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

GB/T 13976-2021

Replacing GB/T 13976-2008

**Radioactive source term of pressurized water reactor nuclear
power plant for operation states**

压水堆核电站运行状态下的放射性源项

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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 of Standardization Documents" drafted: This document replaces GB/T 13976-2008 "Radioactive Source Items in the Operating State of Pressurized Water Reactor Nuclear Power Plant", and GB/T 13976-2008 In contrast, except for structural adjustments and editorial changes, the main technical changes are as follows:

--- Changed the scope of application of the document, the scope of application of the document is no longer limited to U-tube steam generator pressurized water reactor nuclear power plants (see Chapter 1, Chapter 1 of the:2008 edition);

--- Added the relevant content of the tritium source term analysis criteria (see Chapter 6);

--- Added the relevant content of the ^{14}C source term analysis criteria (see Chapter 7);

--- Changed the method for calculating the specific activity of radionuclides in the main fluid (see Chapter 4 of 8:1, 8:2, :2008 edition);

--- Added analysis criteria for emission source items of fission products and corrosion activation products (see 8:3, 8:4): Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed and managed by the National Nuclear Energy Standardization Technical Committee (SAC/TC58): This document is drafted by: Shanghai Nuclear Engineering Research and Design Institute Co., Ltd: The main drafters of this document: Qiu Zhongming, Mei Qiliang, Fu Yaru, Mao Lanfang, Sun Dawei, Li Hui, Ding Qianxue, Gao Shengqin, Ding Hongchun, Zhou Yan: The previous versions of this document and its superseded documents are as follows:

---First published in:1992 as GB/T 13976-1992, first revised in:2008;

---This is the second revision: Radioactive Source Items in Operational State of Pressurized Water Reactor Nuclear Power Plants

1 Scope

GB/T 13976-2021 is the Chinese national standard on radioactive source term of pressurized water reactor nuclear power plant for operation states, in the field of energy and heat transfer engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 31 December 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 July 2022. Classification: ICS 27.120.10, CCS F72. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the general principles for the analysis of effluent emission source terms under the operating state of pressurized water reactor nuclear power plants, as well as tritium, ¹⁴C, fission products and Emission source term analysis criteria for corrosion activation products: This document applies to the evaluation of annual releases of radionuclides to the environment through liquid and gaseous effluents from pressurized water reactor nuclear power plants:

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 6249 Nuclear Power Plant Environmental Radiation Protection Regulations

3 Terms and Definitions

The following terms and definitions apply to this document: 3:1 operational states A general term for two states of normal operation and expected operation events: 3:2 normal operation The operation of a nuclear power plant within specified operating limits and conditions: 3:

3 Anticipated operation events anticipated operational occurrences Various operations that are expected to occur at least once during the operating life of a nuclear power plant and deviate from normal operation without causing damage to items important to safety Process: 3:4 chemical waste chemical waste Liquids with high levels of detergents, regenerants or other chemicals: NOTE: This liquid comes mainly from decontamination systems, resin regeneration wastewater, and laboratory wastewater: 3:

5 Detergent waste of washing waste Liquids containing detergents, soaps or similar organic substances:

Note: This liquid is mainly from laundry water, personnel shower water, and decontamination waste liquids of those equipment with low levels of radioactivity: 3:

6 Hydrophobic floordrains Tritium-free, oxygen-containing, high-conductivity, non-primary coolant-quality liquids:

Note: This liquid mainly comes from the plant sewage collection pit, ground drain and sampling station drain:

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