

Safety Standards

of the

Nuclear Safety Standards Commission (KTA)

KTA 1505 (2022-11)

**Suitability Verification of the Stationary Measurement
Equipment for Radiation Monitoring**

(Nachweis der Eignung von festinstallierten
Messeinrichtungen zur Strahlungsüberwachung)

The previous versions of this safety
standard were issued in 2003-11, 2011-11 and 2017-11

If there is any doubt regarding the information contained in this translation, the German wording shall apply.

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KTA SAFETY STANDARD

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Suitability Verification of the Stationary Measurement Equipment for Radiation Monitoring

KTA 1505

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PLEASE NOTE: Only the original German version of this safety standard represents the joint resolution of the 35-member Nuclear Safety Standards Commission (Kerntechnischer Ausschuss, KTA). The German version was made public in the Federal Gazette (Bundesanzeiger) on July 25, 2023. Copies of the German versions of the KTA safety standards may be mail-ordered through the Wolters Kluwer Deutschland GmbH (info@wolterskluwer.de). Downloads of the English translations are available at the KTA website (<http://www.kta-gs.de>).

All questions regarding this English translation should please be directed to the KTA office:

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Comments by the Editor:

Taking into account the meaning and usage of auxiliary verbs in the German language, in this translation the following agreements are effective:

shall	indicates a mandatory requirement,
shall basically	is used in the case of mandatory requirements to which specific exceptions (and only those!) are permitted. It is a requirement of the KTA that these exceptions - other than those in the case of shall normally - are specified in the text of the safety standard,
shall normally	indicates a requirement to which exceptions are allowed. However, exceptions used shall be substantiated during the licensing procedure,
should	indicates a recommendation or an example of good practice,
may	indicates an acceptable or permissible method within the scope of this safety standard.

Basic Principles

(1) The safety standards of the Nuclear Safety Standards Commission (KTA) have the task of specifying those safety-related requirements which shall be met with regard to precautions to be taken in accordance with the state of science and technology against damage arising from the construction and operation of the plant (Sec. 7, para. (2), subpara. (3) Atomic Energy Act - AtG) in order to attain the protective goals specified in the AtG, the Radiation Protection Act (StrlSchG) and the Radiation Protection Ordinance (StrlSchV) as well as further detailed in the Safety Requirements for Nuclear Power Plants (SiAnf) and the Interpretations of the SiAnf.

(2) The protection from ionizing radiation of persons inside and outside of the plant as well as the monitoring of the specified normal function of the equipment designated for

- retaining solid, liquid and gaseous radioactive substances within the designated enclosures,
- handling and the controlled conduction of radioactive substances within the plant, and
- monitoring the discharge of radioactive substances

is achieved among others by the stationary and the mobile radiation protection instrumentation. Safety standards series KTA 1500 specifies detailed safety-related requirements for this radiation protection instrumentation.

(3) Sec. 90 para. 1 and 5 StrlSchV, among others, requires that the radiation measurement equipment for measuring the personal dose, local dose, local dose rate, surface contamination and the activity concentration in air and water shall be suited to meet the requirements of the measurement objective.

(4) The present safety standard KTA 1505 specifies the procedures and requirements for stationary radiation measurement equipment with regard to

- a) equipment-specific qualification, i.e., verification of the characteristics of the measurement equipment,
- b) plant-specific suitability check, and
- c) supplementary tests (cf. Section 6.3)

by which it is verified that the requirements in accordance with Sec. 90 para. 1 and 5, sentence 1a) StrlSchV are met.

(5) Requirements with regard to quality assurance are specified in safety standard KTA 1401.

1 Scope

(1) This standard applies to the suitability verification of the stationary radiation and radioactivity measurement equipment – and of the functional modules contained therein – that is permanently installed in nuclear power plants and research reactor facilities, especially with regard to fulfilling the requirements of Sec. 90 para. 1 and 5 StrlSchV. It applies to all stationary measurement equipment within the scopes of the safety standards KTA 1501, KTA 1502, KTA 1503.1, KTA 1503.2, KTA 1503.3, KTA 1504 and KTA 1507.

(2) This safety standard does not apply to the supply systems and serially connected instrumentation and control systems that are not assigned exclusively to the measurement equipment specified under para. 1.

2 Definitions

(1) Measurement equipment, stationary

Stationary measurement equipment within the scopes of the safety standards KTA 1501, KTA 1502, KTA 1503.1, KTA 1503.2, KTA 1503.3, KTA 1504, and KTA 1507 are such equipment

- a) that is permanently installed,

- b) that is connected to the control system and power supply, and
- c) where the measurement signals are displayed and recorded in the control room.

(2) Functional monitoring during type testing

Functional monitoring during type testing is a test procedure by which the functional capability of the test objects is continuously monitored when performing the individual type testing steps.

(3) Intermediate functional test during type testing

Intermediate functional test during type testing is a test procedure by which the functional capability of the test objects is checked at particular hold points between certain type testing steps.

(4) Critical load test

The critical load test is a test by which the behavior of the measurement equipment with respect to its individual measurement task is determined for the worst possible combination of operating and ambient conditions.

(5) Measurement equipment

Measurement equipment encompasses all measurement and auxiliary devices necessary for determining a measurement parameter, for transmitting and adjusting the measurement signal and for displaying the measured value as a representation of the measurement parameter.

(6) Plant-independent tester (radiation and radioactivity surveillance)

Plant-independent tester is a person competent in the field of radiation and radioactivity surveillance who, in accordance with legal requirements, standards, guidelines, provisions or orders, is required to be consulted during a test. This person shall neither be involved in the manufacturing or marketing of the measurement equipment to be tested, nor shall this person represent other interests of the manufacturer.

3 Verification of Suitability

3.1 General Objective

(1) Within the framework of the nuclear licensing and supervisory procedures it shall be verified that the measurement equipment is suited for the respective measurement objective.

(2) The suitability of measurement equipment is considered verified if it is documented that the individual measurement equipment achieves the measurement objective at the location assigned to this equipment and for the particular operating and ambient conditions.

3.2 Procedure

3.2.1 Description of measurement task

(1) The measurement task shall be described. This shall present the measurement objectives, the measurement parameters to be determined, the requirements from the Radiation Protection Act (StrlSchG), the Radiological Protection Ordinance (StrlSchV) and from KTA safety standards as well as the safety-related and radiological significance of the measurement results.

(2) The ambient conditions at the designated measurement location as well as the possible influence parameters affecting the measurements shall be determined for the respective measurement equipment. Any resulting special requirements for the measurement equipment or for the functional units contained therein shall be specified.