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NORM waste from petroleum industry: an approach for safety assessment of a storage facility for some accidental scenarios during operation

Naturally occurring radioactive material (NORM) in the waste from the oil and gas industry has been object of concern in the last decades. This NORM waste occurs by precipitation or incorporation of the radionuclides in the oil sludge, pipe cleaning, scales inside pipes, vessels, heat exchanger, pieces of pumps, and others. Waste material contaminated with enhanced levels of NORM has to be properly stored and disposed to avoid unacceptable risk to the environment and the public. Final disposal is not available in many countries yet, such as Brazil. Thus, a considerable volume of NORM waste is stored in Brazilian basins. So far in the author's knowledge, there is no estimation for the doses associated with potential accidental scenarios in a storage facility for NORM waste from the petroleum industry. Quantitative safety assessment methodologies are used in many areas of the nuclear industry and involve the evaluation of risk through the definition of scenarios, likelihoods, and consequences, for normal operation and accidents. This paper intends to present the first approach for a safety assessment regarding accidental scenarios in a hypothetical storage facility using the Safety Assessment Driving Radioactive Waste Management Solutions (SADRWMS), implemented in Safety Assessment Framework (SAFRAN) software tool, made available by International Atomic Energy Agency (IAEA). This tool will be used to address the exposures of operators in regular and some abnormal situations. The main goal is to verify the potential risk of a NORM storage facility for the workers and the public in some accidental situations and evaluate possible measures that may be undertaken to reduce their likelihood and risks.

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