

/opt/indico/archive/2016/C106/696174836259

_CN_242_icon.jpg

Contribution ID : 213

Type : Oral

Borehole Disposal of DSRS in Brazil

Abstract content

The safe management of disused sealed radioactive sources (DSRS) is presently a concern of the government of many countries, as well as the IAEA because many of these sources have potential to cause severe radiological accidents and because a pathway that will eventually lead to their disposal as a radioactive waste is so far mostly unavailable.

Brazil is currently one of those countries. The Brazilian inventory of sealed radioactive sources (SRS) includes about 15,630 DSRS, with total estimated activity of 1 PBq stored in centralized waste management facilities and about 7762 SRS still held by the users, with total estimated activity of about 0.2 EBq. When the ²⁴¹Am sources removed from radioactive lightning rods and ionic smoke detectors are included, the number of stored DSRS amounts to about 190,000. The total activity figure is unchanged, however, because these are low-activity sources.

Although the project of a near surface repository for LILW is still in the site selection phase, the inventory of DSRS stored in Brazilian facilities consists of alpha-emitting, long-lived radionuclides such as americium and radium. Besides, the inventory has a large number of sealed sources of short-lived radionuclides (e.g. ³H, ⁶⁰Co, ⁸⁵Kr, ⁹⁰Sr, ¹³⁷Cs). However, depending on the strength of the source, many of them may not meet the waste acceptance criteria for near surface disposal. Consequently, another disposal technology, a deep borehole repository, is being considered.

The Nuclear and Energy Research Institute (IPEN) in Sao Paulo, Brazil, developed a concept of borehole disposal in the early 2000s. However, during a TCP with the IAEA in 2014-2015, with the participation of staff from other institutes of the Brazilian Nuclear Energy Commission (CNEN), project team chose the BOSS concept developed by NECSA, for further consideration. While the IPEN concept has still a long way to go in terms of detailed engineering, preliminary safety assessment and quality assurance documentation, the BOSS technology is now ready for implementation, with technical support from the IAEA. The paper will present the results of the work performed by the TCP team and the prospects for the implementation of the disposal of DSRS in Brazil, with an emphasis on the safety aspects of the endeavor.

Country or International Organization

Brazil

Primary author(s) : Dr. AGUIAR, Lais (Brazilian Nuclear Energy Commission)

Co-author(s) : Dr. CARVALHO FILHO, CARLOS ALBERTO DE (COMISSÃO NACIONAL DE ENERGIA NUCLEAR - CNEN/CDTN); RIOS, Francisco Javier (Nuclear Technology Development Center); SCHENATO, Flávia (Brazilian National Nuclear Energy Commission); Dr. VICENTE, Roberto (Nuclear and Energy Research Institute); SANTOS COTA, Stela Dalva (CDTN/CNEN); Mr. FERREIRA, Eduardo Gurzoni Alvares (Nuclear and Energy Research Institute); GHARBIEH, Heidar K. (Nuclear Technology Development Center); HIROMOTO, Goro (Nuclear and Energy Research

Institute); MARUMO, Júlio Takehiro (Nuclear and Energy Research Institute); PEREIRA, Igor Tensol Rodrigues (Nuclear Technology Development Center); PRATES, Sônia Pinto (Nuclear Technology Development Center); RODRIGUES, Paulo César Horta (Nuclear Technology Development Center)

Presenter(s) : Dr. AGUIAR, Lais (Brazilian Nuclear Energy Commission)

Track Classification : Disposal of Disused Sealed Radioactive Sources