

The proposed regulatory approach to NORM management in Brazil

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NORM management in Brazil

Ensuring Safety and Enabling Sustainability



Several conferences have been organized worldwide aiming at promoting sustainable options for the safe management and valorization of NORM residues and wastes (IAEA International Conference NORM 2020, NORM 2022).

The implementation of policies, strategies and an appropriate regulatory framework for a safe and sustainable NORM waste management is a challenge for many countries.

Brazil has attempted to review the national infrastructure to deal in an integrated way, with aspects such as:

- ✓ policy, strategy and regulations,
- ✓ inventory and **valorization of NORM residues (in the scope of the Circular Economy),**
- ✓ disposal of NORM waste and decommissioning of facilities.



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The principle of preventing an undue burden on future generations and environment can be promoted by:



- Good practices for the recovery, re-use, and recycling of waste aiming to minimize the:
 - ✓ generation and disposal of waste
 - ✓ use of land and soil degradation
 - ✓ potential impact on aquifers and the environment
- **Valorization of NORM residues (moving linear to circular economy)** requires investments in infrastructure facilitating circularity of materials and innovations to redesign the processes and services in a sustainable way .
- **CE can be leveraged to achieve multiples UN SDGs** including goals on clean water, on clean energy, on economic growth, innovation and infrastructure, on sustainable consumption and production and on climate change.

NORM management Strategies and Challenges



- To make the valorization of NORM residues a feasible option (in the context of circular economy) **it is necessary to have an appropriate regulatory framework considering the principles of sustainability and safety requirements.**
- Need to take into account existing national legislation and policy on safety, hazardous waste and radioactive waste management.
- Addressing all risks by applying a graded approach.
- Assignment of responsibilities between authorities (Environmental and RP authorities).
- Assessment of national capabilities (industries, technologies, labs., etc.).
- Identification of different NORM streams (NORM inventory and characterization).

NORM management Strategies and Challenges



- Need to promote sustainable options for the safe management and valorization of NORM residues in the **mining sector** improving the knowledge and capacities of participants and stakeholders.

- ✓ In Brazil, the circular management of mining waste has taken place in the design of sustainability.
- ✓ 70% of companies already develop some circular economy initiative.
- ✓ Few initiatives related to NORM residues (it is still of concern to most of the mining industry).

- Decommissioning of **oil and gas assets** (on going and in the future).

- ✓ Using decommissioning materials: criteria for recycling and reusing large volumes of residues contaminated by NORM and
- ✓ criteria for disposal of large volumes of NORM waste in conventional hazardous landfills

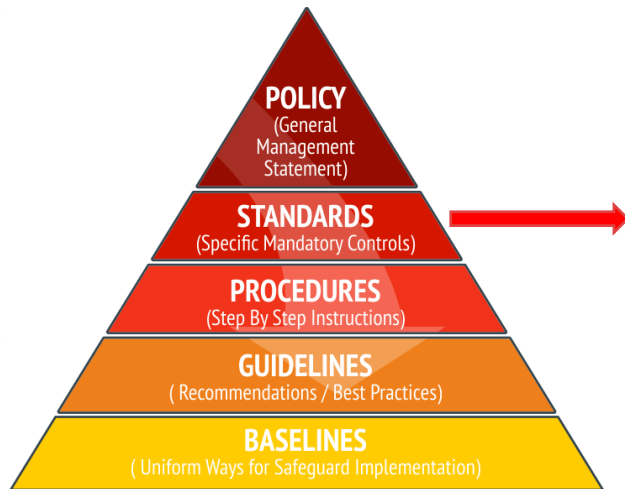
In developing such policy and related strategies, the current Brazilian regulation has been carefully assessed in such a way

Policies & Regulatory Framework

Ensuring Safety and Enabling Sustainability



CNEN NN 3.01 – **Basic Radiation Protection Safety Standard** (final step for approval)



