INTERNATIONAL STANDARD

ISO 23221

First edition
2020-11

Pipeline corrosion control engineering life cycle — General requirements

Ingénierie du contrôle de la corrosion des conduites au cours du cycle de vie — Exigences générales

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ISO 23221:2020
https://standards.iteh.ai/catalog/standards/iso/8a86fa1f-8321-4c09-9c72-e052c3d69881/iso-23221-2020

Reference number
ISO 23221:2020(E)

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Published in Switzerland

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This document was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys,* Subcommittee SC 1, *Corrosion control engineering life cycle*.

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Pipeline corrosion control engineering life cycle — General requirements

1 Scope

This document specifies the general requirements for control elements in the life cycle of pipeline corrosion control engineering.

This document is applicable to all types of pipeline corrosion control engineering programmes.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

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3.1
pipeline corrosion testing and monitoring system
online technology for the real-time testing and feedback of corrosion conditions on both external and internal pipelines

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3.2
temporary decommissioning
suspended operation of a system due to emergencies (such as natural disasters, corrosion leakage, etc.)

Note 1 to entry: The decommissioning system will continue to operate after the emergency measures are taken.

3.3
permanent decommissioning
permanent shutdown of a system

Note 1 to entry: The system has been assessed to have significant technical and economic risks via rigorous procedures and will no longer continue to operate.

4 General principles

4.1 This document summarizes all the aspects of the pipeline corrosion control engineering life cycle to provide general requirements for selecting technical and management standards. This document does not provide specific techniques and management procedures for pipeline corrosion control.

4.2 A traceable and supportive management system shall be established to achieve full control and sustainable improvement on all aspects of the pipeline corrosion control engineering life cycle.

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5 Objectives

5.1 To optimize and coordinate all aspects of the pipeline corrosion control engineering life cycle, the life cycle of pipeline corrosion control engineering shall be suitable for the full life cycle of the protected pipeline.

5.2 The objectives of corrosion control engineering shall be communicated, implemented and maintained at all stages of the pipeline life cycle. The objectives shall be regularly reviewed and improved to ensure their suitability.

6 Corrosion sources

6.1 Corrosion sources include:

a) internal corrosion sources, including, but not limited to, pipeline transmission medium, flow rate, temperature and pressure;

b) external corrosion sources, including, but not limited to, environmental factors and corrosive medium that potentially reacts with pipes under different environmental conditions;

c) new corrosion sources during pipeline operation, including, but not limited to, cathodic disbondment and pipeline maintenance-related and replacement-related electrochemical corrosion;

d) corrosion sources caused by working conditions changes, including working conditions changes in both pipeline and pipeline corrosion control facilities.

EXAMPLE Cathodic disbondment caused by a current overload of cathodic protection.

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6.2 By referring to the implementation cases and relevant standards, all corrosion sources shall be accurately identified according to the life cycle requirements of the pipeline system.

NOTE 1 For corrosion sources of pipelines in atmospheres, refer to ISO 9223.

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NOTE 2 For corrosion sources of buried pipelines, refer to EN 12501-1.

7 Pipeline materials

7.1 The selection of a pipeline shall be based on the corresponding standards.

NOTE For the selection of a pipeline in petroleum and natural gas industries, refer to ISO 13623.

7.2 The following pipeline selection principles shall be fulfilled.

a) The selected pipeline and its applied environment shall be investigated to ensure corrosion resistance as well as environmental protection.

b) Once the application requirements are satisfied, the processability, versatility and cost-effectiveness of the pipeline shall also be considered.

7.3 The pipeline shall be selected using the following procedures.

a) A field investigation on the pipeline working environment shall be carried out to determine corrosion sources, corrosion factors and corrosion magnitude.

b) With reference to corresponding standards and manuals, an appropriate pipeline that meets the corrosion resistance requirements shall be selected.

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