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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 17005-2019

Replacing GB/T 17005-1997

General requirements for impressed current cathodic protection system of coastal structures

滨海设施外加电流阴极保护系统通用要求

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Table of Contents

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard replaces GB/T 17005-1997 "Additive current cathodic protection system for coastal facilities". This standard and GB/T 17005- Compared with.1997, the main technical changes are as follows:

--- The standard scope of application has increased the drum rotary filter for nuclear power plants (see Chapter 1).

--- Revised the protective potential range of carbon steel (see 3.1,.1997 edition 3.1); increased the protection potential of stainless steel, copper and copper alloy Range (see 3.2~3.4).

--- Revised the composition of the cathodic protection system (see 4.1, Chapter 4 of the.1997 edition); supplemented the power supply mode of the power supply (See 4.2); Added titanium-based metal oxide anodes and their performance parameters, and moved the anode type and performance into Chapter 4 (See Table 1 in 4.3.1, Table 2 in Table

5.2.1 of.1997); modified design parameters for different reference electrodes, reference electrode class Type and main performance related content moved into Chapter 4 (see Table 2 in 4.4.1, Table 4 in.1997 5.4); added shaft grounding Set the potential difference between the protected body and the protected body (see 4.7.3).

--- Increased general provisions for the design of cathodic protection systems (see 5.1); increased protection current density of drum-shaped rotary screens (see 5.4) Table 3); increased design margin for power supply output current (see 5.5.1); increased number of auxiliary anodes for drum rotary screen Quantity (see 5.6.2.6); increased design requirements for the selection, number and mounting position of the reference electrode (see 5.7.2, 5.7.3); Thickness of the anode shield (see 5.8).

--- Revised Chapter 6 title (see Chapter 6, Chapter 6 of the.1997 edition); added power supply installation requirements (see 6.1); The relevant contents of the installation of the auxiliary anode, the reference electrode, the anode shielding layer and the shaft grounding device are moved into Chapter 6 (see 6.2, 6.3, 6.4, 6.5, 4.3, 4.4, 4.5, 4.6) of the.1997 edition; increased the arrangement and installation structure of the auxiliary anode of the drum-shaped rotary screen (see 6.2.8); The installation structure of the reference electrode of the drum rotary filter is added (see 6.3.6); the installation structure of the shaft grounding device is added (see Appendix) D); Removed the requirements for the manufacturer in the acceptance rules (see

6.1 of the.1997 edition).

--- Merged Chapters 7 and 8 of the original standard (see Chapter 7, Chapter 7, Chapter 8 of the.1997 edition); modified the potential to be satisfied Technical requirements (see

7.3.1.1, 7.3.1.2,.1997 editions 8.1.1, 8.1.2); increased requirements for cathodic protection potential measurement (see 7.3.1.3); modified corrosion weight loss test (see 7.3.2,.1997 edition 8.2); revised test piece weighing accuracy and protection meter Calculate the formula (see 7.3.2,

8.2 of the.1997 edition). This standard is proposed and managed by the National Marine Ship Standardization Technical Committee (SAC/TC12). This standard was drafted. China Shipbuilding Industry Corporation 725th Research Institute, Qingdao Shuangrui Marine Environmental Engineering Co., Ltd., China Power Engineering Consulting Group East China Power Design Institute Co., Ltd., China Nuclear Power Engineering Co., Ltd., Jiangsu Nuclear Power Co., Ltd., China Power Power Engineering Consulting Group North China Electric Power Design Institute Co., Ltd., China Power Engineering Consulting Group Northeast Electric Power Design Institute Co., Ltd., China Energy Construction Group Shenyang Electric Power Machinery General Factory Co., Ltd., China Energy Construction Group Guangdong Electric Power Design and Research Institute Co., Ltd., China Power Engineering Advisory Group Southwest Electric Power Design Institute Co., Ltd. The main drafters of this standard. Wang Tingyong, Wang Hui, Zhao Chao, Wang Xiangchen, Xu Likun, Wang Mingren, Bai Wei, Zhang Yungan, Zeng Xiaochao, Wang Weimin, Fu Bin, Mao Weibing, Liao Nei Ping. The previous versions of the standards replaced by this standard are.

---GB/T 17005-1997. Coastal facility with current cathode General requirements for protection systems

1 Scope

GB/T 17005-2019 is the Chinese national standard on general requirements for impressed current cathodic protection system of coastal structures, in the field of shipbuilding and marine structures. 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 4 June 2019 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 January 2020. Classification: ICS 47.020.99, CCS A29. 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 standard specifies the protection potential criteria for the current cathodic protection system in the coastal facility, the technical requirements of the system, system design, and installation. Requirements for inspection, operation, maintenance and testing. This standard is applicable to the impressed current of seawater pipelines, seawater pumps, drum rotary filters, condensers, floating docks and other coastal facilities in seawater. Cathodic

protection. Impressed current cathodic protection for other devices in seawater and for circulating fresh water, high brine containing water systems and underwater facilities Can also refer to use.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 3108 ship external current cathodic protection system

GB/T 7387 Marine reference electrode technical conditions

GB/T 7388 marine auxiliary anode technical conditions

GB/T 7788 General technical conditions for anode screen coatings for ships and marine engineering CB*3220 marine potentiostat technical conditions

3 Protection potential criterion

3.1 A facility or system consisting of carbon steel or carbon steel and various materials such as stainless steel, cast iron, and copper alloy to protect electricity in an aerobic environment. The position should be -0.80V~-1.05V (relative to the silver/silver chloride reference electrode, the same below); the lack of sulfate-reducing bacteria and sulfides In the oxygen environment, the protection potential should reach -0.90V~-1.05V; for steel grades with a yield strength of not less than 550MPa, cathodic protection should be applied. The most negative potential of the time should not cause hydrogen embrittlement.

3.2 Equipment, components and piping made of stainless steel, the cathodic protection potential criteria are as follows:

a) When the austenitic stainless steel pitting resistance equivalent is not less than 40, the protection potential should reach -0.30V~-1.05V;

b) When the austenitic stainless steel pitting resistance equivalent is less than 40, the protection potential should reach -0.50V~-1.05V;

c) For corrosion resistant alloy steels such as duplex stainless steel or martensitic stainless steel, the upper limit of the protection potential is -0.50V. If the strength of the material, Factors such as metallurgical conditions and stress state have the risk of hydrogen embrittlement and hydrogen-induced stress cracking of the protected body, then the protective potential The limit should not be reduced to -0.80V.

Note. The pitting resistance equivalent PREN is a value calculated based on the mass fraction of certain elements in the metal. Generally, the higher the PREN value, the higher the pitting resistance. Well, PREN = Cr% 3.3 x (Mo 0.5W) % 16 x N%.