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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 14318-2019

Radiation protection instrumentation - Neutron ambient dose equivalent (rate) meters

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Table of Contents

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 14318-2008 "radiation protection instrument neutron dose equivalent (rate) instrument", and GB/T 14318-

The main technical changes in.2008 are as follows.

--- Revised the scope, change "energy below 16MeV" to "energy below 20MeV" (see Chapter 1,.2008 edition)

Chapter 1);

--- Chapter 3 adds alarms (see 3.1.1), background levels (see 3.1.4), approximate quantitative values (see 3.1.7), deviations (see 3.1.8), effects

Quantity (see 3.1.11), F-type impact (see 3.1.12), S-type impact (see 3.1.13), lower limit of the effective measurement range (see

3.1.14), neutron fluence response (see 3.1.22), nonlinear (see 3.1.24), reference response (see 3.1.30), reference standard (see

3.1.31), relative response (see 3.1.32), response of the radiation measuring device (see 3.1.33), standard test conditions (see 3.1.34), standard

Quasi-test values (see 3.1.35), abbreviations and symbols (see 3.3), quantities and units (see 3.4);

---Delete Chapter 4 and incorporate related content (eg instrument identification, instrument indication value, valid measurement range, etc.) into Chapter 5

(See Chapter 5.2, Chapter 4 of the.2008 edition);

--- Added "Monte Carlo calculation of instrument response" (see 6.5);

--- Increased overload characteristics, easy to decontaminate position (see 6.7, 5.3.3,.2008 version 10.1, 10.2);

--- Removed the security feature content (see Chapter 10 of the.2008 edition);

--- Added the content of "Overlay of indicator values" "Software" (see Chapters 7 and 8).

This standard uses the translation method equivalent to IEC 61005.2014 "radiation protection instrument neutron surrounding dose equivalent (rate) instrument."

The documents of our country that have a consistent correspondence with the international documents referenced in this standard are as follows.

---GB/T 2900 (all parts) Electrotechnical terminology [IEC 60050 (all parts)];

--- GB/T 8897.1-2013 Primary batteries Part 1. General (IEC 60086-1.2011, MOD);

--- GB/T 8897.2-2013 Primary batteries Part 2. Dimensions and electrical performance requirements (IEC 60086-2.2011,

MOD);

---GB/T 4208-2017 enclosure protection grade (IP code) (IEC 60529..2013, IDT);

---GB/T 16511-1996 Random documents for electrical and electronic measuring equipment (IEC 61187.1993, IDT);

---GB/T 34138-2017 Environmental, electromagnetic and mechanical performance requirements for radiation protection equipment (IEC 62706.2012, IDT).

This standard has made the following editorial changes.

--- Change the English term "pointoftestadose(rate)equivalentmeter" of 3.1.25 to "pointoftestadose"

Equivalent (rate)meter", the original text is incorrect;

---6.10.1 quoted in 6.10.3 was changed to 6.10.1, the original text is incorrect;

---6.11.1 quoted in 6.11.3 was changed to 6.11.1, the original text is incorrect;

---6.12.2 and 6.13.1 quoted in 6.12.3 were changed to 6.12.1, the original text is incorrect;

---7.1 The third paragraph "deltagmix" was changed to "deltaHimix", the original text is incorrect;

---7.2 (14) "deltaHimix=

HiK HiL Hi (KL)

Hi(KL)

Change to "deltaHimix=

HiK HiL-Hi (KL)

Hi(KL)

"The original text is incorrect;

--- "7L(p,n)" in Table 1 "neutron reference radiation" is changed to "7Li(p,n)", the original text is incorrect;

--- "80A/m" in Table 6 "Magnetic Field" does not match IEC 62706 and is changed to "100A/m".

This standard is proposed and managed by the National Nuclear Instrumentation Standardization Technical Committee (SAC/TC30).

This standard was drafted. Xiamen Metrology Testing and Testing Institute, Xiamen Fuxin Photoelectric Integration Co., Ltd., Xiamen Meiya Zhongmin Technology Co., Ltd.

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Electronics Co., Ltd., Shanghai Renji Instrument Co., Ltd., Xiamen Jieyi Technology Co., Ltd., Xiamen Guangfu Technology Co., Ltd., Guangzhou Yuda

Technology Co., Ltd.

1 Scope

This standard applies to instruments that measure the ambient dose equivalent (rate) produced by neutron radiation below 20 MeV, which includes at least.

a) a detection device, such as a device consisting of a thermal neutron detector and a neutron moderating and absorbing medium surrounding the detector;

b) measuring device with display measurement, which can be integrated with the detection device or can be separated by cable connection

Device.

This standard includes instruments with energy ranges up to 20 MeV. If the instrument also provides an indication of the neutron dose, it should be satisfied with this standard.

The neutron dose requirement.

This standard does not specify test methods for instrument performance requirements in pulsed radiation fields. It is not certain whether the device designed to meet this standard is suitable

Used for pulsed radiation fields.

This standard specifies the performance requirements of the dose equivalent (rate) meter around the neutron and the test side to determine its performance to meet the requirements of this standard.

law. This standard specifies the general characteristics, general test methods, radiation

characteristics, electrical characteristics, mechanical characteristics of the dose equivalent (rate) meter around the neutron.

Sex, safety and environmental characteristics, and the requirements of the certificate of conformity (see 13.2), and the neutron peripheral with alarm function

Requirements and test methods for volume equivalents.

Note. The response of the dose equivalent (rate) meter around the neutron is related to energy and may deviate significantly from the consistency requirement. However, the response in the actual neutron field is not

Deviations from the same energy range tend to cancel each other out, so the response to the actual neutron field tends to be close to uniform.

EJ/T.20086.1-2014 and ISO 12789-2 specify a range of broad spectrum neutron sources suitable for testing such instruments. For example. in the known spectrum

When the environment is tested, the simulation work field specified in EJ/T.20086.1-2014 and ISO 12789-2 can be determined by the manufacturer and the user.

The neutron field.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 14055.1-2008 Neutron reference radiation Part 1. Radiation characteristics and method of production (ISO 8529-1.2001, IDT)

GB/T 14055.2-2012 Neutron Reference Radiation Part 2. Calibration of Radiation Protection Meters Associated with Characterization of Fundamental Radiation Fields

Foundation (ISO 8529-2.2000, IDT)

EJ/T.20086.1-2014 Reference Radiation Field Simulation Workplace Neutron Field Part 1. Radiation Characteristics and Generation Methods (ISO

12789-1.2008, IDT)

ISO 8529-3.1998 Neutron reference radiation - Part 3. Calibration of physic and personal dosimeters and determination of energy and angular response

(Referenceneutronradiation-Part 3.Calibrationofareaandpersonaldosimetersanddeterminationof