ICS 27.120.20
CCS F69

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 17569-2021

Replacing GB/T 17569-2013

Classification for the items of pressurized water reactor nuclear power plants

压水堆核电厂物项分级

Issued on: October 11, 2021 **Implemented on: May 1, 2022**

Issued by: State Administration for Market Regulation;
Standardization Administration of China

Table of Contents

1 Scope 1
2 Normative references 1
3 Terms, definitions and abbreviations 1
3.1 Terms and definitions 1
3.2 Abbreviations 2
4 General requirements 3
4.1 General requirements for classification 3
4.2 Classification and basic basis 4
5 Safety rating 4
5.1 Overview of the safety classification process 4
5.2 Identifying safety functions 6
5.3 Determine the mitigation safety function classification 8
5.4 Determine design precautions 11
5.5 Grading objects 12
5.6 Completeness and correctness of item classification 17
5.7 General requirements for item classification 17
6 Seismic classification 19
6.1 General requirements 19
6.2 Seismic Class I 19
6.3 Seismic Class II 19
6.4 Non-nuclear seismic class 19
7 Selection of engineering design rules 19
7.1 General requirements of engineering design rules 19
7.2 System design requirements 20
7.3 Specification requirements for structures and equipment 20
8 Quality Assurance Level 21
8.1 General requirements 21
8.2 Quality Assurance Level 1 21
8.3 Quality Assurance Level 2 21
8.4 Quality Assurance Level 3
29 Table D.2 The relationship between the safety level of electrical instrument control systems and equipment and engineering design rules 30

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" Drafting. This document replaces GB/T 17569-2013 "Classification of Items for Pressurized Water Reactor Nuclear Power Plants". Compared with GB/T 17569-2013, except for structural adjustment In addition to the overall and editorial changes, the main technical changes are as follows:

a) Relevant terms, definitions and abbreviations in Chapter 3 have been revised in accordance with the changes in the content of the document (see Chapter 3, Chapter 3 of the.2013 edition);

b) Change the "General Provisions" to "General Requirements", and refer to the latest domestic and foreign materials, reorganize the content (see Chapter 4), and list them as 2 articles (see 4.1, 4.2), instead of the original 4 (see 4.1, 4.2, 4.3,

4.4 in the.2013 edition); the new 2 is "General Requirements for Classification" and "Division Level types and basic basis";

c) Six articles (see 5.1~5.6) are added to Chapter 5, which fully explain the methodology of item "Classification process overview" "Identify safety functions" "Determine the mitigation safety function classification" "Determine design precautions" "Classification objects" "Items The completeness and correctness of the classification"; the original safety classification example in Chapter 5 (see 5.2~

5.6 in the.2013 edition) is moved to Appendix C (informative) "Item Safety Classification Sample", and adapted specific items according to the classification method and code in Chapter

5 Responsive modification;

d) Refer to the latest safety classification material SSG-30 of the International Atomic Energy Agency to supplement the safety classification requirements and increase the response Design the safety classification requirements of the extended working condition equipment (see 5.3.2, 5.7, etc.);

e) According to HAD102/02-2019 and the practical experience of domestic PWR nuclear power plant engineering, the seismic requirements have been revised and added The seismic requirements of items that respond to the design expansion conditions (see 6.1~6.3);

f) Amend "Determination of Code Level and Selection of Standards" to "Selection of Engineering Design Rules" (see Chapter 7). Please note that some of the contents of this document may involve patents. The issuing agency of this document is not responsible for

identifying patents. This document was proposed and managed by the National Nuclear Energy Standardization Technical Committee (SAC/TC58). Drafting organizations of this document. Institute of Nuclear Industry Standardization, Nuclear and Radiation Safety Center of Ministry of Ecology and Environment, China General Nuclear Power Engineering Co., Ltd., China Nuclear Power Engineering Co., Ltd., China Nuclear Power Research and Design Institute, Shanghai Nuclear Engineering Research and Design Institute Co., Ltd. The main drafters of this document. Zhang Xueyao, Lu Yan, Sun Zaozhan, Si Hengyuan, Zhang Huafeng, Jiang Huiyu, Cai Kewei, Yu Xiaoquan, Zhang Huaiyuan, Chu Qibao, Zhao Danni, Qiao Ning, Ji Jiangwei, He Fan, Liang Xueyuan, Deng Ruiyuan, Yao Weida, Li Dongyuan, Hu Zongwen, Huang Jun, Wu Feifei, Liu Shangyuan, Sun Yecong, Jin Wujian, Xiong Guangming, Niu Jingjuan, Yang Wen, Dong Ruilin, Wang Jiayun, Xu Yu, Sun Qian, Yuan Xia, Zhao Ke. The previous versions of the documents replaced by this document are as follows:

---In.1998, it was first published as GB/T 17569-1998, and it was first revised in.2013.

---This is the second revision. Item classification of PWR nuclear power plant

1 Scope

GB/T 17569-2021 is the Chinese national standard on classification for the items of pressurized water reactor nuclear power plants, 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 11 October 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 May 2022. Classification: ICS 27.120.20, CCS F69. 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 requirements for the safety classification, seismic classification, selection of engineering design rules, and quality assurance classification for PWR nuclear power plants And rules. This document is applicable to the classification of PWR nuclear power plant items. Other reactor-type nuclear power plants can refer to this document.

2 Normative references

The content of the following documents constitutes an indispensable clause of this document through normative references in the text. Among them, dated quotations Only the version corresponding to the date is applicable to this document; for undated reference

documents, the latest version (including all amendments) is applicable to This document. HAF003 Nuclear Power Plant Quality Assurance Safety Regulations

3 Terms, definitions and abbreviations

3.1 Terms and definitions The following terms and definitions apply to this document.

3.1.1 Item Generic term for structures, systems or components.

3.1.2 Items important to safety Items that are part of a certain safety combination, or whose failure or malfunction may cause radiation exposure to plant personnel or the public.

3.1.3 Reactor coolant pressure boundary; RCPB All components that bear the pressure of the reactor coolant, including pressure vessels, pipes, pumps, valves, etc., are.

a) The components of the reactor coolant system;

b) The part connected to the reactor coolant system. 1) For the system pipeline, up to and including the outermost isolation device during the normal operation of the reactor; 2) For the reactor coolant safety relief system, up to and including the safety relief valve.

3.1.4 Activecomponent Components that rely on external inputs such as triggers, mechanical movements, or power sources to perform their functions.

3.1.5 Active safety system activesafetysystem A safety system that mainly relies on active components (pumps, active valves, power equipment, etc.) to perform safety functions.