

A Study of Radioactive Liquids Discharges from the Medical Facilities DGIES/ITN-DPRSN

Contract nº 6/01

R.Trindade, I.Paiva, L.Portugal

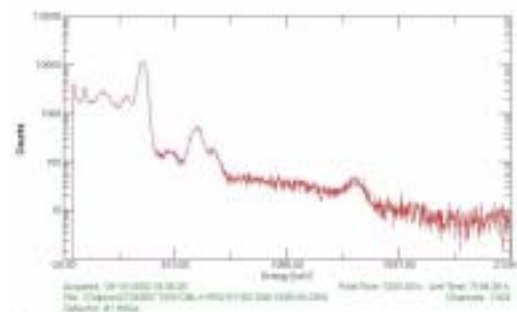
Objectives

This Contract-Project was signed between General Directorate for Health's Facilities and Equipments (Direcção Geral das Instalações e Equipamentos para a Saúde, DGIES) and Nuclear and Technological Institute/Radiological Protection and Nuclear Safety Department (ITN/DPRSN). The main objectives of the study were to collect samples in order to identify and quantify, by gamma spectrometry, radioisotopes used in the main State medical establishments in the Country as well as to assess their radioactive waste management systems. The final output consisted of an overall critical analyse of all collected information including advising the administration of public hospitals and the Ministry of Health on how to improve the radioactive waste management strategies already in place and/or how to implement new and better policies that will support the enforcement of regulations and good practices.

Results

The main properties of some radionuclides strongly contribute for their application in medicine, both for diagnostic and therapeutic purposes. The demand for the use of sealed radiation sources and unsealed radionuclides is still increasing every year and, as consequence, there is an urgent need in identifying more efficient treatment and interim storage technologies of the associated radioactive waste. The increasing costs of the disposal option as well as the reduced availability of disposal places imply the need to reduce the generation of radioactive wastes. That is only attainable if the correct management strategies are applied. This study was carried out in two phases, with Phase 1 consisting of an *in-situ* discussing of a specific Inquiry List that was previously sent to 14 medical establishments all over the country and visits to their radioactive waste producing facilities. In phase 2, samples from radioactive liquid wastes were collected from the installations above mentioned and measured for gamma spectrometry. The equipment used was a iodide sodium detector, 3"x 3" and associated electronic. dMCApro-Card and the software for gamma spectrometry winTMCA32, both from Target systemelectronic gmbh, were used for Spectra acquisition and analysis. Samples data and

Inquiry answers were thoroughly analysed in the conclusions of the Final Report, where different aspects of the management systems such as licensing, acquisition and storage of radiopharmacs, characteristics of the facilities, radioactive waste storage area, methods of collection and segregation of wastes, treatment techniques and interim disposal practices, waste packages, waste inventories, written procedures, waste transport, emergency plans, accessibility of the information related to the waste management strategies, applicability of the existing legislation and training, are object of analysis. Meanwhile, and still under the framework of this Contract-Project, is in preparation the document "Recommendations for a Code of Practice" for radioactive waste management activities. applicability of the existing legislation and training, are object of analysis. Meanwhile, and still under the framework of this Contract-Project, is in preparation the document "Recommendations for a Code of Practice" for radioactive waste management activities.



Published, accepted or in press work

1. R. Trindade, I. Paiva, L. Portugal, A Study of Radioactive Liquid Discharges from the Medical Facilities, Contract-Project No. 6/01, DGIES/ITN/DPRSN/SPROGeRR, Lisbon, 2003 (to be published by the Ministry for Health) (in press Report DPRSN A, nº)

Radioactive Liquid Discharges from Hospitals in Public Sewage of Lisbon Borough Council (CML)

R.Trindade, L.Portugal, I.Paiva

Objectives

A monitoring programme of radioactive liquid discharges from hospitals in the public sewage and Residual Water Treatment Plant (ETAR) of Lisbon was carried out in order to identify the radionuclides present and their activities. About 208 samples of liquid effluents were collected and analysed by quantitative and qualitative gamma spectrometry. This monitoring programme was requested by CML.

Results

The monitoring programme was divided in two different programmes, I and II. In Programme I was involved the sequential collection of 8 discrete samples in 4 sampling points: Portuguese Institute of Oncology Francisco Gentil (IPOFG); Atomedical (private nuclear medicine); Santa Maria Hospital (HSM) and Air Force Hospital (HFA), in a total of 192 samples. In Programme II, 4 discrete samples were taken at the ETAR's of Alcântara, Beirolas and Chelas in a total of 16 samples.

