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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

中华人民共和国国家标准

GB/T 19285-2014

Replace GB/T 19285-2003

Inspection of corrosion protection for buried steel pipelines

埋地钢质管道腐蚀防护工程检验

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Standardization Administration of the People's Republic of China

Contents

Foreword

This standard was drafted according to rules given by GB/T 1.1 2009.

This standard has replaced GB/T 19825-2003 and the major technical changes in this part are the following compared with GB/T 19825-2003:

-Added inspection and evaluation method of soil corrosion of buried steel pipelines;

-Added inspection without excavation and evaluation method of outer anticorrosive coating condition and damage point;

-Added inspection method without excavation of cathodic protection effect;

-Added comprehensive evaluation method of corrosion protection system;

-Added fuzzy comprehensive evaluation algorithm instance of corrosion protection system for buried steel pipeline (see Annex N)

This standard is proposed by and under the jurisdiction of the China Standardization Committee on Boilers and Pressure Vessels (SAC／TC 262).

Drafting units of this standard: China Special Equipment Inspection Institute, Safety Monitoring Bureau on Special Equipment of General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, Seventh twenty-five Institute of CSIC, Beijing University of Technology, Institute of Safety and Environmental Protection and Technical Supervision of China Southwest Oil & Gasfield, China Petroleum Engineering Southwest Company，Beijing University of Science and Technology，Shanghai Bureau of Quality and Technical Supervision，Sinopec Zhenhai Refining & Chemical Company，Shenzhen gas group Co., Ltd，Shanghai Institute of Special Equipment Inspection, Chinese petroleum Daqing special equipment inspection center，The No.1 Oil Transportation of PetroChina Changqing Oilfield.

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Previous versions that this standard replaces are as follows:

Inspection of corrosion protection for buried pipelines

1 Scope

This standard specifies the inspection and detection content of the quality and effect of corrosion protection for buried steel pipeline and gives the inspection and evaluation methods.

This standard applies to inspect and evaluate the construction and acceptance process of corrosion protection for buried steel pipelines and that of the using of corrosion protection system.

2 Normative references

The articles contained in the following documents have become this document when they are quoted herein. For the dated documents so quoted, all the modifications (Including all corrections) or revisions made thereafter shall be applicable to this document.

GB/T 21447 Specification for external corrosion control for steel pipeline

GB/T 21448 Specification of cathodic protection for underground steel pipelines

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1.1

Soil resistivity

The average value of the resistance per unit length of soil is the index to express the soil conductive and the unit is Ω·m.

3.1.2

Potential of pipeline to soil

It refers to the potential difference between conduit and adjacent electrolyte (soil).

Note: The engineering staff generally names “the potential of pipeline to soil protected by cathode” as “protection potential”

3.1.3

Electrode potential

The voltage measured in external circuit between the electrode and reference electrode that they connect with same electrolyte.

3.1.4

Corrosion potential

It refers to the electrode potential of metal in the given corrosion system.

Note: the term is available regardless of whether there is a net current (external) flowing in or flowing out from the research metal surface.

3.1.5

Free corrosion potential

It refers to corrosion potential without net current (external) flowing in r flowing out from the research metal surface.

3.1.6

Redox potential

It refers to the potential set in the equilibrium between the oxidation state and the reduced state when putting the insert electrode in the moist soil containing oxidizing or reducing agents.

3.1.7

Coating

It refers to the protective layer overlying the metal surface to do the effective separation between metal structures and electrolyte (soil) to achieve the purpose of inhibiting corrosion.

3.1.8

Cathodic protection

It refers to the technology of controlling the electrochemical corrosion through cathodic polarization and the cathode protects the sacrificial anode method and forced current method.

3.1.9

Sacrificial anode

Provide cathodic protection by increasing the self-corrosion speed for metal or alloy.

3.1.10

Impressed current

It also known as the applied current and it applies cathodic protection current through external power supply.

3.1.11

Backfill

It refers to conductive material packed around the anode to improve the working condition of buried anode.

3.1.12

Reference electrode

It refers to the potential with stable and reproducible electrode in moist soil, which is used to as a reference in measuring other electrode potential value.

3.1.13

Impressed current anode

It refers to the electrode, which is connected with the anode of forced-current power and is limited to be conductive.

3.1.14

Test station

It refers to the device led from buried pipelines to protecting parameters used for testing the cathode.

3.1.15

Test pieces

It refers to the test specimen in corrosion test.

3.1.16

IR drop

It refers to the voltage drop produced by the electrolyte between reference electrode and metal pipes due to the flow of current according to the Ohm's law.

3.1.17

Polarized potential

The polarization refers to the interface electrode offset of electrode/electrolyte caused by

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