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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 12789.3-2025

Replacing GB/T 12789.3-1992

**Criteria for nuclear reactor instrumentation - Part 3: High
temperature gas-cooled reactor**

核反应堆仪表准则 第3部分：高温气冷反应堆

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is part 3 of GB/T 12789 "Criteria for nuclear reactor instrumentation". GB/T 12789 has been published in the following parts.

- Part 1: General principles;
- Part 2: Pressurized water reactor;
- Part 3: High temperature gas-cooled reactor;
- Part 4: Liquid metal cooled fast reactor.

This document replaces GB/T 12789.3-1992 "Criteria for Nuclear Reactor Instrumentation Part 3: High Temperature Gas-Cooled Reactors" and Compared with GB/T 12789.3-1992, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Changed the description of the scope (see Chapter 1, Chapter 1 of the 1992 edition);
- Changed the description of fuel temperature measurement (see 6.2, 5.3 of the 1992 edition);
- Changed the description of coolant temperature measurement (see 6.4, 5.5 of the 1992 edition);
- Added description of temperature measurements important to reactor safety (see 6.5);
- Changed the coolant flow measurement method examples (see 7.2, 6.2 of the 1992 edition);
- Modified the conditions and special actions for triggering emergency shutdown of the reactor coolant system coolant leakage (see 7.5.2, 1992 edition 6.5.2);
- Deleted the description of protection actions (see 6.8.1 of the 1992 edition);
- Changed the description of coolant humidity monitoring (see 7.8, 1992 edition, 6.8.2);
- Changed the emergency shutdown monitoring parameters (see 8.1, 7.1 of the 1992 edition);
- Changed the description of the dedicated safety facilities (see 8.2, 7.2 of the 1992

edition);

--- Deleted the relevant description of reactor control (see Chapter 11 of the 1992 edition).

Introduction

GB/T 12789 "Guidelines for Nuclear Reactor Instrumentation" is intended to consist of four parts.

--- Part 1: General principles. The purpose is to specify the principles necessary for the safe operation of pressurized water reactors, high temperature gas-cooled reactors, and liquid metal-cooled fast reactors.

The required special instruments and general principles of their application.

--- Part 2: Pressurized water reactor. The purpose is to supplement Part 1 and specify the general requirements for pressurized water reactor type instrumentation and its application.

in principle.

--- Part 3: High temperature gas-cooled reactor. The purpose is to supplement Part 1 and specify the instrumentation and General principles for its application.

--- Part 4: Liquid metal cooled fast reactor. The purpose is to supplement Part 1 and specify the fast reactor instrumentation and its application.

General principles.

Nuclear Reactor Instrumentation Guidelines Part 3: High temperature gas-cooled reactors

1 Scope

This document specifies the general requirements for the special instruments and their applications necessary for the safe operation of high temperature gas-cooled reactors, including general requirements, medium Related requirements for sub-injection rate measurement, temperature measurement, coolant measurement, protection system, instrument power source, control facilities and alarm system.

This document applies to the design and implementation of instrumentation and controls for indirect cycle high temperature gas-cooled reactors.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version

(including all amendments) applies to this document.

GB/T 12789.1-2025 Nuclear reactor instrumentation standards Part 1: General principles

GB/T 13284 Nuclear power plant safety system design criteria

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 General requirements

The overall requirements for high temperature gas-cooled reactors should meet the requirements of 4.1 to 4.6 in GB/T 12789.1-2025.

5.1 General requirements

Neutron fluence rate measurement should meet the requirements of 5.1 in GB/T 12789.1-2025.

5.2 Neutron Detector

Neutron detectors should meet the requirements of 5.2 in GB/T 12789.1-2025.

5.3.1 General requirements

Neutron injection rate measuring instruments should meet the requirements of 5.3.1 in GB/T 12789.1-2025.

5.3.2 Linear current measuring instrument

Linear current measuring instruments should meet the requirements of 5.3.2 in GB/T 12789.1-2025.