



## MANAGEMENT OF DISUSED SMOKE DETECTORS

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Smoke detectors containing radioisotopes with long half-life (such as  $^{241}\text{Am}$  and  $^{239}\text{Pu}$ ), are widely used all over the world. Very small activities are required for this application but in each country, the smoke detectors are present by thousands.

The volume of the radioactive sources being so small compared to the overall volume of the device, the volume reduction is the only responsible option for their management and storage.

These sources, collected as such, require deep geological repository that so far are not operational anywhere. The conditioning and the packaging should try to meet the requirement for future repository.

The National Institute for Radioelements, in Belgium, (IRE) has acquired a wide experience in the field of handling, conditioning and storage of disused smoke detectors and lightning preventors mainly based on  $^{241}\text{Am}$  sources. Up to now, more than forty different types of smoke detectors were dismantled in the IRE facilities representing a total amount of more than 30,000 items.

This report presents a practical management option for disused smoke detectors sources and provides an example of specific technical procedure for  $^{241}\text{Am}$  sources handling and conditioning for long term storage.

This management option does not request heavy infrastructure. For this reason this practical approach can be implemented in every waste treatment facility including those in the developing countries.