



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

GB/T 11807-2021

**Characteristics, design and operational procedures for acoustic
monitoring systems of loose parts detection important to safety
in nuclear power plants**

Issued on: December 31, 2021

Implemented on: July 1, 2022

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

foreword

1 Scope

2 Normative references

3 Terms and Definitions

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 of Standardization Documents"

drafted:

This document replaces GB/T 11807-2008 "Characteristics, Design and Operational Procedures for Acoustic Monitoring Systems for Detecting Loose Parts", and

Compared with GB/T 11807-2008, in addition to structural adjustment and editorial changes, the main technical changes are as follows:

--- Modified the scope of the standard (see Chapter 1, Chapter 2 of the:2008 edition);

--- Added normative references (see Chapter 2);

--- Added the terms "alarm monitor", "monitoring signal", "known event" and their definitions (see 3:11, 3:12, 3:13);

--- Delete the terms "monitoring area", "foreign object", "frequency distribution of burst wave interval", "frequency distribution of burst wave amplitude", "system spirit"

"Sensitivity" "passband" and its definition (see 2:1, 2:2:3, 2:7, 2:8, 2:10, 2:11 of the:2008 edition);

--- Modified the terms and definitions "loose parts", "structure sound" and "noise floor" (see 3:1, 3:4, 3:6, 2:2, 2:3,:2008 edition)

2:5);

--- Modified the general description about loose parts monitoring (see Chapter 4, Chapter 3 of the:2008 edition);

--- Revised "Characteristics and design requirements of each functional unit of the monitoring system" (see Chapter 5, Chapter 4 of the:2008 edition);

--- Revised the relevant requirements of the initial start-up test (see Chapter 6, Chapter 5 of

the:2008 edition);

--- Revised the relevant requirements of the supervision program (see Chapter 7, Chapter 6 of the:2008 edition);

--- Added the description of the loose parts monitoring system in the document requirements [see Chapter 8 a)];

This document is modified to adopt IEC 60988:2009 "Acoustic monitoring systems for detecting loose parts of instruments important to safety in nuclear power plants:

Characteristics,

Design Criteria and Operating Procedures:

This document has been structurally adjusted compared to IEC 60988:2009:

---3:1~3:13 correspond to 3:9, 3:7, 3:10, 3:18, 3:16, 3:3, 3:17, 3:14, 3:15, 3:6, 3:2, 3:11, 3:8;

---Divided some clauses of IEC 60988:2009:

The technical differences between this document and IEC 60988:2009 and their reasons are as follows:

--- In order to meet the requirements of the preparation of Chinese standards, the scope of the standard has been revised:

--- Regarding normative reference documents, this document has made adjustments with technical differences to adapt to the technical conditions of our country and the circumstances of the adjustment:

The situation is reflected in Chapter 2 "Normative References", and the specific adjustments are as follows:

* Replacing IEC 61226 with GB/T 15474 modified to adopt international standards (see 5:1:2);

* Replace IEC 61513 (see 5:1:2) with NB/T:20026 modified to adopt international standards:

--- In order to meet the compilation requirements of Chinese standards, the terms "burst wave interval distribution" and "burst wave amplitude" in IEC 60988:2009 are deleted:

Distribution", "Single Channel Alarm Suppression", "Adaptive Resonance Frequency", "Resonance Factor" and their definitions:

--- Put some annotations of IEC 60988:2009 in the text:

The following editorial changes have been made to this document:

--- In order to harmonize with existing standards, the name of the standard is changed to "Characteristics, design and

Operating Procedures":

Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents:

1 Scope

This document specifies the characteristics, design requirements and operating procedures of acoustic monitoring systems for loose components of nuclear power plant reactor coolant systems:

This document applies to the design and operation of a monitoring system for loose parts of a reactor coolant system:

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, dated citations

documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to

this document:

GB/T 15474 Classification of instrumentation and control functions important to safety in nuclear power plants (GB/T 15474-2010, IEC 61226:2005,

MOD)

NB/T:20026 General requirements for instrumentation and control systems important to safety in nuclear power plants (NB/T:20026-2014, IEC 61513:2011,

MOD)

3 Terms and Definitions

The following terms and definitions apply to this document:

3:1

loosepart

A collective term for fallen parts, loose parts and residues during construction, refuelling and maintenance of nuclear power plants:

3:2

detachedpart

A component that has lost connection to a component within the pressure boundary of the reactor coolant and thus can be carried by the reactor coolant:

3:3

loose parts loosenedpart

A part that has been loosened but remains connected to the original fixed part:

3:4

structure-borne sound

Sounds with frequencies in the audible range propagating on the surface of metal structures:

3:5

sound sensor

A transducer that converts a mechanical signal to an electrical signal and receives sound at the outer surface of the reactor coolant pressure boundary, which is assisted by a bit motion, velocity or acceleration detection:

Note: Sound sensors in this document refer to sensors that detect "structure sound":