

## **Radioactive lightning rods waste treatment**

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### **Abstract**

In this paper, we present alternative processes that could be adopted for the management of radioactive waste that arises from the replacement of lightning rods with attached Americium-241 sources.

Lightning protectors, with Americium-241 sources attached to the air terminals, were manufactured in Brazil until 1989, when the regulatory authority overthrew the license for fabrication, commerce, and installation of radioactive lightning rods. It is estimated that, during the license period, about 75,000 such devices were set up in public, commercial and industrial buildings, including houses and schools.

However, the policy of CNEN in regard to the replacement of the installed radioactive rods, has been to leave the decision to municipal governments under local building regulations, requiring only that the replaced rods be sent immediately to one of its research institutes to be treated as radioactive waste. As a consequence, the program of replacement proceeds in a low pace and until now only about twenty thousand rods have reached the waste treatment facilities.

The process of management that was adopted is based primarily on the assumption that the Am-241 sources will be disposed of as radioactive sealed sources, probably in a deep borehole repository.

The process can be described broadly by the following steps: a) receive and put the lightning rods in initial storage; b) disassemble the rods and pull out the sources; c) decontaminate and release the metal parts to metal recycling; d) store the sources in intermediate storage; e) package the sources in final disposal packages; and f) send the sources for final disposal.

Up to now, the disassembled devices gave rise to about 90,000 sources which are kept in storage while the design of the final disposal package is in progress.

**KEYWORDS:** *radioactive waste; Americium-241; waste treatment; waste management.*