Samples were analysed for gamma spectrometry using a iodide sodium detector, 3" x 3" and associated electronic. Spectra acquisition and analyse was carried out using the dMCApro-Card and the software for gamma spectrometry winTMCA32, both from Target systemelectronic gmbh.

Among the 208 samples collected and analysed, only 7 samples showed values higher than the Daily Average Concentration for a specific radionuclide. It is envisaged to revise the sampling methods in order to improve the quality of the monitoring programme.

Published, accepted or in press work

- R. Trindade, L. Portugal, I. Paiva, Radioactive Liquid Discharges from Hospitals in Public Sewage of Lisbon Borough Council (CML), 2003 (in press, Report DPRSN A n°).

Services

1. Radioactive waste management

R.Trindade, I.Paiva, L.Portugal, F. Teixeira, L.Brás, N. Alves, H.Marquês

Following the work developed on this matter in the previous year, radioactive wastes from the national producers were collected, treated and conditioned in cement matrix or iron drums for interim storage. During this year about 126 requests for radioactive waste collection were received.

2. Radioactive liquid discharges from Oncology Portuguese Institute (IPO), Lisboa and Coimbra

R.Trindade, L.Portugal, I.Paiva, L.Brás, N. Alves, H.Marquês

A radiological survey of radioactive liquid waste from the Retention Tanks of IPO was carried out before being discharged into the public sewage. Samples of liquid effluents were analysed by quantitative and qualitative gamma spectrometry. This radiological survey was requested by IPO.

3. Radioactive liquids discharges from Nuclear and Technological Institute (ITN)

R.Trindade, L.Portugal, I.Paiva, L.Brás, N. Alves, H.Marquês, R.Pombo

A radiological survey is carried out of radioactive liquid effluents from RPI, Chemistry Sector and Central Tanks before being discharged to the Residual Water Treatment Plant. Samples of liquid effluents are analysed by quantitative and qualitative gamma spectrometry. The activities discharged are reported to the Radioactive Substances Committee of OSPAR Convention and art. 35° of Euratom Treaty.

4. Sealed sources licensing

R.Trindade, L.Portugal, I.Paiva, A. Rosa

According to Decree-Law n° 153/96 and Decree-Law n° 165/2002, requests related to import, export, utilization and transfer of sealed sources were analysed and licences of entrance in the national territory (95), transfer (39), transport (14) and possession (86) were issued. In the current year about 234 licenses were issued, meaning an increase of 23% over last year related number

5. Radioactivity in scrap metal

R.Trindade, L.Portugal, I.Paiva, L.Brás, N. Alves, H.Marquês

Radioactive material was detected and collected during a radiological survey, requested by the industry, of trucks containing scrap metal at a smelting factory. Eleven cases of radioactive materials in scrap metal were detected this year.

6. Radioactive cargo in transit

R.Trindade, L.Portugal, I.Paiva, D.Alves

A radiological monitoring and the verification of international rules compliance were carried out when ships transporting radioactive cargo called Portuguese harbours.

7. Nuclear vessels

R.Trindade, L.Portugal, I.Paiva, L.Brás, N. Alves, H.Marquês, F.Teixeira, M.Reis

An environmental radioactivity survey is carried out each time a nuclear vessel stayed at national harbours. The programme consisted on continuous monitoring of radioactive aerosols and airborne radioiodine, sampling of water, sediments and biological species for gamma spectrometry analysis. Sampling was done before, during and after the stay of the vessel. Results are reported to Ministry of Defence. In 2003, two nuclear French submarines, Rubis and Perle, stayed at Portinho da Costa harbour, in Lisbon.

8. Radiological control of a uranium shipment from ENU-SA, Urgeiriça

R.Trindade, I.Paiva, L.Portugal

A radiological control and the verification on compliance of international rules for transport of radioactive material were carried out when a uranium shipment was transported by road and sea.

9. The Gamma Radiation Facility, UTR

R.Trindade, I.Paiva, L.Portugal, L.Brás

A radiological protection programme was set up during the new source loading at ITN/CHIP irradiator with ⁶⁰Co sealed sources, total activity of 9.3x10¹⁵Bq. Involved in this operation was also Hungaroster Co. LTd, Budapest.

