



1st June 2014– 31th May 2017

JRP EMRP ENV09: MetroERM

Metrology for radiological early warning networks in Europe

Exploitation plan D4.3.1

Exploitation plan

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Introduction

The Exploitation plan should help that the results of the JRP are exploited to the benefit of early warning networks operators, manufacturers and other researchers, technicians and end-users. The plan will be reviewed and updated 6 monthly at each JRP meeting under CMI's leadership, with participation of all JRP-Partners, REG(AUTH) and REG UPC.

1. Project description

This JRP aims to deliver metrologically sound measurement of fundamental radiological quantities such as ambient dose equivalent rate, radioactivity concentrations in air and ground contamination levels in real-time. This requires novel multidisciplinary approaches to be taken by a European collaboration of metrology and research institutes, including the JRC at Ispra which is responsible for the EURDEP database, accompanied by stakeholders and manufacturers of radiological monitoring detector systems. This JRP will provide the unique possibility to comprehensively address the harmonisation of the radiological early warning networks in Europe - the largest and most comprehensive environmental radiation monitoring system worldwide.

The JRP is subdivided into three scientific/technical work packages:

- Development of novel and improved instrumentation for spectrographic dose rate and dose rate measurements for field station use, validated by benchmark experiments, long-term measurements and Monte Carlo simulations.
- Improvement of existing and development of new instrumentation for the determination of airborne radioactivity concentration and develop improved techniques for the validation of gamma-spectrometry data.
- Ensuring of traceability of dose rate and airborne radioactivity measurements ensuring, by the quantification of improved metrological procedures and an adequate quality management system, which will explicitly support the process of harmonisation of radiological data from early warning networks in Europe by systematic investigations, comparison exercises and the publication of recommendations.

2. Exploitable results

Following exploitable research results are expected:

- Novel and improved dose rate measuring instruments for field-station use, based on CdZnTe and LaBr₃ detectors. (Task 1.2 – device, procedure)
- Dose rate and contamination level calculation. (Task 1.3 - procedure)
- Background level estimation and correction methods. (Task 1.5 – procedure)
- Novel and improved airborne radioactivity measuring instruments for field-station use, based on HPGe detectors. (Task 2.2 – device, procedure)
- Reference materials and procedures for calibration and testing of airborne radioactivity measuring instruments. (Task 2.3 – reference material, protocol)
- Background level estimation and correction methods for gamma-spectrometry. (Task 2.4 – procedure)
- Radiochemistry techniques for the airborne activity of alpha and beta emitting radionuclides determination. (Task 2.5 – method)

- Examination of dosimetry network systems, in particular those installed in new EU Member States, in an intercomparison. (Task 3.1 – intercomparison)
- Organization of an intercomparison with custom made spiked filters. All European network operators will be invited to participate. (Task 3.2 – intercomparison)
- Recommendations for the harmonisation of early warning network systems, which allow European network operators to achieve better comparability of the measured data using existing monitoring systems as well as new, improved monitoring systems. (Task 3.4 – good practice guide)
- Offer of new calibration services for airborne radioactivity monitors developed in the project. (Task 4.3 – service)
- Establishment of new low dose calibration services for early warning network monitors. (T4.3 - service)

3. Dissemination and exploitation activities

3.1 Stakeholder Committee (SC)

The first SC meeting was held on the 30th and September and 1st October 2014 in Bilbao (Spain). The second SC meeting was held on the 13th of March 2015 in Varese (Italy). Stakeholder Committee has 29 members from 23 institutions. The next SC meeting will be held together with the second workshop in spring 2017 in Trebic (CZ).

3.2 JRP meetings

The JRP kick-off meeting was held on the 23rd and 24th of July 2014 at PTB in Braunschweig. All presentations and meeting minutes are available at the JRP webpage with restricted access.

The first PMB a GP meeting was held on the 11th and 12th of March 2015 in Varese (Italy). All presentations and meeting minutes are available at the JRP webpage with restricted access.

The second PMB a GP meeting was held on the 12th and 13th of November 2015 in Rome (Italy). All presentations and meeting minutes are available at the JRP webpage with restricted access.

The third PMB a GP meeting was held on the 26th and 27th of May 2016 in Barcelona (Spain). All presentations and meeting minutes are available at the JRP webpage with restricted access.

