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

GB/T 16702.4-2025

Replacing GB/T 16702-2019

**Design specification for mechanical components in nuclear
island of pressurized water reactor nuclear power plants - Part
4: Class 3 components**

压水堆核电站核岛机械设备设计规范 第4部分：3级设备

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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 4 of GB/T 16702 "Design Specification for Mechanical Equipment of Nuclear Island in Pressurized Water Reactor Nuclear Power Plant". The following parts are published.

2. Class 1 equipment;

- 3.Level 2 equipment;
- 4.Level 3 equipment;
- 5.Small equipment;
- 6.Reactor internals;
- 7.Equipment support;
- 8.Low-pressure or atmospheric pressure storage tanks. This document replaces Chapter

1 Scope

GB/T 16702.4-2025 is the Chinese national standard on design specification for mechanical components in nuclear island of pressurized water reactor nuclear power plants - part 4: class 3 components, 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 28 February 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 28 February 2025. Classification: ICS 27.120.20, CCS F 69. 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 materials, design, manufacturing, inspection, testing and overpressure protection of Class 3 equipment in the nuclear island mechanical equipment of a pressurized water reactor nuclear power plant. Require. This document applies to Level 3 pressure equipment and its components of pressurized water reactor nuclear power plants specified in GB/T 16702.1-2025.

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 16702.1-2025 Specification for design of mechanical equipment for pressurized water reactor nuclear island Part

3 Level 2 equipment

GB/T 16702.7 Specification for design of mechanical equipment for pressurized water reactor nuclear island Part

7.Equipment support NB/T.20001-2023 Specification for the manufacture of mechanical equipment for nuclear island of pressurized water reactor nuclear power plant NB/T.20002 (all parts) Specification for welding of mechanical equipment in nuclear island of pressurized water reactor nuclear power plant NB/T.20005.1 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

1.Forgings and rolled products for level 1, 2 and 3 equipment NB/T.20005.2 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

2.Tube sheet forgings for 2nd and 3rd stage heat exchangers NB/T.20005.5 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

5.Grade 1, 2 and 3 pressure-bearing castings NB/T.20005.7 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

7.Steel plates for level 1, 2 and 3 equipment NB/T.20005.9 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

9.Seamless steel tubes for level 2 and 3 equipment NB/T.20005.10 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

10.Grade 2 and 3 steel pipes welded with filler metal NB/T.20005.13 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

13.Seamless steel for heat transfer tubes in 2nd and 3rd stage heat exchangers Steel pipe NB/T.20005.14 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

14.Grade 2 and 3 butt-weld seamless pipe fittings NB/T.20005.15 Carbon steel and low alloy steel for pressurized water reactor nuclear power plants Part

15.Grade 2 and 3 pipe fittings welded with filler metal NB/T.20007.1 Stainless steel for pressurized water reactor nuclear power plants Part

1.Austenitic stainless steel forgings for level 1, 2 and 3 equipment NB/T.20007.2 Stainless steel for pressurized water reactor nuclear power plants Part

2.Austenitic stainless steel forgings for tube sheets of 2nd and 3rd stage heat exchangers NB/T.20007.5 Stainless steel for pressurized water reactor nuclear power plants Part

5.Austenitic stainless steel plates for level 1, 2 and 3 equipment NB/T.20007.8 Stainless steel for pressurized water reactor nuclear power plants Part

7 Level

3 Equipment of GB/T 16702-2019 "Design Specifications for Mechanical Equipment of

Nuclear Island of Pressurized Water Reactor Nuclear Power Plant". Compared with Chapter 7 in GB/T 16702-2019, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- Increased the scope of applicable jurisdiction and detailed provisions on the boundaries of level 3 equipment components and accessories (see 4.2);
- Changed some of the adopted material standards, adopted the material standard unification and material branding carried out in the unification of the two technical routes. The results of the unification of the number (see 5.2, 7.2.2 of the 2019 edition);
- Added cobalt content requirements based on usage scenarios (see 5.4.3);
- Added welding joint coefficients corresponding to different welding methods and non-destructive testing ratios (see 6.2.2). Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document is proposed and coordinated by the National Nuclear Energy Standardization Technical Committee (SAC/TC58). This document was drafted by: China Nuclear Power Engineering Co., Ltd., Shanghai Nuclear Engineering Research and Design Institute Co., Ltd., China Nuclear Power Research Institute Design Institute, China General Nuclear Power Engineering Co., Ltd., Nuclear and Radiation Safety Center of the Ministry of Ecology and Environment, China Machinery Productivity Promotion Center, Nuclear Industry Standardization Research Institute Research Institute. The main drafters of this document are: Zuo Shuchun, Zhu Jingmei, Jin Wenjuan, Meng Xianggai, Miao Ling, Zhou Quan, Zhang Yaochun, Yang Chuansheng, Dong An, Zhang Feng, Liu Jiayi, Gong Zhao, Sun Jiali, Gao Wenjia, Wang Chao, Fan Zhang, Sheng Feng, Wang Zhenfeng, You Yan, Gao Yongjian, Gu Chunhui, Ni Yiyu, Song Yu, Tian Yajing, Fu Xiaolong, Lin Yishan, Feng Juanjuan, Sun Yiyun, Sheng Chaoyang, Gao Chen, Su Xihui, Li Yingke, Wu Feifei, Li Kang. The previous versions of this document and the documents it replaces are as follows:

---First published in 1996 as GB/T 16702-1996, first revised in 2019;

GB/T 16702 "Design Specification for Mechanical Equipment of Nuclear Island of Pressurized Water Reactor Nuclear Power Plant" is a general technical specification for the design of mechanical equipment of nuclear island of pressurized water reactor nuclear power plant. The standard is to implement the spirit of my country's nuclear safety regulations, actively promote the unification of the standard technical route of mechanical equipment of the nuclear island of pressurized water reactor nuclear power plants, and promote the development of pressurized water reactors. GB/T 16702 is an important part of the relevant standards for the independent design and localization of nuclear island mechanical equipment. The basic and universal standards for design activities of mechanical equipment in the nuclear island of a pressurized water reactor nuclear power