

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



Contribution ID: 260

Type: Oral

THE SOUTH AFRICAN NORM INVENTORY AND MANAGEMENT OF WASTE MATERIAL ABOVE RELEASE LIMITS

The paper gives an overview of the South African NORM industry and inventories since the establishment of the National Nuclear Regulator (NNR) in the 1990s. The type of waste generated, their quantities and the activity concentration is extensively discussed. Lastly, the paper discusses the state of the waste storage facilities. The occurrence of NORM in South Africa dates back to the 1915s where gold-bearing ores of the Witwatersrand found to contain considerable quantities of uranium oxide. The large-scale Uranium production in South Africa commenced in the early 1950s and 1970s as a by-product of the Witwatersrand gold and copper respectively. A growing number of Uranium plants led to the establishment of an independent regulatory body, Council for Nuclear Safety (currently known as NNR). Apart from mining and processing of gold, copper, uranium, other NORM-bearing commodities such as phosphate rock, rare earth materials and heavy minerals are regulated. Other NORM regulated industries include fertilizer manufactures, scrap recyclers (i.e. contaminated ferrous and non-ferrous metal, plastic, stainless steel, etc.), laboratories conducting tests on small quantities of NORM-bearing samples for verification of proposed and existing actions and service providers such as storage warehouses and suppliers of clean-up services of radiologically contaminated sites. The industries are issued with two types of nuclear authorisation depending on the associated radiation risk, i.e. the Certificate of Registration (COR) and the Certificate of Exemption (COE) with further consideration. The amount of waste generated varies amongst the different industries with some industries generating insignificant amounts of waste (e.g. laboratories and services providers). The type of waste generated is broadly categorised into homogeneous and non-homogeneous waste. The non-homogeneous waste includes scrap steel, plastic and equipment, which became contaminated on their surface during operations. The scrap steel is released mostly for smelting locally and some internationally while scrap plastic is released locally for smelting. Homogeneous waste includes tailings slurry, waste rock and wastewater that are processed and released in line with the release limits. The slurry is stored in the temporary storage areas called Tailings Storage Facilities (TSF) and waste rock dumps are cleared for release, mostly for use in road construction or stored in heaps called Waste Rock Dumps (WRD). General waste is released to the general waste landfill after thorough clearance. The other type of homogeneous waste such as contaminated soil, sediments, scales and bricks that do not meet the regulatory release limits are stored in individual facilities.

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Session Classification: Session II - NORM Inventories

Track Classification: NORM Inventory