The fourth PMB and GP meeting will be held on the 29th and 30th of November in Madrid (Spain). All presentations and meeting minutes will be available at the JRP webpage with restricted access.

3.3 Stakeholder workshops

At least two workshops for stakeholders and end-users will be organized and held.

The first workshop was held on the 13th of March 2015 in Varese (Italy) within the EURDEP 20 years workshop.

The second workshop is proposed for March, April or May 2017 to present final project research results to stakeholders and end-users. The workshop should be held in spring 2017 in Trebic (CZ).

3.3.1. Presentations

All presentations from the workshops are available at <http://earlywarning-emrp.eu/Impact/Knowledge Transfer/Workshops/Varese>.

3.3.2. Demonstrations

Demonstration of the device for airborne radioactivity measurement developed by Nuvia (former Envinet) and CMI was performed in December 2015 in Trebic (CZ) to a group of stakeholders from European institutions and companies. The complete experimental device will be presented at the second workshop.

3.4 JRP webpage

3.4.1. Webpage with restricted access

The JRP webpage with restricted access has been established on the NPL's SharePoint site: <https://shared.npl.co.uk/landing>.

The webpage contains all meetings and workshops presentations.

3.4.2. Webpage with open access

The JRP webpage with open access has been created:

<http://www.earlywarning-emrp.eu>.

The webpage contains project and project participants description, registration form for stakeholders and events information.

Also, the webpage contains workshops presentations, links to conference presentations and publications abstracts, trainings and exploitation information.

3.5 Good Practice Guides

At least two good practice guides will be written:

- *Dose rate measurement at environmental radioactivity levels*
- *Airborne radioactivity monitoring at environmental levels*

The good practice guides will be prepared at the end of the project in March 2017 and disseminated to stakeholders and end-users.

3.6 Publications

3.6.1. Book publications

3.6.2. Journal publications

At least 18 papers will be submitted to peer-reviewed journals and at least 4 papers will be submitted to trade and popular journals.

Published papers:



1) Stefaan Pomme et al.: Unbiased equation for Zr-95 – Nb-95 chronometry, Applied Radiation and Isotopes 90(2014)234-240.

2) Alexandros Clouvas et al.: Periodicity analysis of gamma radiation measurements in Thessaloniki, Radiation Protection Dosimetry (2015), pp. 1-9.

3) Jaroslav Solc et al.: Validation of Monte Carlo model of HPGe detector for field-station measurement of airborne radioactivity, Journal of Instrumentation, JINST_11_P03015.

4) Alexandros Clouvas et al.: Radon migration in soil and its relation to terrestrial gamma radiation, Radiation Protection Dosimetry (2016), pp. 1-10.

Four other papers have been submitted to Health Physics, Journal of Instrumentation, Applied Radiation and Isotopes and Journal of Environmental Radioactivity.

Abstracts are available on the project webpages.

3.6.3. Public media

3.6.4. World Wide Web

3.6.5. Conference publications

At least 10 contributions will be presented at target international conferences.

20 papers have been presented at scientific conferences by project partners.

These conferences with total auditorium of about 1000 persons have been held in Spain, Croatia, Italy, Germany, Greece, Ireland and Austria.

Links to the conferences webpages are available on the project webpage.

3.6.6. Other publications

3.7 Standard committees

JRP-Partners are members of ISO, IEC and EURAMET committees and ICRM working groups.

PTB contributed to a draft documentary standard of IEC SC45B committee.

PTB presented the JRP activities and research results at the EURAMET TC-IR 2014 meeting.

ENEA presented the JRP activities and research results at IEC SC45B committee meeting.

3.8 Training

3.8.1. E-Training courses

E-training course will be designed and delivered with the aid of experienced NPL's Training Team.

3.8.2. Training courses

The Monte Carlo training course was organized by REG(UPC) on the 24th and 25th of May at Institute of Energy Technologies in Barcelona with participation of 9 attendees. The documents are available at the public project webpage.



3.9 Foreground

3.9.1. Patents

3.9.2. Registered designs

3.9.3. Utility models

3.10 Engagement with other European projects and initiatives

4. References

- [1] Neumaier S. et al.: EMRP 2013 JRP ENV57 Protocol.
- [2] Reference2.
- [3] Reference3.