

# Introduction to Development of IAEA Safety Standards for NORM Residues Management

Stéphane Pepin (FANC), IAEA workshop on the Safe Management of NORM  
NORM IX Symposium, Denver (USA), September 25 - 2019.

# Outline

- IAEA Safety Standards Framework
- Needs for management of NORM residues
- Recommended framework for management of NORM residues in SSD60
- Application of SSD60

# Statute of the IAEA

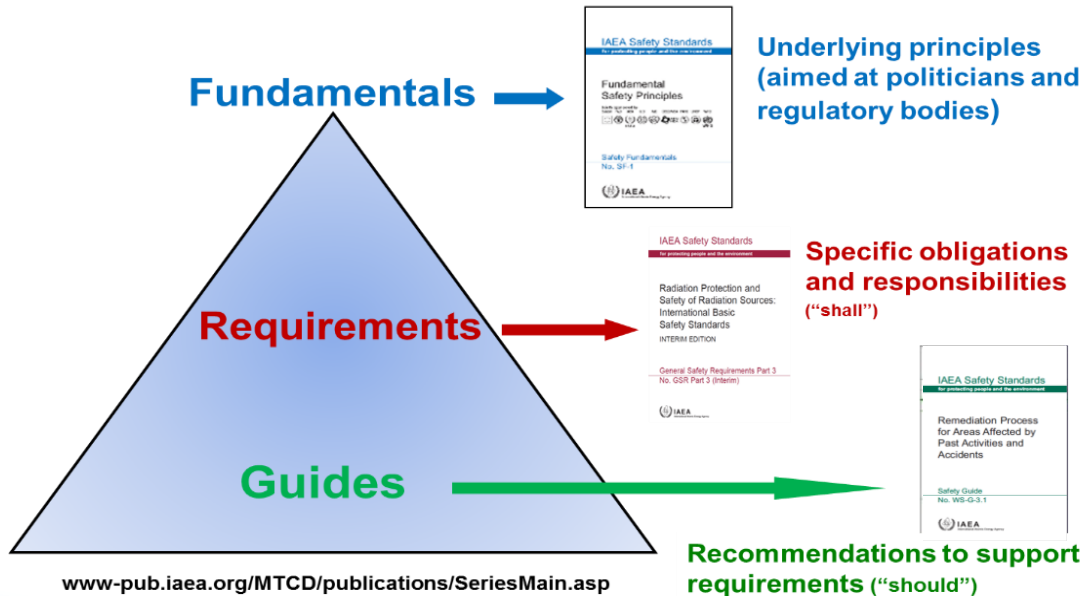
## Article III: Functions

*To make provision, in accordance with this Statute, for materials, services, equipment, and facilities to meet the needs of research on, and development and practical application of, atomic energy for peaceful purposes, including the production of electric power, with due consideration for the needs of the under-developed areas of the world; (Para A.2).*

*To establish or adopt, ..., standards of safety for protection of health and minimization of danger to life and property ..., and to provide for the application of these standards to its own operation as well as to the operations making use of materials, services, equipment, facilities, and information made available by the Agency ... ; (Para A.6)*

