

Announcement of the EURADOS Intercomparison 2022 For Neutron Dosimeters (IC2022n)

EURADOS was created to be a scientific network of European laboratories involved in research in radiation dosimetry. The objective is to advance the scientific understanding and the technical development of the dosimetry of ionising radiation by stimulating collaboration between European facilities.

Over the last decade EURADOS has coordinated a Working Group on harmonisation of individual monitoring in Europe (WG2) entrusting its members with a variety of tasks. With the aim of improving the harmonisation of individual monitoring and helping individual monitoring services (IMSs) to comply with ISO/IEC standard 17025, the Subgroup 2 (WG2-SG2) was assigned the task of setting up a self-sustained programme of personal dosimeter intercomparisons in Europe.

As a result of this work, EURADOS has successfully executed several types of intercomparisons dosimeters for individual monitoring dosimeters:

- since 2008 and on a 2 years basis for whole-body photon dosimeter,
- in 2009, 2015 and 2019 for extremity dosimeters,
- and in 2012 and 2017 for neutron dosimeters.

To respect the 5-year basis for neutron intercomparison exercise, EURADOS now has the pleasure to announce the **2022 EURADOS Intercomparison for neutron dosimeters**.

Scope

This inter-comparison concerns the performance of neutron dosimeters intended to measure neutron personal dose equivalent $H_p(10)$ provided by individual monitoring services. The neutron dosimeters may be passive or active, but must be used *routinely* in individual monitoring of exposed workers. No systems under development will be allowed in the inter-comparison. In case of active dosimeters, participants can be manufacturers, however, dosimeters will be used in the same way as passive dosimeters, i.e. they will be returned to the participant for reading and no processing or handling of the dosimeters will be undertaken by the irradiating laboratories.

The irradiations, which will include exposures to neutrons and mixed fields of neutrons and photons, will be performed in accredited irradiation facilities in terms of $H_p(10)$. The range of energies used in the inter-comparison will extend from thermal to several MeV, with different dose values and angles used. Most irradiations will be performed in neutron fields with no additional photon component, over and above that resulting from the neutron-producing process, e.g. the photons from a radionuclide neutron source. However, for some fields, an additional photon component could be included.

Participants are requested to only apply routine procedures as declared in the application form, where they can also declare whether they need additional simplified *a priori* information on the energy distribution of the irradiation fields to allow correction of the bare results of neutron personal dosimeters.

Intercomparison procedure

IMs wishing to participate are asked to register using the Online Platform before the fixed deadline of 15th, February 2022: <https://www.eurados-intercomparison.org/ic2022n/>

The Organization Group will register each application and informs each participating IMS when their application has been accepted.

If an IMS wishes to participate with more than one type of dosimeter, this IMS will have to log in to the Online Platform and will be able to add one or more systems as wishes.

The intercomparison will only take place if the number of participants makes the exercise sustainable provided the EURADOS council's agreement.

On acceptance of the application, the participant will receive an invoice from EURADOS and instructions on dosimeter labelling and despatch.

The participation fee is 3300 Euro per dosimetry system. EURADOS sponsors will pay a reduced fee of 3000 Euro for one system and 3300 Euro for any additional system.

Fees must be transferred in advance to the EURADOS bank account (free of bank transfer costs) after receiving the invoice from EURADOS. Refunding will only be possible in the unlikely event that the intercomparison is cancelled by EURADOS.

The fee was calculated on a non-profit basis and any surplus will be used primarily for the purpose of harmonisation in individual monitoring and maintaining the expertise in this field within EURADOS.

For this intercomparison, each participating IMS shall provide a total of 44 dosimeters to the coordinator of the Organization Group:

- 28 dosimeters for irradiation,
- 8 spare dosimeters,
- 8 background/transit control dosimeters.

Up to 4 dosimeters may be used to test for false positive response. This specific test would be performed as a matter of scientific point of view. These dosimeters would not be considered for the evaluation of dosimeter performance according to ISO 14146 standard.

After irradiations have been conducted, the coordinator of the Organization Group will return the dosimeters to the participant for readout. Within one month after receiving the dosimeters, the participant must submit the results in terms of $H_p(10)$ in an online response form provided by the Organization Group.

After the deadline to submit results, the Organization Group will send the participant the irradiation data (reference doses, uncertainties and irradiation qualities) and response values. Change to the results after distribution of the irradiation data will only be possible if errors are made by the irradiation lab or Organization Group.

After confirmation of the results, EURADOS will provide the participant with a "Certificate of Participation" including information on the irradiation qualities, doses imparted, response values and overall uncertainties for all irradiations.

Intercomparison report

The Organization Group will prepare a report summarizing the results of the intercomparison. The report will mention the names of the IMSs that participated and the type of dosimeter used, but the results will be given anonymously.

The results of the intercomparison will be presented at the Participants' Meeting that will be organized to show and discuss the results among the Organization Group and the participants. It is planned to organize this meeting as a satellite event of the EURADOS Annual Meeting 2023. The exact date and place of this meeting will be announced in due course. The final report publication is expected to be approximately one year after the Participants' Meeting.

Intercomparison results will be considered by EURADOS as confidential data and will only be used for statistical purposes for technical and scientific studies. The Organization Group have signed a confidentiality agreement and both the identity of the participants and the reference data will be known only to a minimum number of persons within the Organization Group.

Provisional Time Schedule

First Announcement	15 November 2021
Registration of participation	15 November 2021
Deadline for registration	15 February 2022
Confirmation and provision of guidelines to participating IMS	1 April 2022
Deadline for provision of dosimeters by IMS	1 May 2022
Irradiations	May to August 2022
Return of dosimeters for readout and evaluation	15 September 2022
Deadline for reporting results	15 October 2022
Confirmation of IMS results by Organization Group	15 November 2022
Participants' Meeting and issue of Certificates	Annual Meeting 2023

EURADOS Neutron Intercomparison 2022 Organization Group

Marie-Anne Chevallier	IRSN, France (Coordinator)
Elena Fantuzzi	ENEA, Italy
Michael Hajek	IAEA, Austria
Sabine Mayer	PSI, Switzerland
Désirée Radeck	PTB, Germany

Contact: ic2022n@eurados-intercomparison.org