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RADIOACTIVE WASTE EVACUATION OF THE SOURCES OF A LOW DOSE RATE BRAQUITHERAPY UNIT

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Presentation preference: Poster Only

Major scientific thematic areas: TA7 - Waste Management and Decommissioning

INTRODUCTION

The second class Radiactive Instalation start-up authoritation makes responsible for its security to the instalation exploiter and supervisor. The especifications established in the authoritation, which are mandatory , point out several actions, some of these actions are the hermeticity tests of radioactive sources an radiologic controls of environment dosimetry. It is necessary to optimize the time spent in each activity, managing them as reasonably as possible. An important matter to take into account is to keep and control only those radioactive or radiological equip ment which , even if are in work, have an appropriate performance for the patient treatment

MATERIAL AND METHOD

“La Paz” hospital has an intracavity braquitherapy (LDR), Curiatron model. The Radioproteccion Department proposed to remove from service the unit due to its age , this was carried out by the Commission of Guarantee and Quality Control. There were different solutions taken into account to decomission the unit, finally the option chosen as the most convenient for the instalation was to manage directly the withdrawal of the radioactive material which consisted of seven Cs-137 probes model CsM1 and total nominal certificated activity of 7770 MBq (210 mCi) dated in May 2005. It also has to be considered as a radioactive waste the inner storage elements of the Curiatron and the transport and storage curiestock, built with depleted uranium. To accomplish this aim an evacuation container was designed consisting of an alloy of low-melting point (MCP96), which fulfills the transport conditions imposed by ENRESA (Empresa Nacional de Residuos Radiactivos, S.A). A theoretical calculation was performed to estimate the thickness of the shield which adequates to the rate of dose in contact demanded. Accuracy of these calculations has been verified using TL dosimetry.

RESULTS

The radiation levels during the extraction intervention of the radioactive probes and its transfer to the evacuation container, with the seven probes in their plastic stands, reach 2.5 mSv/h at a distance of 50 cm. The TLD dosimetry performed on the top of the container has an average value of 1,11 mSv/h in contact. The theoretical calculation shows 1.6 mSv/h. We understand that the difference is due to the formulism used in the calculation of the building factor.

CONCLUSION

Removing from service encapsulated sources as a solid radioactive waste can be performed in an easy way from the Radioproteccion Department. The theoretical calculation of the evacuation container has been compared to experimental TL measurements to prove the rate of equivalent dose levels demanded by ENRESA. The comparison of the economic evaluation of several procedures supports the election made in the management of the evacuation process.

Key words. Radioactive wastes.