

Safety Standards

of the
Nuclear Safety Standards Commission (KTA)

KTA 3502 (2012-11)

Accident Measuring Systems

(Störfallinstrumentierung)

The previous version of this safety
standard was issued in 1984-11

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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Accident Measuring Systems

KTA 3502

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PLEASE NOTE: Only the original German version of this safety standard represents the joint resolution of the 50-member Nuclear Safety Standards Commission (Kerntechnischer Ausschuss, KTA). The German version was made public in the Bundesanzeiger (BAnz) of January, 23th, 2013. Copies may be ordered through the Wolters Kluwer Deutschland GmbH, Postfach 2352, 56513 Neuwied, Germany (Telefax +49 (0) 2631 801-2223, E-Mail: info@wolterskluwer.de).

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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 AtG and the Radiological Protection Ordinance (StrlSchV) and further detailed in the "Safety Criteria" and in the "Design Basis Accident Guidelines".

(2) Criterion 5.2 "Incident Instrumentation" of the Safety Criteria specifies that equipment for measuring and recording must be provided which, during and after design basis accidents and in the case of unpredictable event sequences

- will deliver sufficient data regarding the condition of the plant in order to make it possible to initiate the required protective measures with respect to personnel and plant,
- will give indications on the sequence of events and will enable the documentation of this sequence, and
- will enable estimating the effects on the environment.

(3) In accordance with Sec. 53 StrlSchV, the owner of a nuclear facility has the obligation to provide on the site of the plant all auxiliary means that are necessary to mitigate damages in the case of personal accidents and design basis accidents. This obligation extends to having to provide the necessary information to the competent authorities on the sequence of events of the design basis accident.

(4) The present safety standard specifies requirements for the design and construction of accident measuring systems for achieving the objectives in accordance with Sec. 53 StrlSchV. It is permissible, however, to fulfill these requirements by other measures.

(5) The present safety standard is based on the assumption that the conventional regulations and standards (e.g., German Accident Prevention Regulations, DIN standards and VDE regulations) are observed.

(6) Requirements regarding lightning protection are specified in safety standard KTA 2206.

(7) Requirements regarding cable penetrations through the containment vessel are specified in safety standard KTA 3403.

(8) Requirements regarding pipe penetrations through the containment vessel are contained in safety standard KTA 3407.

(9) Requirements regarding the arrangement of the display and recording equipment in the control room, the remote shutdown station and the local control stations are specified in safety standard KTA 3904.

(10) A number of measurement parameters specified in safety standard series KTA 1500 also pertain to the accident measuring system, thus supplementing the radiological and meteorological measurement parameters specified in Sections 3 and 5 of the present safety standard. With regard to these measurement parameters, the design and construction requirements for the accident measuring system are specified in safety standards series KTA 1500.

(11) With regard to the electrical power supply, safety standards KTA 3701 through KTA 3705 supplement the corresponding requirements specified in Sections 3.5, 5.4 and 6.3 of the present safety standard.

1 Scope

(1) This safety standard applies to the accident measuring system of stationary nuclear power plants with light water reactors.

This safety standard does not apply to:

- the equipment of the reactor protection system including the hazard alarm system,
- that part of the instrumentation necessary or provided solely for the performance of specified normal operating tasks,
- the nuclear power plant remote surveillance system.

(2) Requirements that do not specifically concern the accident measuring system are not dealt with in the present safety standard.

Note:

Requirements that do not specifically concern the accident measuring system are, e.g., requirements that pertain to equipment for the clarification of operational malfunctions and are based on other engineering standards or requirements. This also includes accident management measures.

2 Definitions

Note:

The hierarchy of the terms defined in the present safety standard is shown in **Figure 2-1**.

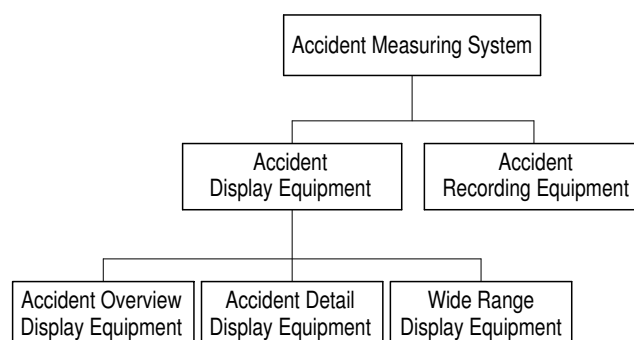


Figure 2-1: Hierarchy of terms of the accident measuring system

(1) Authorized expert

Authorized expert is a competent person or agency consulted in accordance with Sec. 20 AtG by the licensing or supervisory authority.

(2) Design basis accident

A design basis accident is a chain of events upon the occurrence of which the plant operation or the work activity cannot be continued for safety-related reasons and which, with respect to the plant operation, was considered in the plant design or for which, with respect to the work activity, precautionary protective measures shall be provided.

(3) Accident display equipment

The accident display equipment is that part of the accident measuring system which displays the measurement parameters needed as information on the condition of the plant.

Note:

The accident display equipment includes all components required for this display, i.e., equipment of the measured value detection, transmission, processing and display.

(4) Accident recording equipment

The accident recording equipment is that part of the accident measuring system which records the