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25 YEARS OF EURADOS WORKING GROUP 2 "HARMONISATION OF INDIVIDUAL MONITORING IN EUROPE"

April 2022: The International Conference on Individual Monitoring of Ionising Radiation (IM2022), the first live conference after the COVID pandemic, provided a renewed opportunity to discuss again with colleagues and share new information about individual monitoring, how we solve our common problems by research studies, new methodologies...

This desire, this need to share common problems around this theme does not date from yesterday. It was born 25 years ago in Brussels at 28th of April 1997, during the first plenary meeting of a concerted EURADOS action called 'Harmonisation and dosimetric quality assurance in individual monitoring for external radiation'. That event represented the start of a new working group in EURADOS: WG2, which aims to foster harmonisation in individual monitoring for external radiation.

EURADOS Action Group: 1997-2000

EURADOS, in December 1996, set up an Action entitled "*Harmonisation and Dosimetric Quality Assurance in Individual Monitoring for External Radiation*". The main objectives of this Action were to assist the consolidation within the EU of the quality of individual monitoring using personal dosimeters and to facilitate harmonised procedures. In order to meet these objectives an Action Group was set up, chaired by David Bartlett (NRPB) and comprising members from each of the EU Member States plus Switzerland. Sub-groups were formed to carry out each of three tasks and prepare a report, assisted by all members of the Action Group. The meetings of the EURADOS Action Group were supported by the European Commission, Directorate General XII, Science Research and Development, under the Nuclear Fission Safety - Reactor Safety, Waste Management and Radiation Protection, Framework Programme (FP) 1994-1998, contract number F14P-CT96-0061

At the time the EU funded EURADOS Concerted Action was chaired by David Bartlett from NRPB - UK (now part of the UK Health Security Agency). In order to promote harmonisation one expert representative of each of the EU Member States (15 at that date) plus one for Switzerland was invited to attend the first meeting and to contribute for the following 3 years to share information, experience and proposals to promote harmonisation and quality assurance in the field of individual monitoring for external radiation. After 3 years the working group put together valuable and up-to-date information on the state of the art of individual monitoring in the 15 EU Member States plus Switzerland with details on the approval procedure to recognize competence for individual monitoring services (IMSS) for legal approval, statistics on

occupational monitoring as well as dosimeters used routinely in each county. Moreover, the first intercomparison to test the dosimetric performance of the systems in routine use was performed in 1999 for whole body dosimeters in photon and neutron fields as well as for extremity dosimeters in photon and beta fields. The work of the Group Members involved liaison with colleagues in the dosimetry, metrology, and regulatory communities in their respective countries.

All data and results were published in a Radiation Protection Dosimetry (RPD) Special Issue (89 (1-2) – 2000). In September 2000 the first Individual Monitoring Workshop was held in Helsinki, following an earlier event held in 1993, in Villigen (Switzerland) exclusively devoted to the introduction of the operational quantities in radiation dosimetry practice (RPD 54 (3-4), 1994). The Helsinki Workshop proceedings were published in a RPD Special Issue (96 (1-3) 2001).

The main conclusion, which is still valid, was that: "*The term harmonisation is sometimes taken to mean making things the same, but really the term means to bring into harmony, that is to make things fit or work together.*". Such aim has always been the motto of EURADOS WG2: *harmonisation as applied to dosimetric services, for example, does not mean that they should all follow exactly the same procedures, any more than different voices should sing the same notes to be in harmony. The dosimetric services should aim to meet the same general requirements, and be in the same 'key', to follow the music in parallel.*

EURADOS WG2 continues the EU funded action: 2001-2010

The value of such a fruitful collaboration, exchange of experience, information, and expertise among experts from research institutes and services of EU Member states was soon clear and EURADOS decided to continue the work even after the end of the EU funded Concerted Action. In the period 2001-2004, the working group, then called EURADOS WG2 – *Harmonisation of Individual Monitoring in Europe* was partially supported by EC's FP5. WG2 was chaired by Janwillem van Dijk from NRG - The Netherlands and was composed by representatives from the 15 EU member States, Switzerland and from the then 10 candidate member States. WG2 continued the work of harmonisation with renewed aims. The integration of information with internal dosimetry information together with the use of electronic dosimeters at that stage already in routine use were included in the 3-year WG2 work programme. Again, all results and data from the study were published promptly and with abundance of details in a RPD

dosimetry Special Issue (112 (1) – 2004). A second European workshop (IM-2005) was also held shortly afterwards in Vienna and its proceedings published as a special issue (125 (1-4) 2007).