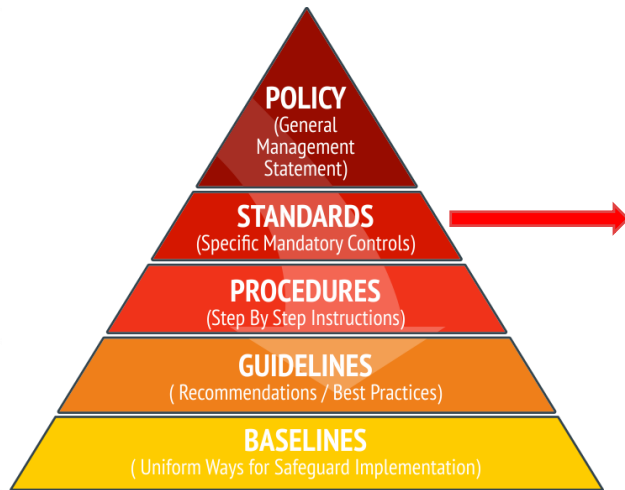
- The Brazilian BSS has been updated aiming to harmonize with the recommendations of IAEA GSR-Part 3 (2014) and ICRP Pub.103 (2007) concerning to:
- Existing exposure situations, which address to post-emergency remediation, legacy sites, exposure to natural radiation and NORM related industries (mining and oil and gas).
- Criteria on waste recovery and recycling observing the principles of sustainability and circular economy, based on the concepts of exemption and clearance (AIEA DS 500 and DS 499).

Policies & Regulatory Framework

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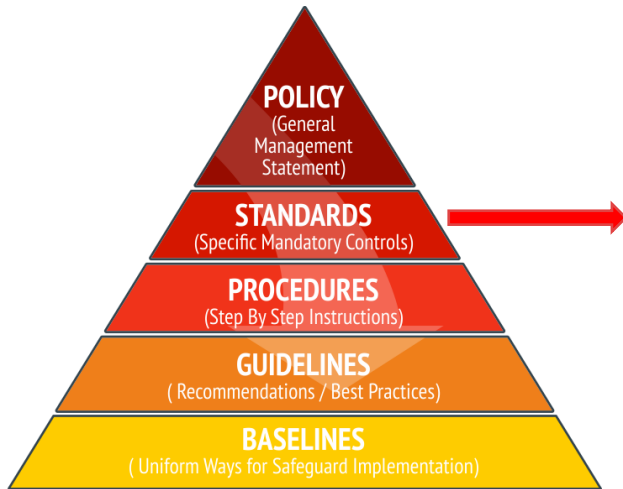
- Generic clearance (1 Bq/g ^{238}U and ^{232}Th decay chain and 10 Bq/g ^{40}K).
- Conditional clearance based on 1mSv/y dose criteria encouraging recycling and reuse solutions and disposal in conventional hazardous landfills (in specific cases).
- Conditional clearance is a tool that can help to build a regulatory system that is both safe and workable.

Policies & Regulatory Framework

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- Graded approach for NORM industries was considered to define different levels of regulatory control, ensuring safety and optimizing regulatory costs.
- Although classified as existing exposure situation regarding radiation protection principles, regulatory requirements for planned exposure situations can also be applied.

In summary



- Implementation of policies, strategies and a regulatory framework for a safe and sustainable NORM waste management is a challenge for many countries,
- It is necessary to have an appropriate regulatory framework considering the principles of sustainability and safety requirements, promoting benefit to the environment, opportunities and optimizing resources,
- Good practices conducting safety and cost-benefit assessments for valorization of NORM residues (in the scope of the Circular Economy),
- Stakeholder engagement and communication with the public,
- A holistic approach in the context of sustainable development, and
- Consideration of societal and ethical values in the context of overall wellbeing (justification principle).

Exploring the interrelationships between safety and sustainability in NORM residues and waste management.



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Thank you!