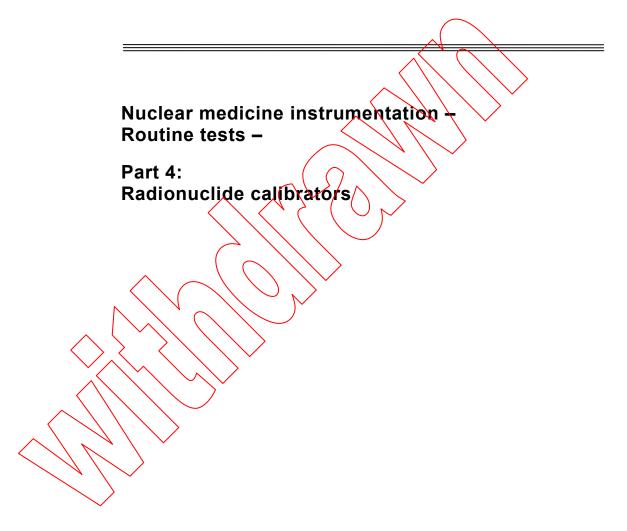
TECHNICAL REPORT

IEC TR 61948-4

First edition 2006-11



© IEC 2006 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



PRICE CODE

_

CONTENTS

FO	REWC	DRD	3	
INT	RODU	JCTION	5	
1	Scop	e and object	6	
2	Norm	rmative references6		
3	Term	ns and definitions6		
4	Test methods			
	4.1	BACKGROUND RESPONSE	8	
	4.2	Constancy of instrument response.	8	
	4.3	SYSTEM LINEARITY	8	
	4.4	Additional checks	8	
	4.5	Frequency of ROUTINE TESTS	8	
Bib	liograp	ohy1	0	
Index of defined terms				
		$\wedge \wedge \rangle (0)$		
Tab	le 1 –	Frequency of ROUTINE TESTS	9	
	<			

INTERNATIONAL ELECTROTECHNICAL COMMISSION

NUCLEAR MEDICINE INSTRUMENTATION – ROUTINE TESTS –

Part 4: Radionuclide calibrators

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between the IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of it technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

The main task of lec technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC 61948-4, which is a technical report, has been prepared by subcommittee 62C: Equipment for radiotherapy, nuclear medicine and radiation dosimetry, of IEC technical committee 62: Electrical equipment in medical practice.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
62C/387/DTR	62C/401/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

In this technical report the following print types are used:

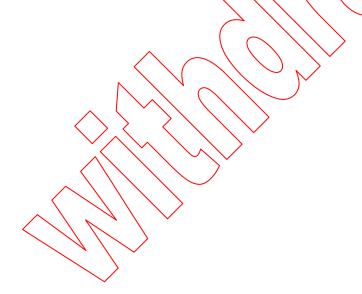
- requirements, compliance with which can be tested, and definitions: in roman type;
- · explanation, advice, introductions, general statements, exceptions and reference: in smaller roman type;
- test specifications: in italic type;
- TERMS DEFINED IN CLAUSE 3 OF THIS TECHNICAL REPORT OR LISTED IN THE INDEX OF DEFINED TERMS: SMALL CAPITALS.

A list of all parts of the IEC 61948 series, published under the general title *Nuclear medicine* instrumentation – Routine tests, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under http://webstore.iec.ch in the data related to the specific publication. At this date, the publication will be

- · reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.



INTRODUCTION

This technical report is based on the German Standard DIN 6855-11, Qualitätsprüfung nuklearmedizinischer Messsysteme – Teil 11: Konstanzprüfung von Aktivimetern, the English document Protocol for Establishing and Maintaining the Calibration of Medical Radionuclide Calibrators and their Quality Control, the Austrian document ÖNORM S 5270, Aktivimeter – Richtlinien für die Konstanzprüfung am Verwendungsort / Radionuclide calibrators – Guidelines for the constancy testing in the field / Calibrateurs de radionucléides – Directives pour l'essai de constance à l'endroit d'utilisation, of 1 April 1998, and the Spanish document Protocolo Nacional del Control de Calidad en la Instrumentación en Medicina Nuclear.



NUCLEAR MEDICINE INSTRUMENTATION – ROUTINE TESTS –

Part 4: Radionuclide calibrators

1 Scope and object

This technical report covers the routine testing of radionuclide calibrators used in nuclear medicine. Such devices utilise ionization chambers of the well type (directly coupled to an appropriate electronic circuitry (IEC 61145)) and a direct readout in units of ACTIVITY. Requirements and specific methods to determine performance parameters are described in IEC 61303 and IEC 61145. These methods are primarily designed for acceptance testing.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60788:2004, Medical electrical equipment - Glossary of defined terms

IEC 61145:1992, Calibration and usage of ionization chamber systems for assay of radionuclides

IEC 61303:1994, Medical electrical equipment – Radionuclide calibrators – Particular methods for describing performance

IEC 61948-1:2001, Nuclear medicine instrumentation – Routine tests – Part 1: Radiation counting systems