

## **Title: Support for a European Metrology Network on reliable radiation protection regulation**

### **Abstract**

Currently, radiation protection regulation is defined by the Council Directive 2013/59/EURATOM. The EURATOM Directive sets out basic safety standards for protection against exposure to ionising radiation, for European citizens, workers and the environment. Key measurements in the EURATOM Directive include legal dose assessments, exposure limits and activity concentrations. However, ionising radiation is consistently being improved and developed with new technologies such as pulsed fields, therefore regulation and its associated measurements need to be reliably updated. There are a number of existing networks across Europe that provide support for aspects of radiation protection, however none of these can currently cover the full scope of radiation protection needs. To address this, a sustainable, joint effort from EU member states is needed in order to set up and maintain reliable quality assurance for radiation protection regulation. The European Network should ensure access to reliable radiation protection metrology, coordinate the provision of services and support the development of new reference fields in order to underpin legal requirements.

### **Keywords**

Radiation protection, EURATOM, dose rates, activity concentration, health protection, environmental monitoring

### **Background**

The implementation of the EURATOM Directive provides national radiation protection regulation in all EU member states. The Directive provides safety regulation for workers, the public and the environment. For example, article 39 of the EURATOM TREATY covers surveillance of the workplace via the measurement of external dose rates, including activity concentrations in air and surface contamination. Whilst this regulation is important for radiation protection, it is often challenging to implement and, in some cases, drastically reduces exposure limits (e.g. the dose limit for radon activity in workplaces). This means that accurate and reliable radiation protection measurements are more important than ever.

Furthermore, new technological developments, such as the medical use of pulsed dose rates, have determined an increasing complexity of the radiation protection field. As a consequence, the metrology for radiation and legal dose assessments has also become a highly complex task and new test methods are needed. Across Europe several NMIs and DIs have established new capabilities, but no single institute can currently provide stakeholders with access to all their radiation protection needs.

In terms of 'classical' non-pulsed x-ray fields the International Atomic Energy Agency (IAEA), jointly with the World Health Organisation (WHO), currently provides support for radiation protection dosimetry through their network of Secondary Standards Dosimetry Laboratories (SSDLs), known as the IAEA/WHO SSDL network. Within this network, SSDLs designated by an IAEA member state, provide calibrations for dosimetry equipment and traceability for national dosimetry standards to the SI. However, the IAEA/WHO SSDL network does not currently cover new developments in technology such as complex and/or pulsed radiation.

Another radiation protection network that currently exists is the European Radiation Dosimetry Group (EURADOS). EURADOS currently brings together approximately 560 radiation protection experts/scientists from 70 European institutions, however EURADOS is not a metrological organisation and does not have its own facilities. Therefore, although it can provide advice on radiation protection and its regulation it cannot support its implementation.

How and where NMIs should focus limited resources to obtain maximum impact for society urgently requires a strategic plan and significant coordination both at European and global levels. No single NMI has the expertise or resource to tackle all or even a significant fraction of the most critical priorities without

collaboration. Without coordination, there is a strong likelihood of unnecessary duplication, with NMIs (nationally and/or regionally) potentially independently choosing to focus efforts on the same challenge consequentially neglecting others. EURAMET is considering establishing a European Metrology Network to coordinate the European NMI response, to establish close links to the stakeholder community, to develop and implement a strategic agenda and establish a knowledge, technology transfer and promotion plan, to ensure an effective response will be put in place. This SNT is intended to elaborate how a network could support EURAMET and to support that network in its initial tasks.

## Objectives

Proposers should address the objectives stated below, which are mainly based on the PNT submissions. Proposers may identify amendments to the objectives or choose to address a subset of them in order to maximise the overall impact, or address budgetary or scientific / technical / legal / regulatory / market constraints, but the reasons for this should be clearly stated in the protocol.

The JNP shall focus on developing a long term ongoing dialogue between the metrology community and relevant stakeholders. This dialogue should support the take-up of research outputs from the metrology community and the collection of needs from stakeholders to inform future research.

The specific objectives are to:

1. To establish regular, constructive dialogue and liaison between the project and stakeholders of radiation protection regulation. This should include (i) standards development and regulatory organisations related to Council Directive 2013/59/EURATOM, (ii) national and international bodies e.g. Heads of the European Radiological Protection Competent Authorities (HERCA), IAEA, EURADOS, (iii) manufacturers of radiation protection devices and (iv) medical staff.
2. Using the feedback from stakeholders in Objective 1, to develop a web-based platform for radiation protection regulation stakeholders. The platform should include easy access to European metrology capabilities and regulatory requirements i.e. for the Council Directive 2013/59/EURATOM, as well as a service desk to answer stakeholder's questions. The platform should also be developed in a manner that allows it to be maintained by a future EMN.
3. Using the feedback from key stakeholders in Objective 1, to develop a Strategic Research Agenda (SRA) and roadmaps for metrology services underpinning radiation protection regulation. The SRA and roadmaps should take into account existing national priority lists and on-going initiatives and networks such as the SSDL network, EURADOS and EURAMET TC-IR. The SRA shall address the measurement of ionizing radiation in the workplace and environment as required by the EURATOM TREATY articles 31, 33, 35 and 36.
4. Using the feedback from stakeholders in Objective 1, to set up and promote a knowledge-sharing programme for stakeholders, in order to support the dissemination and uptake of results, including those from previous, relevant EU research. This should include a range of regularly hosted activities for a wide range of stakeholders such as the exchange of scientific personnel between organisations, metrology workshops, training courses and interlaboratory comparisons.
5. To develop a plan for a joint and sustainable European metrology infrastructure underpinning radiation protection regulation. The plan should be completed within 12 months of the start of the project and address how to (i) develop coordination and smart specialisation of capabilities, (ii) integrate existing Quality Assurance infrastructure and type testing laboratories into the joint infrastructure, (iii) align with other running initiatives and with TC-IR, (iv) promote the development of emerging member states, and (v) consider an extension of the collaboration to third countries.

The proposed activities shall be justified by clear reference to the measurement needs within strategic documents published by the relevant stakeholders. Proposers should establish the current state of the coordination in this area, and explain how their proposed project goes beyond this.

The proposed activities should not include those essential for the establishment and operation of the EMN. EMNs will be established and operated by the EURAMET members using their own national resources regardless of whether specific EMPIR proposals are funded. EMPIR funding is for specific tasks aimed at ensuring a proposed EMN will progress quickly towards its establishment and implementation and contribution to the objectives of the programme.

EURAMET expects the average EU Contribution for the selected JNPs in this TP to be 0.4 M€, and has defined an upper limit of 0.5 M€ for this project.

## **Potential Impact**

Proposals must demonstrate adequate and appropriate participation/links to the “end user” community, describing how the project partners and collaborators will engage with relevant communities during the project to facilitate knowledge transfer and accelerate the sustainability of the organisation. Evidence of support from the “end user” community (e.g. letters of support) is also encouraged.

You should detail how your JNP results are going to:

- Address the SNT objectives and deliver solutions to the documented needs,
- Provide a lasting improvement to coordination in the European metrological community and communication with their stakeholders beyond the lifetime of the project,

You should detail other impacts of your proposed JNP.

You should also detail how your approach to realising the objectives will further the aim of EMPIR to develop a coherent approach at the European level in the field of metrology and include the best available contributions from across the metrology community. Specifically, the opportunities for:

- improvement of the efficiency of use of available resources to better meet metrological needs and to assure the traceability of national standards
- the metrology capacity of EURAMET Member States whose metrology programmes are at an early stage of development to be increased

## **Time-scale**

The project should be of up to 4 years duration.