# IAEA Safety Standards

## IAEA SAFETY STANDARDS




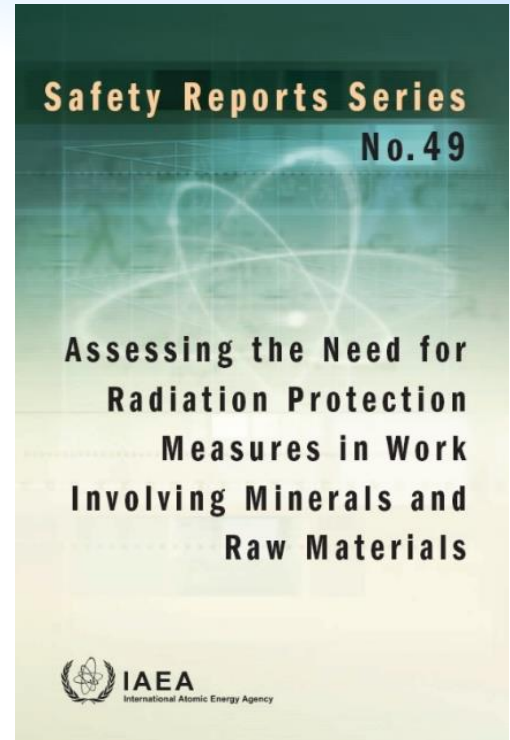
# IAEA Definition of NORM Residues

- **NORM (Naturally occurring radioactive material):** Radioactive material containing no significant amounts of radionuclides other than naturally occurring radionuclides. Significant amounts would be a regulatory decision
- **NORM Residues:** Material that remains from a process and comprises or is contaminated by naturally occurring radioactive material (NORM).
- **NORM waste:** Naturally occurring radioactive material (NORM) for which no further use is foreseen”.
- *A NORM residue therefore may or may not be waste.*

**- IAEA Safety Glossary 2018 Edition**

# Sectors of NORM reside Concerned

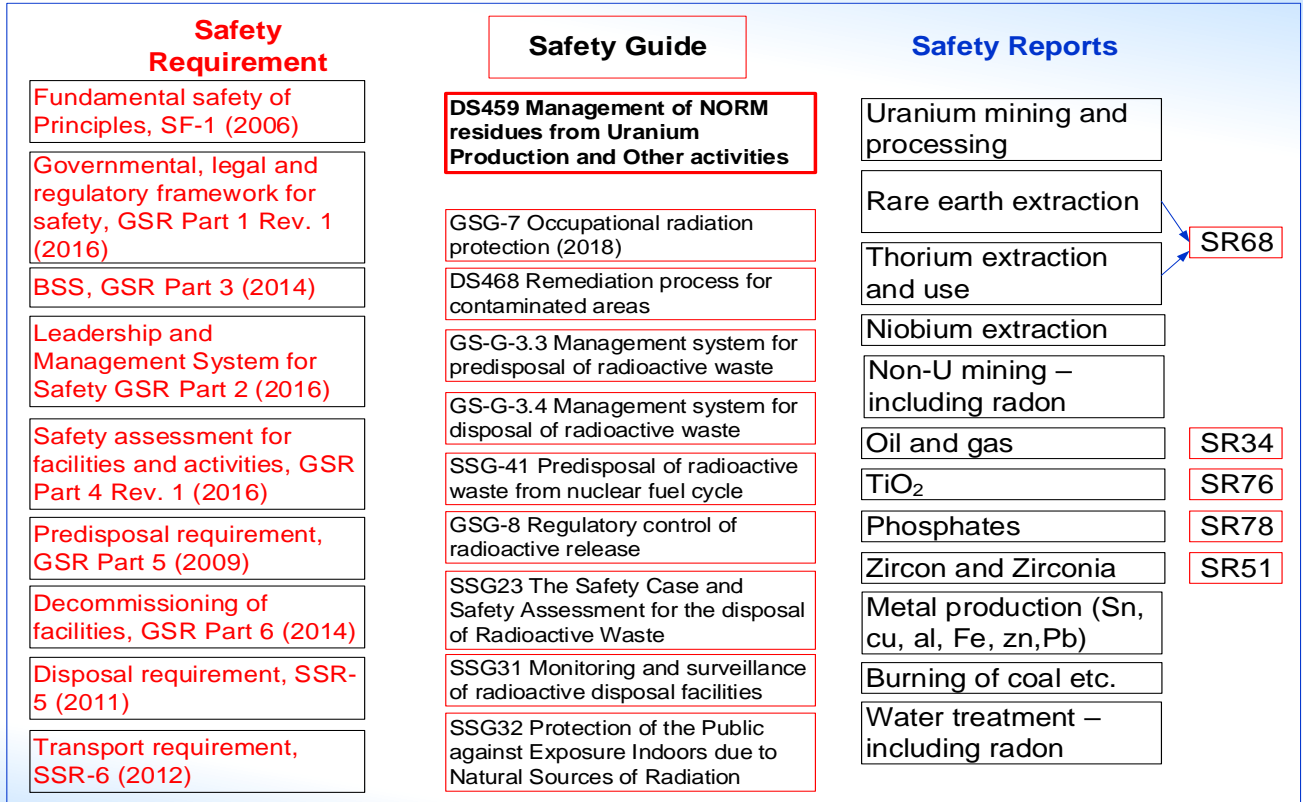
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1. Uranium mining and processing
  2. Rare earths extraction
  3. Thorium extraction & use
  4. Niobium extraction
  5. Non-U mining – incl. radon
  6. Oil and gas
  7.  $\text{TiO}_2$
  8. Phosphates
  9. Zircon & zirconia
  10. Metals production (Sn, Cu, Al, Fe, Zn, Pb)
  11. Burning of coal etc.
  12. Water treatment – incl. radon



