

Radiological Protection and Safety Unit

Pedro Vaz

The following events, topics and activities must be highlighted for the year 2011:

Fukushima: The Fukushima catastrophe and its radiological consequences and the need to guarantee the necessary preparedness of response both at the national and international levels acquire paramount importance throughout the year. The need to provide technical and scientific advice to the Portuguese Government and to the Portuguese radiological emergency competent authorities and bodies, the detection in the Portuguese territory of the trace of the radioactive releases as well as the response to the pressure from the media, absorbed a significant part of the manpower and expertise of the UPSR for several months following the nuclear accident.

Accreditation: A major effort was devoted to the final steps of the preparation for the accreditation by the Portuguese Accreditation Institute (IPAC) of 10 radioanalytical, dosimetric and metrological techniques offered by the UPSR. The accreditation audits for 6 of the 10 techniques were successfully conducted in December and are a landmark in the deployment of the UPSR Quality Management System, which implementation started in September 2008.

ICP-MS: The effort towards the installation of the ICP-MS ("Inductive Coupling Plasma Mass Spectrometry") purchased at the end of 2009 was pursued and infrastructural works were undertaken. Again, the financial situation of ITN prevented the completion of the installation of the equipment during 2011. It is anticipated that the ICP-MS will become operational during 2012, allowing a simpler, faster and more complete assessment of radionuclides in environmental and biological samples.

Human Resources: The persistently increasing scarcity of human resources required to meet the increasingly higher volume of work resulting from the legal obligations and service providing duties as well as from the involvement in research and development projects, is presently seriously limiting and hampering the intervention capacity of the UPSR.

Dose DataMed II: Another landmark of 2011 was the successful engagement of ITN together with several other Portuguese institutions and stakeholders, in the assessment of the exposure of the Portuguese population to ionizing radiation in the framework of Radiodiagnostic and Nuclear Medicine procedures. This undertaking, a first of its kind in Portugal, was conducted in the framework of the European Union sponsored project Dose DataMed II.

Research and Development activities:

During 2011, research and development activities were conducted at a sustained rhythm with the involvement of

researchers, technicians, students and collaborators in national and international consortia conducting R&D activities and projects funded by the European Union (7th Framework Programmes) and by the Portuguese Foundation for Science and Technology (FCT), among others.

Collaborative links were fostered with hospitals and research centers in topics related to the medical applications of ionizing radiation.

Involvement in research activities under the umbrella of several Working Groups of EURADOS and EURAMET was continued.

Technical Services (selected topics):

The Environmental Radioactivity Group and the Measurement Laboratory conducted the National Environmental Radiological Survey. The Radioprotection and Radioactive Waste Group performed activities associated to the licensing of radioactive sealed sources, the interim storage of radioactive waste, the detection of radioactive substances in scrap metal, the management of radioactive wastes on medical, and industrial facilities, and the verification of the radiological safety of installations. The Dosimetry and Radiobiology Group pursued its technical activities related to the assessment of the safety of Nuclear Medicine installations and Radiotherapy vaults throughout the country, as well as to individual and environmental monitoring. The Laboratory of Metrology of Ionising Radiation performed the calibration and metrological verification of equipments.

Participation in intercomparison exercises:

The UPSR staff involved in environmental radioactivity measurements and in radioanalytical techniques and methods participated in intercomparison exercises organized by the International Atomic Energy Agency (IAEA), by the European Commission (EC) and other foreign institutions and organizations.

Education and Training:

UPSR researchers participated in training courses in Radiological Protection for professionals in the medical and industrial sectors and taught several disciplines in post-graduation and Masters Courses in Radiological Protection and Safety, in several Portuguese universities. A significant number of Master thesis and post-graduation works, supervised by UPSR researchers, was observed.

Participation in national and international technical and scientific committees:

UPSR researchers acted as Portuguese representatives in international Committees, Working Groups and Task Forces whose activities are organized under the auspices of the EU, the IAEA and the OECD/NEA

Staff

Researchers

P. VAZ, Princ.(Agreg.)
C. OLIVEIRA, Princ.(Habil.)
F.P. CARVALHO, Princ.
M.A. NEVES, Princ. (until July)
M.J. MADRUGA, Princ.
A. D. OLIVEIRA, Aux.
I. PAIVA, Aux.
J. ALVES, Aux.
J. CORISCO, Aux.
M. REIS, Aux.
O. MONTEIRO GIL, Aux.

P. TELES, Aux.
R. TRINDADE, Aux (until July)
S. di MARIA, Post-doc

Admin & Techn.

Personnel
A. CASTRO
A. MOURATO
D. ALVES
G. L. SILVA
I. LOPES
J. ABRANTES

J. CARDOSO
J. OLIVEIRA
J. VENÂNCIO
L. MACHADO
L. PORTUGAL
L. SANTOS
L. SILVA
M. A. LIBÂNIO
M. E. PACHECO
M. MALTA
M. SANTOS
M. SARAIVA
P. PEREIRA (since Dec)