EURADOS decided in 2005 to continue the work of WG2 even after the end of the EU funded Concerted Action. In the following years, with again a new chair, Vasiliki Kamenopoulou from GAEC - Greece, WG2 went on with actions to share information, and to investigate the state of the art and challenges of individual monitoring in practice, with new specific aims. In 2007, WG2 presented a proposal to EURADOS Council for two specific actions to be realized to consolidate harmonisation actions and quality assurance procedures: a) to update the EU technical recommendations published in 1994 as Radiation Protection 73 (EUR 14852) and b) to start a self-sustaining intercomparison (IC) series in order to provide external performance tests to European individual monitoring services. The EURADOS Council approved both actions and realized in the following years. The first action was funded by DG-TREN as project “EU-Trimer” (2007-2009) and the then new *European technical recommendations* for monitoring individuals occupationally exposed to external radiation (Radiation Protection n. 160 - RP 160), was published by the European Commission in 2009. In 2008 the first EURADOS inter-comparison devoted to whole body dosimeters for photon fields was successfully organized. Since then, EURADOS IC series has been run regularly covering whole body photon, neutron dosimeters as well as extremity dosimeters too and it welcomes individual monitoring services not only from Europe but also from countries across the world, including the US, Japan and India.

Publications and reports since 2000 were published and disseminated during events now called individual monitoring conferences IM2005 (Vienna) and IM2010 (Athens), endorsed by EURADOS. The IM was also promoted from *European Workshop* to *International Conference on Individual Monitoring* (IM2015, Bruges) and since then their regular organization has been included in EURADOS actions.

EURADOS WG2: recent and regular harmonisation actions 2011-2022

The years from 2010 have seen increasing demand for the intercomparisons by the individual monitoring services and later on for training courses too. The programme of self-sustaining intercomparisons has continued on a regular and reliable basis. The demand for whole body photon dosimeter intercomparisons, taking place in alternate years, more than doubled between 2008 and 2020, when 113 individual monitoring services (IMs) took part. Following initial research-based development by WG12, eye lens dosimeter intercomparisons were added to the programme alongside extremity intercomparisons, with the most recent taking place in 2019. Meanwhile, neutron intercomparisons in 2012, 2017 and 2022 attracted over 30 participants each.

The first training course on *The implementation of RP 160 and lessons learned from intercomparison exercises* was held in Krakow in 2012. Six training courses editions have now taken place, with an average attendance of 40 students. The content of the course, originally intended as part of the dissemination of the 2009 technical recommendations (RP 160), has evolved in the light both of participant feedback and of general developments, e.g., new topics on eye lens dosimetry, greater emphasis on measurement uncertainty and on formal quality assurance programmes.

Other work has also continued. A general survey of IMs was carried out in 2012, following the earlier survey in 2003, and the results published in a EURADOS report. Amongst the findings of the survey was an increasing need for formal quality accreditation, and together with training course feedback this led to WG2 developing a guidance document for services wishing to pursue accreditation against ISO 17025, *General Requirements for the Competence of Testing and Calibration Laboratories*. The document was published, again as a EURADOS report, in 2020.

Another chief responsibility of WG2, in support of harmonisation, is the dissemination of recommendations and good practice. This is achieved via the training courses, via intercomparison participants' meetings, and publications. However, feedback from those courses and meetings, and from meetings at the EURADOS annual meetings (AM), identified that very useful exchanges of ideas occur in informal “coffee-time” contexts. Therefore, WG2 instituted a series of “learning networks” - half-day events where topics of interest could be discussed in small groups. The events are held during the EURADOS AM and are open to anyone attending the AM or the intercomparison participants' meeting. The topics are decided by e-mail conversation with those on the WG2 contacts list, and although the topics are initiated by nominated leaders, the intention is for the learning network participants to discuss amongst themselves and to learn from each other. Again, these events have remained popular since 2017 when they started.

