navay phosphate rocks, where U concentrations range from 1 to 5 Bq/g of U. This represent a challenge for the planned exploitation, since these concentrations represent a radiological risk for workers and also will set constrains in the fertilizers production process. Another case of recent interest is the extraction of columbite-tantalite ore (called coltan) from surficial or shallow deposits in Venezuela. The radioactivity concentrations range from low up to 25 Bq/g of U and 3 Bq/g of Th. In all the cases gamma radiation and contamination pathways are evaluated, and we describe the main challenges and needs faced in the way to stablish safe and sustainable management programs for NORM in the national industry.

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