

The Joint IAEA/ARPANSA Regional Intercomparison Exercise on Individual Monitoring for External Exposure 2018 concluded



The 2018 IC exercise focused on external monitoring, specifically on passive dosimeters (such as TLD, OSL, RPL and film) used for the assessment of Hp(10) and/or Hp(0.07). An irradiation of these dosimeters (restricted to photons) carried out in Primary Dosimetry Standards Laboratory of Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) in terms of Hp(10) and Hp(0.07) in the following ranges:

- Energy: 70 and 662 keV
- Dose equivalent: 1 mSv to 20 mSv
- Angle of incidence: 0° and 20°

The Intercomparison Exercise was announced to Member States in January 2018. Individual Monitoring Services wishing to participate were asked to submit a completed nomination form and questionnaire before 1 June 2018.

The participation of each service in the Exercise was confirmed on 1 June 2018. The participants were required to perform a linearity test of their reader prior to the intercomparison exercise.

A total of 25 dosimeters are required from each participant for this intercomparison exercise:

- 20 dosimeters for irradiation (exposures for each participant will be at 4 different doses).
- 5 dosimeters for background and transit.

The participants were required to send their dosimeters to the irradiation facility, by courier to enable tracking of the packages, such that they arrived by 30 July 2018.

The irradiating facility exposed the dosimeters through August 2018. The irradiating facility then returned the dosimeters to the participants, via courier to enable tracking of the package, throughout September 2018.

The participants were required to evaluate the dose on each of dosimeters and report the net personal dose equivalent, Hp(10), on each of the exposed dosimeters by 30 October 2018.

Meeting report

The participants were provided preliminary results in November 2018. Participants were able to provide corrections or amendments to their results.

An evaluation Workshop to discuss the Intercomparison Exercise and finalise the report was conducted in 19-21 February 2019.

ARPANSA together with the IAEA provided the participating IMS laboratories with a "Certificate of Participation" including information on the irradiation qualities, doses, response values and overall uncertainties for all irradiations.

In brief, a majority of participants are using solid-state dosimeters (TLD or OSL), with only three services continuing to use film badge dosimeters. The majority of participants calibrate their dosimeters against a ^{137}Cs standard traceable to a secondary standards dosimetry laboratory.

Only four participants calibrate their dosimeters against both high- and low-energy sources. With the increasing use of radiation within the health sector, an increasing number of occupational exposures will be to only low-energy radiation. To ensure that the service is fit for monitoring these workers, service providers should calibrate their systems for both high- and low-energy exposures.

All of the participants provided results that were within the acceptable limits defined by the IAEA, for all four exposure scenarios. However, only half of the participants were able to provide results within 15% of the reference value, for each exposure scenario. Furthermore, only a minority of participants reported confidence intervals that included the reference value, for each exposure scenario.