Today, the WG2 programme includes the regular and continuing intercomparisons, training courses and learning networks. Other current tasks include a further wide-ranging survey of IMs, this time in collaboration with the international organization of standardization (ISO); work to investigate improving the quality of PADC (CR39) for neutron dosimetry; and work on information technology in personal dosimetry. WG2 also participate to the EURADOS webinar series started during the pandemic.

New challenges will come up as, for instance, the new published definition of the operational quantities, leading to specific WG2 actions.

Conclusions

WG2 has achieved 25 years of networking and of concrete actions: regular organization of conferences, training courses and intercomparison exercises as well as the preparation of technical recommendations for individual monitoring, and periodic surveys to provide an overview of the practices. All these actions organized by WG2 have become essential, with the demand from IMSs increasing over the years.

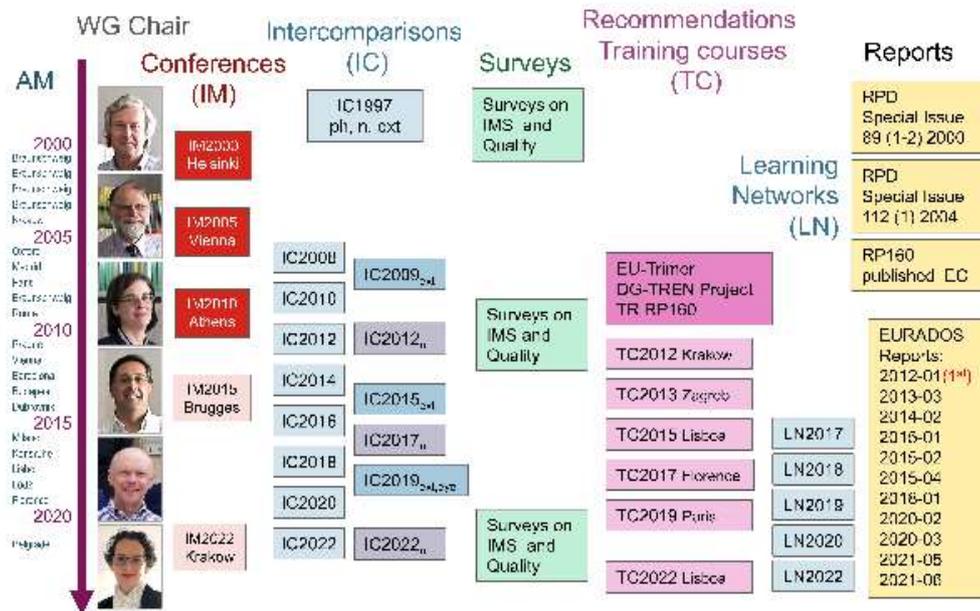
Harmonisation also meaning dissemination, WG2 has paid a specific attention to publish in the open literature all along these 25 years: six RPD special issues, elaboration of the technical recommendations RP 160, 11 EURADOS reports and many papers in scientific journals (<https://eurados.sckcen.be/documents-publications>).

WG2 has adapted over the years to developments in the field (e.g., emergence of new techniques, new regulations, standards) and will hopefully continue to be a major contributor in the future.

This is an opportunity to thank all the people who have collaborated thanks to their reliable work in the smooth running of the different tasks of this WG over so many years, for the interest they have shown more generally. They have been 25 years of work, and 25 years of friendship too.

David Bartlett, Vasiliki Kamenopoulou, Janwillem van Dijk, João Alves, Phil Gilvin, Elena Fantuzzi, Oliver Hupe, Raul Martin Garcia, Hannes Stadtmann, Marie-Anne Chevallier

25 years of EURADOS WG2



In this diagram the pictures/boxes are aligned only roughly to the vertical symbolic time axis.