

NUCLEAR ENERGY SERIES

Provisional Title	Policies and Strategies for NORM Residues Management
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1. RATIONALE

It is well known that many industrial operations use or process materials containing natural radionuclides, whose activity concentrations can be significantly enhanced in residues, waste and effluents originated by the particular process. These materials are referred to as NORM, which stands for naturally occurring radioactive materials.

A specific characteristic for many of these industries is that the amount of residues they generate can be very large. Broadly speaking, two main categories of NORM residues can be identified i.e. i) residues with moderate radionuclide activity concentrations but often produced in large amounts (mainly sludge); and ii) residues with higher activity concentrations but usually generated in small amounts (such as scales or filters).

In recent years, the emphasis on creating sustainable economic growth by the promotion of a circular economy has led the industry to make substantial efforts in finding waste prevention and recycling solutions (i.e. adopting the so-called waste management hierarchy). For NORM residues, besides chemicals or other hazardous substances, their radioactive content needs to be accounted for in order to ensure safety in reuse and recycling. Successful examples of NORM residues recycling can be found in agriculture, as soil amendment, in construction or in the metal processing industry. However, large amounts of NORM residues need to be disposed as waste, due to unacceptable concentration of radionuclides and other substances.

As result of the above, a country that wants to deal with NORM management in a consistent way needs, in addition to having in place a proper regulatory framework, identify the industries in its territory that may give rise to such materials; to assess if the residues and wastes that are generated in their operations may need to have restrictions vis-à-vis the radiological properties or if the generated material can serve a purposed according to what has been described above. In case that generated materials are classified as waste and need to be disposed taking into account measures that will entail appropriate protection against ionizing radiation, appropriate disposal routes should exist, options for disposal should be considered and a series of other aspects should also be taken into account, such as the roles of the private and public sectors in disposing the waste and overall strategies to be considered.

2. OBJECTIVE

The objective of this publication is to provide guidance on the elaboration of national policy and strategies for NORM residue and waste management to be adopted at the higher level by IAEA MS. This includes, among other, to determine roles and responsibilities on NORM waste management, basic principles that will guide the proper management of NORM residues and waste, specify infrastructure and other formal requirement for the implementation of sound and sustainable strategies. A policy would be a key element in facilitating the sustainable and efficient management of NORM waste. Strategy(ies) on its turn, can be seen as describing the means (organizational, technical, etc.) to achieve the goals and requirements set out in the national policy.

3. SCOPE

This publication will cover the residues and wastes associated with the following industrial operations: extraction of rare earth elements; production and use of thorium and its compounds; production of niobium and ferroniobium; mining of ores other than uranium ore; the zircon and zirconia industries; manufacture of titanium dioxide pigment; the phosphate industry; production of iron and steel, tin, copper, aluminium, zinc and lead; combustion of coal; production of oil and gas; water treatment. Radioactive wastes generated by operations related to the nuclear fuel cycle will not be dealt with by this publication that will not cover either operation of any type involving artificial radionuclides