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Determining NORM Residue Management Strategy Using Decision Making Methods

Development of industries such as oil and gas industry, mining and other chemical industries has led to a remarkable increase of Naturally Occurring Radioactive Materials (NORM) discharge to the environment. In this regard, required safety assessment, controls and decontamination are of great importance from the viewpoint of environmental considerations, and radiation protection of public and the workers who are exposed to this kind of waste. Investigations indicate the existence of accumulated NORM in oil industry during the different phases of production and operation. There is a wide range of different industries in Iran which indicates the extensiveness of the activities which lead to generate NORM residue. Since oil and gas extraction is the main NORM producing industry in Iran, in subsequent years, lots of attention has been given to how to manage the wastes produced in related processes and activities. To do so, different options could be considered. Geographical distribution of mines and industries in Iran gives both options of local and central management. Standard and policy of NORM management will be founded on the classification based on the main NORM producing industries and different waste characterizations. In order to outline a NORM management strategy, the studies about regional and geological structures have to be done initially. Oil and gas fields as well as mines have to be inspected respecting the volume of daily produced NORM residues, sampling different environmental media such as water, soil, air, plants and animals as well as related required lab radiation measurements and analysis have to be performed. Afterward, the different pathways of radiation exposure to the public are determined. Many scenarios according to different conditions will be defined; dose and necessary simulations will be run by software radiation safety assessment calculations are done. Finally and based on the results of the calculations and analysis, the practical possible approaches to manage the NORM residues in an appropriate safe manner will be represented. The final decision will be taken based on the output of a decision-making method such as AHP considering technical, economical and environmental criteria.

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