

2021 IAEA REGIONAL INTERCOMPARISON EXERCISE ON INDIVIDUAL MONITORING FOR EXTERNAL EXPOSURE IN AFRICA

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ABSTRACT

The organization of this regional intercomparison exercise on individual monitoring in Africa region was implemented under the framework of IAEA Technical Cooperation Project RAF9068.

The SSDL of CNRP of Morocco hosted this intercomparison exercise (irradiation of dosimeters sent by participating dosimetry service and evaluation of final results).

Results of this intercomparison exercise were discussed during the virtual meeting held on 13-15 December 2021, Vienne – Austria. In this meeting Intercomparison results for each country checked and validated with special interest on consistency, accuracy (trumpet curve criteria compliance); influence of background radiation; unexceptionally too high or too low values; & typographic errors.

Results were analysed country by country to identify specific issues or otherwise in each case.

INTRODUCTION

When the exercise was announced, twenty-three (23) countries sent their application form to participate to the intercomparison exercise. After the intercomparison exercise was launched, two (02) countries requested to participate with two types of dosimeters (OSL and TLD). Participants were asked to send 36 dosimeters used routinely and to give details on the dosimeter reference point.

The final number of participants who sent their dosimeters for irradiation was eighteen (18) and dosimetry systems were twenty (20).

Participants who sent their results were seventeen (17). One country used two readers: Automatic and manual OSL systems. The dosimetry systems to be evaluated are twenty (20). (11 TLD and 09 OSL).

The participants were instructed to follow normal routine procedures during the assessment of the dosimeters and to send the results of the dosimeter readings to the hosting SSDL for evaluation.

In this exercise, two quantities Hp (10) and Hp (0.07) have been evaluated and this intercomparison was designed to be a blind test for all participants who reported their results without knowing the reference dose values.

The SSDL established the irradiation plan and announced the intercomparison in February 2021. After completing the application procedures, the participants sent their dosimeters, in accordance with the instructions, to the SSDL during the period March - June 2021. The laboratory irradiated the dosimeters according to the irradiation plan during the period April - August 2021. The dosimeters were sent back to the participants during the same period. Each participant was instructed to follow normal routine procedures as far as possible.

The participants sent the results of dosimeters readings to the organizer (SSDL CNRP) for evaluation during the period August -20 November 2021.

The performance limits (i.e. trumpet curves) were calculated and represented in the participant's graphs using $H_0 = 0.1 \text{ mSv}$ for H_p (10) and H_p (0.07), as stated in ISO 14146 [4].

Following the work plan, results of this intercomparison exercise were discussed during the virtual meeting held on 13-15 December 2021, Vienne – Austria.

The final individual results were sent to each participant in December 2021.

CONCLUSION

The results show that some participants have a very satisfactory performance and also that a number of services could improve the quality of their systems by improving the calibration of their systems.

Additional information specific to the tested systems and provided by the participants for statistical analysis allowed more detailed analysis of the results with respect to different parameters, e.g. dosemeter type, detector material, and other parameters. The influence of such parameters on the response values of the dosemeters was studied and discussed.

With the aid of the intercomparison results the participants can show compliance within their quality management system, compare their results with those from other participants and develop action plans for improvement of their system.

Summary of all reported average response values as a function of reference dose and energy for all participants in term of *H*p (10)







Summary of all reported average response values as a function of reference dose and energy for all participants in term of *H*p (0.07)





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