

Management of neutron and low- intermediate level gamma Disused Sealed Radioactive Sources (DSRS) (Waste) in Zimbabwe

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Sealed radioactive sources have found many uses which improve human activities and the quality of life of people. In Zimbabwe, a lot of sealed radioactive sources are used in the medical, mining, construction and processing industries. These applications generate radioactive waste that may represent safety and security risks to the environment and people. This creates the need to manage the use and after the lifetime of radioactive materials and waste. The radioactive waste including disused sources must be managed well particular care to radiological, biological, chemical and physical hazards.

There is a need to develop a strong radioactive waste management infrastructure from importation, use and final disposition including regulatory requirements, sociopolitical and economic use. The country policy requires that after the lifetime use of the radioactive sources, they are returned back to the country of origin. However, most of the disused sealed sources can't be sent back to the country of origin, therefore, the country had to develop mechanisms for the management of safety and security before final disposition. This paper describes measures that have been taken by the regulatory body through the help from the International Atomic Energy Agency (IAEA) on managing disused sources in the country. In Zimbabwe, most neutron and low-level gamma sources are used in moisture density measurements for the construction industries. The paper will examine the safety and security risks posed by these disused sealed sources in the developing world where there is minimum radioactive waste management infrastructure or absence thereof. The study will describe the operation procedure, identification of sources, characterization, separation of neutron and gamma sources and measurement of contamination before and after conditioning exercise.

The conditioning process involved twenty-six nuclear moisture gauges (mostly Troxler gauges with fewer other manufacturers). In addition, six Cesium (Cs-137) sealed gamma sources from the radiotherapy were conditioned.

The results will be discussed and presented including suggestions for management of disused sources, new policy approach and development of locally based competence in this regard. Based on measurements and calculations carried out during the conditioning exercise it was found out that radioactive waste management can be met with reasonable costs by implementing a waste management plan using appropriate technologies and expertise fit for developed countries.

Gender

Male

State

Zimbabwe

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