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Petroleum and natural gas industries — Pipeline transportation systems — Design, construction and maintenance of steel cased pipelines

Industries du pétrole et du gaz naturel — Systèmes de transport par conduites — Conception, construction et maintenance de conduites en fourreau en acier

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 2, *Pipeline transportation systems*.

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Introduction

Users of this document are advised that further or differing requirements might be needed for individual applications. This document is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment, or engineering solutions for the individual application. This might be particularly applicable where there is innovative or developing technology. Where an alternative is offered, it is advisable that the vendor identify any variations from this document and provide details.

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Petroleum and natural gas industries — Pipeline transportation systems — Design, construction and maintenance of steel cased pipelines

1 Scope

This document specifies requirements, including corrosion protection, for the design, fabrication, installation and maintenance of steel-cased pipelines for pipeline transportation systems in the petroleum and natural gas industries in accordance with ISO 13623.

NOTE 1 Steel casings can be used for mechanical protection of pipelines at crossings, such as at roads and railways and the installation of a casing at a highway, railway, or other crossing can be required by the permitting agency or pipeline operator.

NOTE 2 This document does not imply that utilization of casings is mandatory or necessary.

NOTE 3 This document does not imply that cased crossings, whether electrically isolated or electrically shorted, contribute to corrosion of a carrier pipe within a cased crossing. However, cased crossings can adversely affect the integrity of the carrier pipe by shielding cathodic protection (CP) current to the carrier pipe or reducing the CP effectiveness on the carrier pipe in the vicinity of the casing. Their use is not recommended unless required by load considerations, unstable soil conditions, or when their use is dictated by sound engineering practices.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15589-1, *Petroleum, petrochemical and natural gas industries — Cathodic protection of pipeline systems — Part 1: On-land pipelines*

EN 12954, *Cathodic protection of buried or immersed metallic structures — General principles and application for pipelines*

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:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
carrier pipe
pipe that conveys the fluid

Note 1 to entry: Note to entry: This applies to both transmission and distribution piping.

3.2
casing
steel pipe installed around a carrier pipe for mechanical protection

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3.3
electrolyte
medium in which electric current is transported by ions

3.4
electrolytic contact
ionic contact between the carrier pipe and the casing pipe through an electrolyte

3.5
end seal
device installed over or within the end of a casing to keep water, deleterious materials and debris out of the casing or provide a water tight seal between the casing and the carrier pipe

3.6
holiday
unintentional discontinuity in a protective coating that exposes the bare steel surface to the environment

3.7
isolator
spacer
dielectric device designed to electrically isolate a carrier pipe from a casing and provide support for the carrier pipe

3.8
metallic short
unintentional contact between two metallic structures

3.9
P/S potential
pipe-to-electrolyte potential
structure-to-electrolyte potential
potential difference between the surface of a buried or submerged metallic structure (pipe or casing) and the electrolyte that is measured with respect to a reference electrode in contact with the electrolyte

3.10
split sleeve
casing installed in situ by welding two halves of the casing together around the carrier pipe

3.11
tunnel liner plate
steel plate used when micro tunnelling, used to shore horizontal excavations in soft ground

3.12
C/S potential
casing–to–electrolyte potential
potential difference between the surface of a buried or submerged metallic casing and the electrolyte that is measured with respect to a reference electrode in contact with the electrolyte

4 Design

4.1 General

The purpose of a casing is to provide additional mechanical protection to the carrier pipe. A casing can also be required by a permitting authority to allow replacement of a carrier pipe without excavations at the location of a crossing.

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