



Comparison of occupational exposure provisions for NORM in Zimbabwe to Safety Standards

**1. Legislative and Regulatory Provisions for Naturally Occurring Radioactive Materials (NORM)**

Zimbabwe has observed that several mining and mineral processing facilities fall within the scope of those requiring radiation safety measures to be put in place for nuclear material and other radioactive sources.

The Radiation Protection Act [Chapter 15:15] is the sole act governing NORM in Zimbabwe. Specific NORM Regulations exist, the Radiation Protection (Naturally Occurring Radioactive Materials) Regulations, 2013, is the only regulation responsible radiation safety within facilities that have the potential to elevate radiation levels. In line with international standards the deliberate exclusion of a particular category of exposure from the scope of an instrument of regulatory control on the grounds that it is not considered amenable to control through the regulatory instrument in question is an excluded exposure. Further, the determination by a regulatory body that a source or practice need not be subject to some or all aspects of regulatory control on the basis that the exposure (including potential exposure) due to the source or practice is too small to warrant the application of those aspects, or that, exemption is the optimum option for protection irrespective of the actual level of the doses or risks.

**2. Comparison of Zimbabwe Regulatory Decision Criteria to International Standards**

**2.1. Overview of the comparison**

Regulatory Decision Criteria	International Safety standards	Zimbabwean Regulations
≤1 Bq/g	Excluded from regulation as a practice (i.e., it is not NORM)	Exempt from the requirements of the regulation
>1 Bq/g	Apply graded approach to regulation: - Exemption - Notification - Registration - Licensing	Issue a General or Specific licence No possibility of exemption No provision for exemption or clearance on a case-by-case basis

**2.2. Graded Approach to Regulation**

The regulations do not provide specific provision for graded approach to regulation as there is no possibility of exemption above 1 Bq/g. There is no possibility of disposal or unrestricted release of NORM if dose exceeds 0.25 mSv/a while the international criterion is 1 mSv/a thus possible limitations on NORM waste management options. There are also possible implications in the mining of ores as the definition of

NORM excludes material in which the radionuclide concentration has not been enhanced by human activity.

**3. Dose Limits**

**3.1 Effective Dose**

In the Zimbabwean legislation, doses from indoor radon and its progeny shall not be included in Effective Dose calculations. The use, transfer or disposal of NORM shall be done in such a way as to prevent accumulation of radon in residential structures and other public buildings in concentrations exceeding 0.2 Bq/l and 1.0 Bq/l respectively.

**3.2 Release for Unrestricted Use**

No person shall dispose or release NORM for unrestricted use in such a manner that the reasonably maximum exposed individual will receive an annual Effective Dose more than 0.25 mSv/yr, excluding natural background.

**4. Conclusion**

Zimbabwe regulations with regards to NORM and occupational exposure to some extent meets international standards but must be reviewed to address the highlighted areas in this paper. The regulation should go beyond just establishing that the

1 Bq/g criterion is exceeded. It should consider, in addition, particular types of operation, process and material in more detail, including a prior radiological evaluation of exposure or dose and consideration of the costs of regulation in relation to the benefits achievable.

**5. References**

[1] THE GOVERNMENT OF THE REPUBLIC OF ZIMBABWE, Radiation Protection Act [Chapter 15:15], Harare, (2004)  
 [2] THE GOVERNMENT OF THE REPUBLIC OF ZIMBABWE, Radiation Protection Safety and Security Regulations, 2011 (Statutory Instrument 62 of 2011), Harare  
 [3] THE GOVERNMENT OF THE REPUBLIC OF ZIMBABWE, Radiation Protection, Naturally Occurring Radioactive Materials, Regulations, 2013 (Statutory Instrument 99 of 2013), Harare  
 [4] INTERNATIONAL ATOMIC ENERGY AGENCY, Occupational Radiation Protection No. RS-G-1.1, Vienna, (2004)