
Radiological protection — General requirements for proficiency tests for in vivo radiobioassay

*Radioprotection — Exigences générales concernant les essais
d'aptitude pour les mesures d'anthroporadiométrie (mesures in vivo)*





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Foreword

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The direct (in vivo) measurement of radionuclides emitting penetrating radiations (X- and gamma rays) in the body is an important technique in radiological protection. Along with the appropriate biokinetic and dosimetric models, the results can be used to assess doses due to intakes of radionuclides^[5]. These measurements and assessments are typically done

- routinely among radiation workers in occupational radiation protection, and
- among members of the public, emergency workers or helpers in a nuclear or radiological emergency.

In vivo monitoring may also be used to identify the level of exposure of an individual in a criticality incident through the measurement of activated body sodium^[5].

In vivo measurements may be made by dosimetry laboratories with dedicated facilities, in nuclear facilities using whole-body or partial body scanners, or in hospitals or universities with appropriate equipment. The most common direct (in vivo) methods are whole-body, lung, and thyroid counting.

Participating in performance testing programmes with suitable phantoms is commonly required by national regulatory bodies as part of the accreditation of in vivo dosimetry service laboratories for the validation of bioassay methods. For other facilities making in vivo measurements, such as nuclear facilities, hospitals, and universities, participating in intercomparisons can help monitor the performance, identify problems, and provide education and training opportunities. ISO 28218 provides performance criteria for radiobioassay including in vivo monitoring. The general design requirements and performance characteristics of in vivo measurement instrumentation, including test procedures for performance control, are described in IEC 61582^[4].

General requirements on proficiency testing and statistical methods for evaluation are given in ISO/IEC 17043^[3] and ISO 13528^[2], respectively.

The purpose of this document is to give a fuller set of requirements and recommendations for proficiency test organizers than given in the standards mentioned above, including

- planning and announcement of testing actions,
- selection of radionuclides,
- selection of activities to be used for testing,
- preparation of test sources,
- selection of phantoms,
- measurement of phantoms,
- analysis of results provided by the participants, and
- reporting.

