

IAEA/ANSN International Workshop on
“Sustainable Management of Disused Sealed Sources – Working Towards Disposal”
Chiang Mai, Thailand, 12-16 January 2009

Findings and Recommendations

The workshop covered disused sealed radioactive sources (DSRS) management within the context of “cradle to grave” management, with a focus on storage and disposal. All countries that participated in the workshop are currently facing issues regarding the management of their disused sealed radioactive sources. The complete life cycle management has never been considered systematically as we are still faced with finding a solution to the DSRS disposal problem. Few countries, even the most advanced ones with nuclear power programmes, have licensed and operating disposal facilities accepting DSRS. Most DSRS have no final disposition route.

The workshop had six themes:

- international programmes,
- national policies and strategies,
- storage,
- current status of DSRS disposal in Member States,
- the “BOSS” concept for DSRS disposal
- regulatory aspects of DSRS disposal.

In addition to the above, there were several panel discussions and a session for participants to work in small groups on selected topics.

International Assistance Programmes. A few Member States have international programmes to assist countries with orphan source recovery, source characterization, upgrading of existing storage facilities and construction of new storage facilities. To date the priority for international programmes has been to bring sources under regulatory control including enhanced safety and security, and much has been achieved in this regard in a relatively short period. International programmes have emphasized the need for security culture and putting in place appropriate security measures. Those leading the international programmes are looking for new international partnerships for cooperation.

Policies and strategies for lifetime management of Sealed Radioactive Sources (SRS). Comprehensive policies and strategies for SRS management, in particular policies that require sustainable solutions, are judged to be one of the most effective means for moving forward. The IAEA’s efforts to date on policy and strategy development for radioactive waste management were acknowledged to be helpful. The IAEA is encouraged to continue these efforts and to strengthen them by ensuring that follow-up activities are carried out to monitor their implementation. Participants were of the opinion that plans for obtaining a geological repository in the distant future were weak grounds for delaying the implementation of DSRS disposal.

The safety and security of radioactive sources can only be ensured by commitment to continuous control measures. The implementation of regulatory control of radioactive sources at every stage of their life cycle, i.e. from “cradle to grave” is required in every country. However, an effective and comprehensive “cradle to grave” regime has to extend beyond national borders and requires participation by the international community in ensuring safety and security of radioactive sources. Hence, the importance of international instruments, legally binding or not, such as the *Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management*, the *Code of Conduct on the Safety and Security of Radioactive Sources* and the supplementary *Guidance on the Import and Export of Radioactive Sources*.

The workshop recognizes the IAEA’s role in raising awareness among its Member States through international fora, such as the review meetings under the Joint Convention and the

information exchange meetings under the Code of Conduct, and recommends further development and implementation of national policies and strategies and implementation of the provisions of the Code of Conduct for the “cradle to grave” management, including disposal, of DSRS.

The workshop recommends that Member States address the long-term management of DSRS, in particular disposal, in their national policies and strategies for radioactive waste management, and upgrade their existing infrastructure to safely and securely manage their DSRS.

The IAEA should encourage harmonization of these efforts through international cooperation.

The workshop recognizes the important role of national regulators, and recommends that regulators should play a role in the development of policies, in addition to the development of regulations and safety requirements.

Storage of DSRS. There has been some success with repatriation of DSRS; however, at present many sources cannot be repatriated. Recycling of DSRS has met with limited success. Difficulties with shipment of DSRS have added to the challenges of repatriation and recycling. Hence, in the absence of disposal, storage of DSRS is the norm in many countries today. Decay storage does offer a solution for a limited number of sources. Storage can be safe and secure in the short term but is not a sustainable long-term solution for sources with longer half-lives. The Agency should provide further guidance on the design and operation of storage facilities (i.e., integrating safety and security).

Current status of DSRS disposal in the Member States. In a few countries, certain types of DSRS are currently being disposed of. For example, some US origin sources repatriated to the US are disposed of at WIPP. Certain limited categories of sources are being disposed of in near surface repositories. No country has implemented appropriate disposal solutions for all of its DSRS. The workshop participants encourage MS organizations involved in R&D activities to further pursue their R&D efforts.

The Agency and MS should encourage the implementation of DSRS disposal, to increase the sustainability of SRS usage.

The BOSS borehole disposal system. The system known as BOSS (Borehole disposal of Sealed radioactive Sources) represents a technically complete disposal solution for a significant fraction of the world’s DSRSs. An appreciable body of design, testing and safety-related work indicates that the BOSS concept has much promise as a safe disposal solution. The BOSS concept also appears to offer a sustainable and secure solution for long term management of DSRS. It offers an especially attractive solution for developing countries, where the total DSRS inventory is small. In many of these countries, the complexities of DSRS collection and long-term storage, repatriation, or lack of any disposal options loom large, yet BOSS offers a cost effective and near-term, implementable solution. The BOSS system is suitable to a wide range of geological/climatic conditions. No sophisticated equipment is required to implement BOSS—it can be built using widely available/standard equipment and materials.

The BOSS concept should be promoted as a sustainable, safe and secure solution for the disposal of DSRS.

The BOSS concept should be further supported by a standardized cost methodology.

The IAEA should pursue its support towards implementation of the BOSS system in Ghana and, using it as a pilot project, pave the way for the disposal of DSRS elsewhere.

Member States with developed skills and experience in radioactive waste disposal should assist the implementation of BOSS disposal technology in Ghana and other candidate countries.

The IAEA should identify potential candidate countries for the development and implementation of BOSS disposal facilities in different regions, e.g. Asia, Latin America.

The IAEA and Member States should strengthen cooperation on strengthening the infrastructure for safe and secure DSRS management, in particular storage and disposal, in developing Member States.

Need for flexible disposal solutions.

The IAEA should consider extending the scope of the borehole approach to allow for the disposal of a wider range of DSRS (e.g., sources already conditioned in larger diameter packages).