

EURADOS Working Group 3

Environmental radiation monitoring

Motivation

The protection of the public against ionising radiation and radioactive contaminations caused by nuclear or other radiologically accidents may affect thousands of people. Following a radiological event, radiation protection authorities and other decision makers need quick and credible information on affected and contaminated areas. 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 5000 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. In addition, the development of new detector systems based e.g. on LaBr₃, CZT and CeBr₃ detectors, which are able to provide ambient dose rate values as well as nuclide specific data on contamination levels in real time, are being installed in radiological networks and requires metrological support. Therefore, there is a need for the harmonization and standardization of spectrometric units on European scale. A subgroup of WG3 (WG3-SG1) has been working on the fulfilment of these requirements. This subgroup also deals with the use of UAVs equipped with appropriate detector systems for the measurement of ionising radiation with the aim to optimise measuring procedures.

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 workplace and environmental radiation monitoring. Harmonization within Europe in this topic is one of the major goals due to different national traditions and experiences.

The COUNCIL DIRECTIVE 2013/59/EURATOM brings significant changes, with respect to the former Directive 96/29/Euratom, in terms of protection measures related to exposures due to the inhalation of radon progeny not only in work environments but also in dwellings. The member states had 4 years (deadline 2018) to implement these regulations in their legislation. In 2018 the subgroup WG3-SG3 is created with the main objectives to harmonize activities in the field of radon activity concentration measurements and related dose assessments and to provide support in the usage of the radon/-progeny dose conversion factors published by ICRP in dose assessment at homes and at workplaces.

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, and also regarding natural radioactivity scenarios such as radon dosimetry based on activity concentration measurements. 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 and support the usage 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

- Implementation of a new WG3 subgroup (WG3-SG3) in 2018 dealing with radon dosimetry and monitoring
- 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 intercomparison was carried out at the PTB with the participation of PTB, BfS, CIEMAT, UPC and EHU, using different spectrometric detectors: LaBr₃, CZT, CeBr₃ and SrI₂.
- 1st EURADOS Intercomparison of passive $H^*(10)$ area photon dosimeters "IC2014env" for Environmental Monitoring
- EURADOS members have been invited by EMPIR Preparedness to participate in 6-months intercomparison of passive $H^*(10)$ area photon dosimeters in 2017/2018
- EURADOS intercomparison of calibration methods for passive area dosimeters "IC2016calm" and "IC2018calm" with KIT spherical $H^*(10)$ dosimeters.
- Letter of agreement with MetroRadon Project.
- EURADOS members have been invited by MetroRadon to participate in an intercomparison on indoor radon organized by Laboratory of Radioactivity, University of Cantabria

Planned

- Definition of minimal requirements for European early warning dosimetry network systems
- Characterization of current and alternative methods in environmental dosimetry.
- Analysis of the EURADOS intercomparison of calibration methods for passive area dosimeters "IC2018calm"
- Analysis and preparation of a final report of the survey of European passive area dosimetry systems by questionnaires 2013-2017

- In the framework of “preparedness” project, application of UAV-based systems including calibration procedures and intercomparison exercises.
- Participation on the organization of an international meeting (2020) regarding spectrometric systems in the environmental field
- Collaboration in “Preparedness”, “CONFIDENCE” and “MetroRadon” European projects
- Co-Working together with MetroRadon and establishing relations to the ICRM (dealing with radon activity (Bq and Bq/m³) for realisation of the unit) and thus provide guidance for measurement of activity concentration in field and conversion of the results to dose according to ICRP 137
- Submitting of two Potential Research Topics for the EMPIR Environment Call 2019
- Submitting of a Potential Network Topic for the EMPIR Network Call 2019 which includes aspects of environmental monitoring and radon to underpin the COUNCIL DIRECTIVE 2013/59/EURATOM.

Members

Chairperson

- Arturo Vargas Universitat Politècnica de Catalunya (UPC), Spain
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Full members

- Working Group 3 has currently 30 full members from 15 countries

Corresponding members

- Working Group 3 has currently 70 corresponding members

News

- In the framework of the European Metrology Programme for Innovation and Research (EMPIR) a joint research project (JRP) titled “Metrology for mobile detection of ionising radiation following a nuclear or radiological incident” (Preparedness) started in August 2017. This project, financially supported by the EC and EURAMET, will last for 3 years and is strongly supported by EURADOS members.
- In the framework of European Joint Programme – CONCERT a project titled “Coping with uncertainties For Improved modelling and DEcision making in Nuclear emergenCiEs “ (CONFIDENCE) started in 2016. Different members of EURADOS participate in the project.
- In the framework of “Preparedness” an international meeting on spectrometric systems is being organized for 2020.

Additional information

See EURADOS web site (www.euroados.org).