IAEA 60 Years
Atoms for Peace and Development

Factsheet for Decision Makers

Radiation Protection of Workers

EXPOSURE TO NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM)

Why is it important?

Naturally Occurring Radioactive Material (NORM) is found in many diverse industries, including: mining activities, rare earth extraction, oil and gas production, and the phosphate fertilizer industry. The presence of NORM can result in radiation exposure and associated health risks that are not negligible from a radiation protection point of view. In extreme situations, the doses to workers may approach or exceed the occupational dose limit.

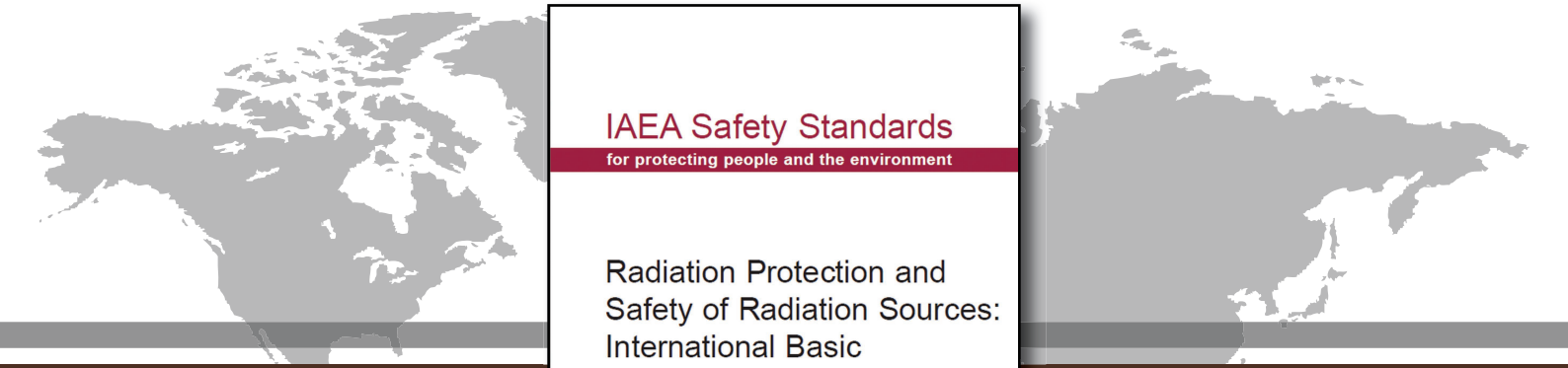
What do I need to know?

Because of potentially high exposures to workers, certain industries involving exposure to NORM may require some form of regulatory control.

The requirements for worker protection apply to NORM industries where the activity concentration of any radionuclide of the uranium or thorium series exceeds 1Bq/g or the activity concentration of potassium-40 is above 10 Bq/g.

Measures to reduce other workplace hazards (e.g., dust and face masks) can be effective in limiting radiation exposure.

In order to adequately protect workers, it is important to minimize both external and internal exposures as part of ensuring overall worker safety.



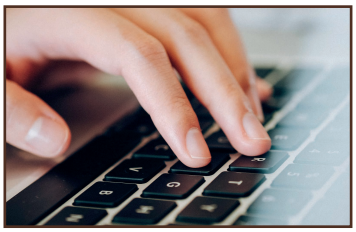
The International Basic Safety Standards (BSS) are the international benchmark for radiation safety. The BSS are used in many countries as the basis for national legislation to protect workers, patients, the public and the environment from the risks of ionizing radiation.

The BSS are based on the most recent scientific evidence on the effects of ionizing radiation and take into account practices and experiences from around the world in the use of ionizing radiation and nuclear techniques. Eight international organizations sponsor the BSS.

What actions are required?

The government is responsible for defining the legal and regulatory framework for radiation safety and protection for NORM.

The regulatory body is responsible for establishing regulations and guides for radiation safety and protection for NORM, and for ensuring their implementation.



The licensee, employer and/or facility operator need to establish and implement a radiation protection program which should be integrated into the overall management system for safety.

The workers are responsible for fulfilling their obligations and for carrying out their duties for protection adn safety.

Procedures for Radiological Assessment

Performing Radiological Assessment

- Assess the radionuclide concentrations of NORM and the corresponding potential internal and external doses

Minimizing External Exposure

- Limit access to areas with high radiation levels
- Consider the use of physical barriers and warning signs in areas containing materials with relatively high activity concentrations
- Consider installing shielding

Minimizing Internal Exposure

- Use ventilation systems for dust control for general occupational safety and for minimizing airborne activity
- Monitor airborne dust and activity levels
- Consider the use of personal respiratory protective equipment for specific tasks

Ensuring Worker Safety

- Provide proper training of the workers
- Use appropriate means for measuring, assessing and recording the doses received by workers
- Establish clear operating procedures
- Have in place emergency response procedures to deal with accidents

Resources

Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, No. GSR Part 3
http://www-pub.iaea.org/MTCD/publications/PDF/Pub1578_web-57265295.pdf
Occupational Radiation Protection Safety Guide

Assessing the Need for Radiation Protection Measures in Work Involving Minerals and Raw Materials, Safety Reports Series No. 49 http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1257_web.pdf

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