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

GB/T 33791-2025

Replacing GB/T 33791-2017

**Technical specification for the cathodic protection of steel well
casings**

钢质井套管阴极保护技术规范

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Foreword

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. This document supersedes GB/T 33791-2017 "Technical Specification for Cathodic Protection Corrosion Resistance Operation of Steel Well Casing" and is consistent with GB/T 33791-2017. In comparison, aside from structural adjustments and editorial changes, the main technical changes are as follows:

- a) The scope has been changed (see Chapter 1, Chapter 1 of the.2017 edition);
- b) The definition of the term "steel well casing" has been changed (see 3.1.,2017 edition), and the terms cathodic protection, anode, and cathode protection have been removed. Electrode, electrical insulation, sacrificial anode, impressed current, polarization, reference electrode and definitions (see 3.5, 3.6, 3.8, 3.9 in the.2017 edition). 3.10, 3.11, 3.15, 3.16);
- c) The corrosion environment assessment has been revised (see Chapter 4, Chapter 4 of the.2017 edition);
- d) The section on "Determining the Necessity of Cathodic Protection" has been deleted (see Chapter 5 of the.2017 edition);
- e) Added cathodic protection criteria (see Chapter 5);
- f) The design of the cathodic protection system was changed (see Chapter 6, Chapter 7 in the.2017 edition);

g) The general provisions for the installation of cathodic protection systems have been deleted (see

8.1 in the.2017 edition);

h) The installation of the cathodic protection system was modified (see Chapter 7, Chapter 8 in the.2017 edition);

i) The control of stray current has been changed (see Chapter 8, Chapter 9 in the.2017 edition). 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 by the China Petroleum and Chemical Industry Federation. This document is under the jurisdiction of the National Technical Committee on Corrosion Control Standardization (SAC/TC381). This document was drafted by: China Nuclear Power Operation Management Co., Ltd., Xiamen Zhuoyi Construction Engineering Co., Ltd., and Qingdao Shuangrui Marine Environmental Engineering Co., Ltd. Cheng Co., Ltd., Shenyang Zhongke Environmental Engineering Technology Development Co., Ltd., China Railway Seventh Bureau Group Xi'an Railway Engineering Co., Ltd., Zhejiang Yu Xixi Corrosion Control Co., Ltd., Zhonghe Special Inspection Technology Service Co., Ltd., China Corrosion Control Technology Association, Hebei Provincial Natural Gas Co., Ltd. Ren Company, Changyuan Changtong New Materials Co., Ltd., Shenzhen Zhigao Boshi Engineering Co., Ltd., Beijing University of Science and Technology, Beijing Yalit Technology Development Co., Ltd. Fa Co., Ltd., Shandong Shanghe New Material Technology Co., Ltd., and China Corrosion International Corrosion Control Engineering Technology Research Institute (Beijing) Co., Ltd. The main drafters of this document are. Zhang Wei, Lin Jinding, Zhao Yongtao, Chen Bo, Huang Yi, Wu Fangyun, Liu Xiaopeng, Ren Peng, Dong Chaofang, Wan Li, and Fei Zhisong. Yang Zhimin, Li Weili, Zhan Lining, Yang Feicheng, Li Xia, Liu Zihao, Qi Jiahua, Hu Weibing, Guo Liujie, Li Qiuda, Hu Minglei, Sun Guotao, Zhou Cheng Ma Xinyue, Dong Weirong, Wang Zheng, Zhang Ran, Hou Peng, Li Juan, Yi Du, Luo Hui, Kang Sijia, Jia Qingan, Zhang Yongjiang, Tian Juan. This document was first published in.2017, and this is its first revision. Technical Specifications for Cathodic Protection of Steel Well Casing

1 Scope

GB/T 33791-2025 is the Chinese national standard covering protecting a well casing from the outside - the deep anode bed, the current distribution down a casing that may be kilometres long, the interference with neighbouring wells and pipelines, and the monitoring of a structure nobody can inspect. It replaces GB/T 33791-2017. It was issued on 2 December 2025 and has been in force since 1 July 2026, replacing GB/T 33791-2017. The document is under the responsibility of the China Petroleum and Chemical Industry Federation. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it

contains are those of the document itself, delivered in full with the English translation.

This document specifies the corrosion environment assessment, cathodic protection criteria, cathodic protection system design, installation, and stray electricity management for the outer surface of steel well casings. Records of flow control, cathodic protection system operation and maintenance, and corrosion control. This document applies to the design and installation of cathodic protection systems for the outer surface of steel well casings.

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 21447 Standard for External Corrosion Control of Steel Pipelines

GB/T 21448-2017 Technical Specification for Cathodic Protection of Buried Steel Pipelines

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 steel well casing A hollow cylindrical tube made of steel that is inserted into a pre-drilled well from the ground surface.

3.2 coupling A cylindrical body used to connect two threaded pipes and having internal threads.

3.3 Natural potential The potential of the metallic structure in the electrolyte relative to the reference electrode before applying cathodic protection.

3.4 groundbed One or more sacrificial anodes or forced current-assisted anode systems installed under the ground surface to provide cathodic protection.

3.5 Negative return at the confluence point The connection point between the cathode cable and the protected structure.

Note. The protection current flows back to the power source through this point.

3.6 deep groundbed One or more anodes are installed vertically at a depth of 15m or more below the ground surface to provide cathodic protection.

3.7 A graph showing the change in voltage drop (IR) relative to the depth of the well casing.