S. RANGEL
T. ANTUNES
Y. ROMANETS

Students

A. BAPTISTA
A. BELCHIOR
A.C. ANTUNES
A.R. GOMES
C. BORGES
C. CARRAPIÇO
C.FIGUEIRA
E. ANDRADE

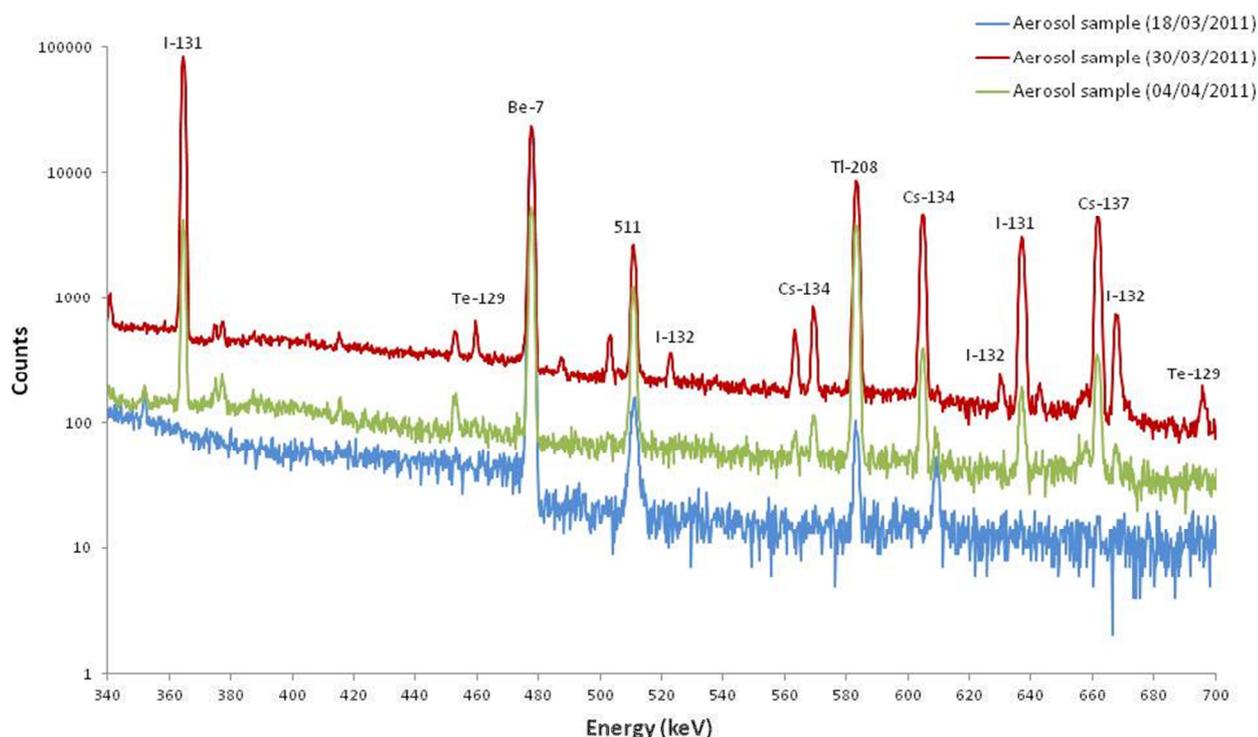
G. CARVALHAL
J. BENTO
J. MELO
M.F. PEREIRA
MARGARIDA CALDEIRA,
R. SARMENTO
R.F. LUÍS
S. BARROS
V. MARTINS

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Detection at ITN of Cesium, Iodine and Tellurium isotopes released from Fukushima Dai-ichi

P. Vaz, R. Trindade

At the end of March, the aerosols sampling station ASS500 in the campus of ITN started to detect trace amounts (below 1 mBq m^{-3}) of Cesium, Iodine and Tellurium radionuclides due to the Fukushima Dai-ichi nuclear power plant accidents and associated atmospheric releases of radioactivity on the days following March 11. The plume travelled through the Pacific Ocean, North America and the Atlantic Ocean before being detected in several European countries. The filters of the ASS500 station were measured by gamma spectrometry using HPGe detectors. The characteristic signatures of the ^{137}Cs , ^{134}Cs , ^{131}I , and other radionuclides are well visible in the spectrum.



The very small levels of radioactivity detected did not pose any hazards to the public health.

Accreditation - Implementation of the Quality Management System at the UPSR

I. Lopes¹

The first stage of accreditation audits took place in December 2011 for the 6 following techniques:

- Determination of the activity of gamma emitters in solid and liquid matrices using high resolution gamma-ray spectrometry;
- Gross alpha/beta in waters using proportional counters or Liquid Scintillation Counting (LSC);
- Tritium determination in waters by LSC.

The second stage of accreditation audits will take place in January of 2012, for the following 4 techniques:

- Metrological control of the linearity of response for $Hp(10)$ of individual monitors;
- Metrological control of the linearity of response for $H^*(10)$ of portable area monitors;
- Assessment of $Hp(10)$ using whole body dosimeters by termoluminescence;
- Assessment of $Hp(0.07)$ using whole body dosimeters by termoluminescence.

These audits result from the dedicated efforts, since September 2008, of researchers, technicians and collaborators in quality activities with the involvement and support of the top level management.

The Quality Manual, management and technical procedures were reviewed and improved during this year. The competence of the staff was taken into account on the basis of appropriate education and training. Internal audits were also carried out by UPSR auditors in November 2011, to verify if the activities are conducted according to the ISO/IEC 17025:2005 international standard requirements.

The implementation of the QA system based on this international standard allows the UPSR laboratories to improve the methods, to identify problems, to implement preventive and corrective actions, to generate valid results and to achieve a stable level of high quality output.

¹Quality Manager at the UPSR – on behalf of the UPSR's Working Group on the Accreditation