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**Guide for selection and use of lead acid battery monitoring  
system in stationary applications of nuclear power plant**

核电厂固定式铅酸蓄电池监测系统选择与使用指南

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## Foreword

This document is a standard or guiding technical document. This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Nuclear Instruments and Meters (SAC/TC30). This document was drafted by: Shanghai Nuclear Engineering Research & Design Institute Co., Ltd., Shenzhen CGN Engineering Design Co., Ltd., and China Nuclear Power. Engineering Co., Ltd., China Nuclear Energy Technology Co., Ltd. The main drafters of this document are. Ni Dan, Duanmu Yuxiang, Huang Dongyan, Sun Hao, Liu Chen, Jiang Bowen, Xiao Mengnan, Wei Yuning, Cai Weichong, and Wang Sicong. Lu Yanyun, Jiang Songfang, Ming Hao, Zhang Yunshu, Liu Xin, Zhou Ziyu. Selection of stationary lead-acid battery monitoring system for nuclear power plants User Guide

## 1 Scope

This document gives guidance on selecting and using monitoring systems for the stationary lead acid batteries installed in nuclear power plants: what such a system has to measure, how it is chosen for a given installation, and how its output is used. The station battery is the last line of defence. When offsite power is lost and the diesels have not yet picked up, it carries the instrumentation and the control circuits, and a cell that has quietly degraded is discovered at exactly the wrong moment. Continuous monitoring exists so that degradation is found on a Tuesday rather than during a station blackout, which is why the selection of the monitoring system is treated as a safety question rather than a maintenance one.

Issued on 3 December 2025 by SAMR and SAC as a guiding technical document, in force

from the same day, under the technical jurisdiction of the Standardization Administration of China.

This document provides information on the system composition and characteristics of battery monitoring systems, nuclear safety considerations, and other application considerations. Suggestions regarding factors, measurement parameters, etc. This document applies to the selection of battery monitoring systems for exhaust-type lead-acid batteries and valve-regulated lead-acid batteries in the DC systems of nuclear power plants. With use.

## 2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 13286-2021 Criteria for Independence of Electrical Equipment and Circuits in Nuclear Power Plants (Safety Level) DL/T 2226-2021 Technical Specifications for Online Monitoring System of Valve-Regulated Lead-Acid Battery Packs for Electric Power NB/T.20028.4 Storage Batteries for Nuclear Power Plants - Part

## 3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 A permanently installed system capable of real-time and continuous collection, storage, and reporting of critical battery operating parameters. Currently, the status of the battery pack is being monitored online.

3.2 Voltage sag coupdefouet The initial voltage drop and recovery process experienced by a lead-acid battery during discharge.

3.3 Ripple The periodic deviation relative to the arithmetic mean of DC voltage.

Note. An AC component characterized by a uniform waveform in a DC circuit, usually expressed as the peak value, peak-to-peak value, or root mean square (RMS) of the current or voltage. [Source: GB/T 2900.19-2022, 3.2.5.2, with modifications]

3.4 thermal runaway A critical state that occurs during charging, caused by the rate at which the battery pack generates heat exceeding its heat dissipation capacity, leading to a continuous rise in temperature. This can lead to the destruction of the battery pack. [Source: GB/T 2900.41-2008, 482-05-54]