# Need of guidance on NORM residues

- Residues from uranium production has long been regulated. WS-G-1.2: Management of Radioactive Waste from the Mining and Milling of Ores (2002)
- Assistance were requested by MSs related to NORM residues through IAEA TC Projects and other activities
- GSR Part 3 Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards establishes requirements on management of naturally occurring radioactive materials

# IAEA Publications relevant to NORM residues



SR68

SR34

SR76

SR78

SR51



# SSD60 Management of Residues Containing Naturally Occurring Radioactive Material from Uranium Production and Other Activities



DS459 Draft 18

Date: 2019-01-09

**IAEA SAFETY STANDARDS**  
for protecting people and the environment

Status : Step 12  
Document for endorsement of the  
draft publication by the CSS

**Management of Residues Containing Naturally  
Occurring Radioactive Material from Uranium  
Production and Other Activities**

**DRAFT SAFETY GUIDE**  
DS459



- WASSC 32 (Nov 2011) and CSS 31 (March 2012) endorsed the DPP
- First review of the draft publication by the review Committees in June 2016
- 120 day Member States consultation completed in December 2016
- The draft was approved by WASSC and RASSC in November 2018 for endorsement of Commission of Safety Standards (CSS) for publication
- It was endorsed for publication by the CSS in April 2019

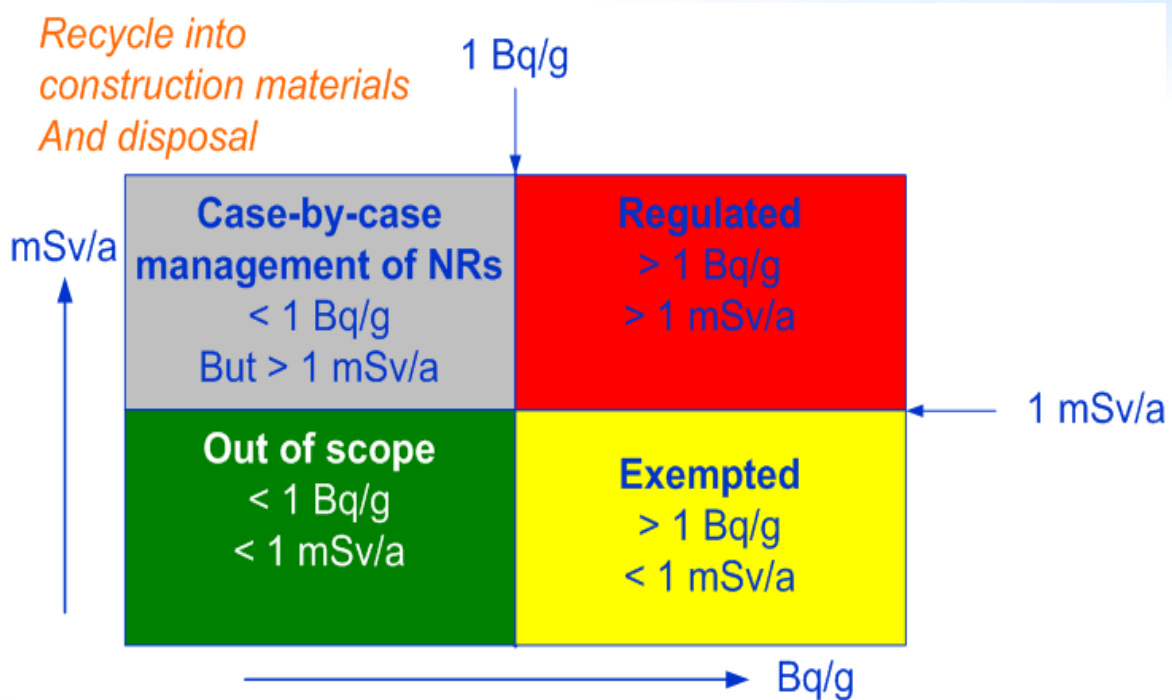
# Scope

- Recommendations and guidance to
  - Regulatory bodies,
  - Operating organizations,
  - Technical support organizations,
  - and other interested parties
- Radioactive residues that arise from mining, and milling of ores for the extraction of uranium or thorium, and to other industries including mining and processing of other ores

