

EURADOS Working Group 3

Environmental radiation monitoring

Motivation

In March 2011, the nuclear power plant accidents in Fukushima Daiichi demonstrated the indispensable need for permanent and reliable environmental radiation monitoring.

In Europe, at present, more than 4000 stations make radiological monitoring data available in nearly real-time. In case of a nuclear emergency, national dose rate data have to be provided to the European Commission (EC) on an hourly basis, via the European Radiological Data Exchange Platform (EURDEP). Based on these and other radiologically relevant data, the EC, which is in charge of the European Community Urgent Radiological Information Exchange System (ECURIE) may issue recommendations to the EU member states which could affect millions of people and may have severe economic and sociological consequences.

The harmonisation of ambient dose rate measurements in Europe is a prerequisite for the reliability of the ECURIE system and an important contribution to its quality assurance. Therefore, the EURADOS working group on environmental radiation monitoring (WG3) addressed the task of harmonising environmental dose rate measurements and invited the operators of national early warning dosimetry networks in Europe to participate in intercomparison programmes in 1999, 2002, 2006 2008, 2009 and 2012. These measurements have also helped to ensure that the prerequisites needed to join the EURATOM treaty, as far as environmental radiation monitoring is concerned, are sufficiently fulfilled by the new member states of the European Union.

In addition, the development of new detector systems based e.g. on LaBr_3 , CZT and CeBr_3 detectors, which are able to provide ambient dose rate values as well as nuclide specific data on contamination levels in real time, requires metrological support. EURDEP, IAEA, EURADOS, meetings of network operators on the European scale have shown interest in the introduction of spectrometric detectors systems. Therefore, there is a need for the harmonization and standardization of spectrometric units on European scale. Since 2012, a subgroup of WG3 (WG3-SG1) has been working on the fulfilment of these requirements.

Complementary to the use of active dosimetry or spectrometry systems, passive area dosimetry systems (e.g. TLD and OSL) are widely used for the monitoring of nuclear, industrial, medical and research installations in Europe. Since 2014, a subgroup of WG3 (WG3-SG2) is addressing this topic and will organise intercomparisons of passive dosimeters used in area and environmental radiation monitoring. Harmonization within Europe in this topic is one of the major goals due to different national traditions and experiences. Recommendations regarding basic terminology, measurement procedures and measurement uncertainties as well as performance criteria for intercomparisons are important issues in this field.

Aims

The aim of WG3 is to provide information about the correct measurement of ambient dose and dose rate and radioactivity concentrations for different scenarios such as routine emissions from nuclear installations, nuclear emergencies with local impact and nuclear disaster with transboundary implications. WG3 will contribute by:

- Metrological support of the harmonisation process of early warning dosimetry network systems in Europe
- Stimulation of cooperation; especially between the Institute for Environment and Sustainability (IES) with regard to EURDEP (European Radiological Data Exchange Platform) and EURADOS WG3 in the field of environmental radiation monitoring
- Organisation of intercomparison programmes
- Development of methods for environmental dosimetry
- Investigation of the use of gamma spectrometry systems for environmental radiation monitoring
- Definition of standards; e.g. the publication of technical recommendations

Actions

Completed

- Intercomparison of dosimetry systems operated at early warning dosimetry networks in 2008, 2009 and 2012
- Organisation of joint workshops of IES - AIRDOS and EURADOS WG3 held in Stresa, Italy, in May 2010 and in Ispra, Italy, in October 2011
- Implementation of a WG3 subgroup (WG3-S1) in 2011 dealing with spectrometry systems used for dosimetric applications in environmental radiation monitoring
- Joint international workshop on gamma dose rate and ground contamination measurements in Freiburg (Germany), May 2013, organised by BfS, FMF-Freiburg and EURADOS in cooperation with IAEA and EC
- Intercomparison (2013/2014) of passive dosimetry systems operated in environmental radiation monitoring
- Implementation of a WG3 subgroup dealing with passive dosimetry systems used for environmental radiation monitoring
- Participation of WG3 in an intercomparison exercise of "MetroERM" (for MetroERM see "News") in 2015 for spectrometry systems used in Environmental Radiation Monitoring
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Planned

- Definition of minimal requirements for European early warning dosimetry network systems
- Development of alternative methods in environmental dosimetry
- Participation of WG3 in an intercomparison exercise of "MetroERM" in 2016 for early warning dosimetry network systems
- Organisation of a further intercomparison exercise of passive dosimetry systems used in Environmental Radiation Monitoring, to be held in 2016 or 2017

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News

- > In the framework of the European Metrology Research Programme (EMRP) a joint research project (JRP) titled “Metrology for radiological early warning networks in Europe” (MetroERM) started in June 2014. This project, financially supported by the EC and EURAMET, will last for 3 years and is strongly supported by EURADOS members from sixteen European institutions.
- > The first international intercomparison exercise of passive dosimetry systems used for environmental radiation monitoring was organised by the Subgroup WG3-S2 “passive dosimetry”. The intercomparison, with about 40 participants, has been performed at the PTB reference sites for environmental dosimetry and took place from May to October 2014.
- > From 15th to 19th June 2015 the intercomparison for spectrometry systems used in Environmental Radiation Monitoring has been performed in the framework of MetroERM. The intercomaparison was carried out at the PTB with the participation of PTB, BfS, CIEMAT, UPC and EHU, using diferent spectrometric detectors: LaBr₃, CZT, CeBr₃ and Srl₂.
- > IAEA- Technical Meeting on the Development of Nuclear Instrumentation for In Situ Environmental Monitoring Programmes. IAEA Headquarters Vienna, Austria 30 November–4 December 2015

Additional information

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