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An analysis of the information flow from disused sealed sources in radioactive waste management

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1. Introduction

Ensuring that information on nuclear technology and its applications and also information about nuclear materials are properly preserved and accessible is an essential task for appropriate radioactive waste management and for building the trust of the general population and any interested parties. With the proper management of this information, risks are minimized and costs associated with unnecessary technical procedures are reduced or eliminated. As an example, the existence of proper records of nuclear materials, especially of disused sealed sources, is essential to reduce the possibility of accidents like the one occurred in Goiânia in the late 1980s[1]. Considering that these nuclear materials are used on a large scale in medicine, agriculture, industry and in research centers with the final disposal being the responsibility of the CNEN institutes, correctly managing the information on these sources from their production and commercialization to final disposal is prerequisite for the management of these radioactive wastes[2]. With this in mind, this work presents an analysis of the information flow produced and to be preserved and eliminated during the useful life of the sources, including between the different custodians.

2. Methodology

This work is mainly based on the analysis of national legislation and regulations on radioactive waste management. Additionally, the information flow to sealed sources currently adopted by the Radioactive Waste Management Service of the Institute for Energy and Nuclear Research (IPEN/CNEN) will be used as an essential source of the adopted practices. This data will be analyzed under archival principles, in order to suggest procedures for the proper organization and preservation of this type of information, in an integrity and reliable way during its life cycle.

3. Discussion

Unlike other nuclear materials, sealed sources have a possibility of objective tracking from their production in cases where the processes defined by regulatory control are respected. Therefore, it is possible to define what types of information should be preserved and transferred along the sources' chain of custody.

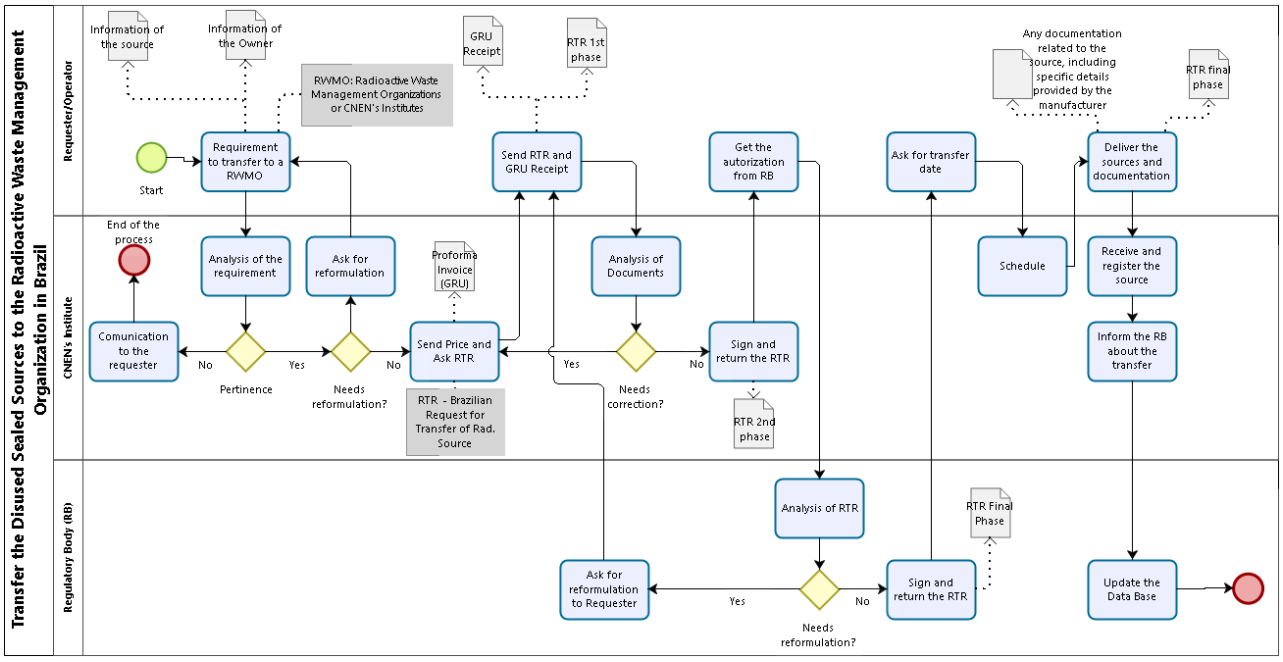
This information, when produced and received during the activities of people or institutions related to the sources, is translated into records, regardless of its form or record support. In Brazil's area regulation, part of these records may be sent with disused sealed sources when they are collected in repositories, a role

that is currently the responsibility of CNEN's institutes. These records, once under the protection of a public institution are clearly subject to national archival legislation. In this way, their definition as records and, in this case, public records, is essential for their proper understanding and treatment, considering the management of radioactive waste.

Information referring to not only production and supplying, but also transportation and whether the source is still in use for example, must be controlled. Any sources that do not have an understandable level of control, i.e. orphan sources, can present risks overall.

When thinking about the problem related to disused sealed sources, there are two issues necessary to consider: one related to the control of information from all sealed sources through an inventory, normally under the responsibility of the regulatory body; and another aimed at individual control of sources through processes that involve all actors, from producers, suppliers, users, to the waste managers responsible for final disposal[3]. The information generated from the second issue, properly managed, will serve as evidence supporting in a secure way, the information to be controlled by the national inventory.

With the analysis of this flow and subsequent discussion that addresses the two presented issues, its possible implementation would present greater benefit to the management of these wastes produced since then. Anyway, once defined, the flow could also help in the management of sealed sources that already exist at any stage, including for disposal. Since certain information from the past may have already been lost at some level, it is necessary to search, in the records of the actors involved in the chain of custody of the sources, data that can support the reconstruction of this informational framework, provided that it is justified in terms of cost and risk. The faster these issues are discussed and defined, the greater the scope of information on existing sources.



For some illustration, the process above describes generally the actions and information related to the transference of disused sealed sources to the institutes responsible to handling, conditioning and storage them. This process is internally ruled by the radioactive waste management organizations norms and by “Licenciamento de Instalações Radiativas” - Norma NN 6.02 - from CNEN when is related to the effective transfer of the source.

The information of the source at the beginning of the process is only for estimate the costs. More information about the sources, including the specific details provided by manufacturer, could be presented in

this moment. It would help the analysis from the radioactive waste management organization to estimate the costs, the equipment/tools and personal competencies to manage the waste. It may also help to establish a repository with the technical specifications of these sources for future use in cases where this information is not provided.

3. Conclusions

The areas of records management and radioactive waste management have an intrinsic connection, not only because of the similarity with which they treat their objects, but predominantly because of the role of information in the management of radioactive waste in the short, medium and long term. In the case of disused sealed sources, the process is no different. As these are nuclear materials that have traceability since their production and commercialization, we understand that an analysis of the current system and a proposal with recommendations for the management of sources and their information is a benefit at all stages, for all actors, until final deposition.

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