

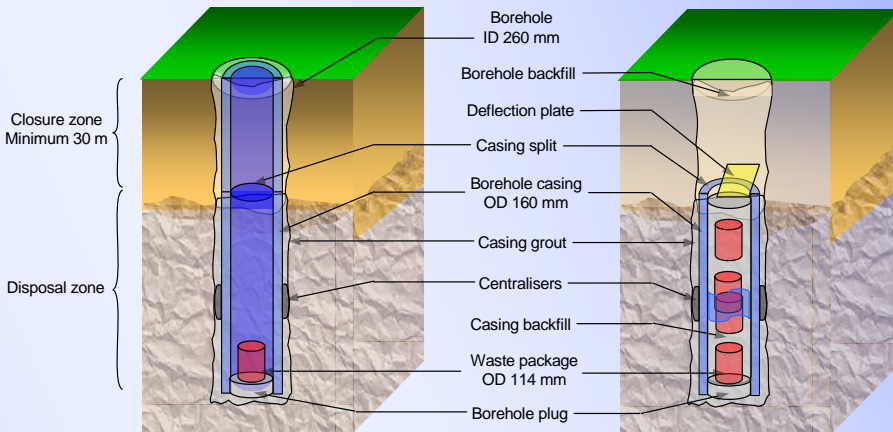


BOSS

(BOrehole disposal of Sealed Radioactive Sources)

What is BOSS?

The **BOSS** system is a safe, simple and cost-effective solution for the management of disused sealed radioactive sources (DSRS). Potentially the BOSS might be adopted to manage effectively small amounts of radioactive wastes. The system consists of: (i) A mobile facility that allows even high activity DSRS to be safely conditioned and packed;



(ii) A disposal borehole with multibarrier system able to confine safely conditioned DSRS. The sources are placed inside two high integrity stainless steel containers (one inside the other, expected longevity of thousands of years) and sealed within a 30-100 metre deep,

specially engineered borehole in the suitable host geological media.

How do we know BOSS is safe?

The **BOSS** system provides safety for the current and future generations to come by (i) isolating the radioactive sources underground so that people will not come into contact with them; and (ii) by using a combination of high integrity stainless steel containers and sealing material to contain the radioactivity for long enough for it to decay to insignificant levels.

Generic safety assessments carried out as part of the IAEA/Necsa project have demonstrated that the **BOSS** concept is capable of providing the required level of long-term safety in a very wide range of geologies and climates.



What are the advantages of BOSS-type facilities?

Borehole disposal facilities have a number of characteristics that enhance waste safety, cost-effectiveness, and physical security. For example, they:



- Isolate the DSRS from the human environment by placing them underground in high integrity packaging to contain DSRS for thousands of years;
- Provide direct and cost-effective access to a suitable geological environment, using readily available technology;
- Require limited land area and limited infrastructure and short period for BOSS implementation;
- Have a small 'footprint' minimizing inadvertent intrusion;

- Require minimal control over the disposal site when the disposal and site restoration have been completed.

What is needed to implement BOSS?

The complete **BOSS** system - pre-disposal and disposal – can only be implemented in a country if there is a strong commitment at the national level. This could be demonstrated, for instance, by a government taking a decision-in-principle to adopt the BOSS system for the management of disused sealed sources.

A national institution, optimally the waste management responsible agency, needs to be appointed as the implementer of the BOSS system. It will employ a series of different specialist teams to perform the various tasks, namely (i) characterizing and conditioning the sources and putting them into storage; (ii) transport of the conditioned sources to the disposal site; (iii) site selection and characterisation; (iv) preparation of the safety case; (v) containerising and disposal; and (vi) borehole construction and closure. Construction, operation and closure of a **BOSS** borehole are likely to take no more than few months. But pre-disposal activities and finding a site and licensing it could take several years, and will be very country-specific.



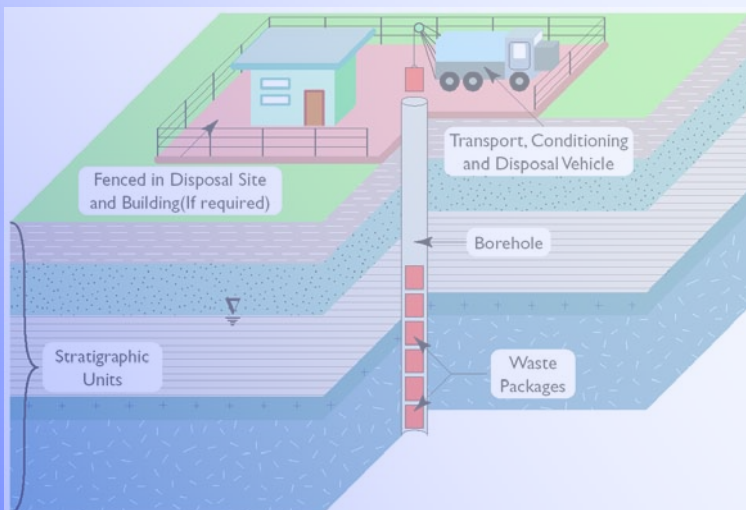
How much does BOSS cost?

BOSS has been designed to use economic, readily-available materials and technology. The total cost of sealed source disposal in a borehole facility is expected not to exceed \$US 1M.

How can the IAEA assist Member States to implement BOSS?

The management of disused radioactive sources is the responsibility of the Member State. The IAEA may through its technical cooperation programmes help the State to decide whether BOSS

would be suitable for implementation in their country and, if suitable, what conditions would need to be met. IAEA may further assist with the deployment of BOSS through advice, training, reviews and the use of equipment and by providing generic design and safety documentation. At the request of a Member State, the IAEA may consider providing assistance in fund mobilization for the implementation of **BOSS**. The IAEA will also facilitate the sharing of information and experience in this field and promote regional cooperation between Member States.



For more information about **BOSS** and the IAEA technical cooperation programmes, please visit the IAEA Website, www.iaea.org, or contact the IAEA Programme Management Officer in charge of technical cooperation for your country, or Technical Officers at Waste Technology Sections.