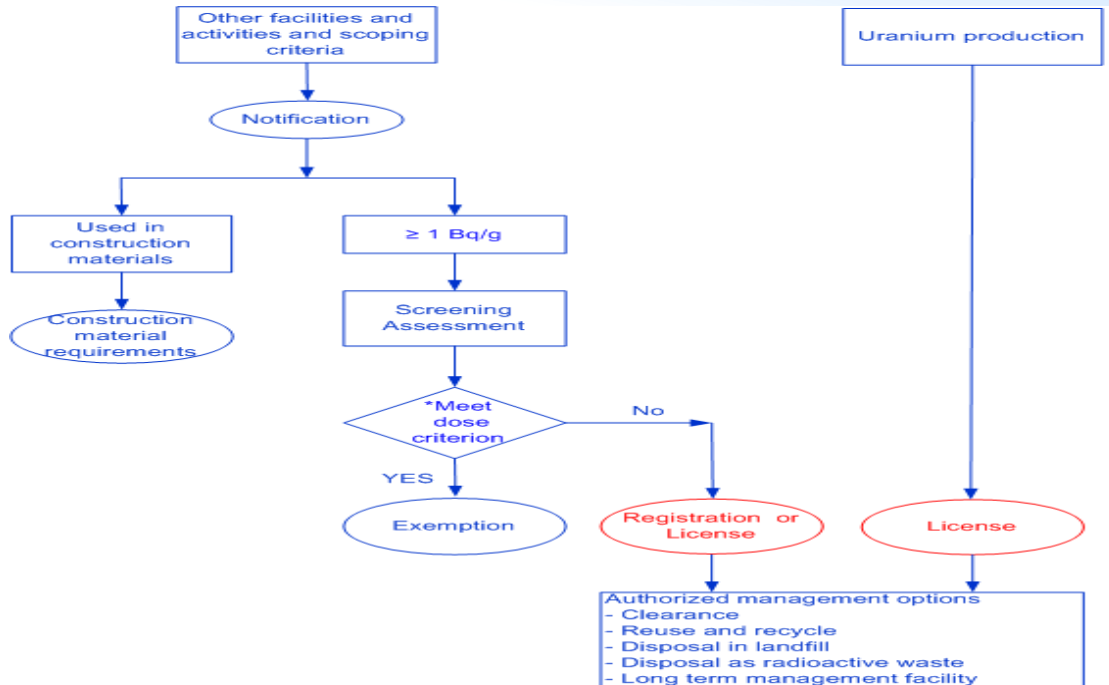
# Structure of SSD60

1. Introduction
  2. Overview of NORM activities and NORM residues
  3. Governmental, legal and regulatory framework for safety
  4. Protection of people and the environment
  5. System for regulatory control
  6. Strategies for NORM residue management
  7. The safety case and safety assessment for NORM residues management
  8. Safety consideration for long term Management of NORM Residues
- Appendix I. Special considerations of residues from uranium production
- Appendix II. Residue management plan for uranium production
- Appendix III. Closure plan for tailings management facility
- References
- Annex I. Examples of residues to be assessed for possible regulatory control
- Annex II. Sampling and determining radionuclide activity concentrations
- Annex III. Example of application of the graded approach in the management of NORM residues
- Annex IV. Reuse and Recycling of NORM Residues
- Annex V. Bibliography

# Management scheme for NORM residue



# System for Regulatory Control



\* Dose criterion can be in the order of 1 mSv/y or other that is defined by the regulatory body.

# Summary

- Management of NORM residues should be justified:
  - Understand origin and characteristics of NORM in the country
  - Establish regulatory framework in a graded approach
  - Develop solutions integrated with existing infrastructure

# Regulatory Forum for Safety of Uranium Production and NORM (REGSUN)

<https://gnssn.iaea.org/main/REGSUN/SitePages/Home.aspx>

*Thank you!*