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Petroleum and natural gas industries - Arctic operations - Material requirements for arctic operations (ISO/TS 35105:2018)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/20

Táto predbežná STN je určená na overenie. Pripomienky zasielajte ÚNMS SR najneskôr do septembra 2021.

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ICS 75.020

English Version

Petroleum and natural gas industries - Arctic operations - Material requirements for arctic operations (ISO/TS 35105:2018)

Industries du pétrole et du gaz naturel - Opérations en Arctique - Exigences applicables aux matériaux pour les opérations en Arctique (ISO/TS 35105:2018)

Erdöl- und Erdgasindustrie - Arktisbetrieb - Werkstoffanforderungen für den Arktisbetrieb (ISO/TS 35105:2018)

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents

Page

European foreword

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The text of ISO/TS 35105:2018 has been approved by CEN as CEN ISO/TS 35105:2019 without any modification.

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Petroleum and natural gas industries — Arctic operations — Material requirements for arctic operations

Industries du pétrole et du gaz naturel — Opérations en Arctique — Exigences relatives au matériel requis pour les opérations en Arctique

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Contents

Page

Foreword

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This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 8, *Arctic operations*.

Introduction

Operations in an Arctic environment are characterized by low ambient temperatures, the presence of sea ice and ice bergs and icing of structures and components. In many cases they are also associated with remote locations relative to infrastructure and logistics. Maintenance operations are therefore expensive and accidents leading to emissions can have severe environmental consequences.

Structural failure is in most cases failure of materials and caused by well-known degradation mechanisms such as fatigue and corrosion. Under Arctic conditions, failure due to possible brittle materials behaviour needs to be given special consideration.

This document was developed to bridge the gap between the functional requirements to offshore structures in Arctic environments given in design standards and the material requirements given in material and fabrication specifications where Arctic operating conditions have not been considered in sufficient detail.

Petroleum and natural gas industries — Arctic operations — Material requirements for arctic operations

1 Scope

This document provides recommendations for material selection, manufacturing and fabrication requirements, testing and qualification of steel structures and components for offshore and onshore petroleum and natural gas facilities operating in Arctic and cold environments.

This document is intended to be used as a supplement to existing standards for steel structures where the particular operating conditions in Arctic regions are not sufficiently addressed.

This document gives particular requirements to ensure safe operation with respect to the risk of brittle fracture at low temperatures. These requirements will affect the selection of material grade and design class as well as the technical delivery conditions for steel. They will also affect the fabrication requirements as well as testing and qualification requirements.

This document also gives recommendations:

— to mitigate the operational and integrity aspects related to snow and ice accretion on topside structures;

— to take into account the particular Arctic operating conditions in corrosion assessments and requirements for corrosion protection systems;

— for particular operational requirements to ensure safe operation in Arctic regions.

The requirements in this document are applicable to any operating temperatures, but particular requirements related to de-rating (loss of strength) at high temperatures are not addressed. Limitations to the applicable minimum design temperature caused by the capability of the materials' low temperature performance can exist, but are not a limitation for the scope of this document.

As a practical guideline for the use of this document, low temperature is defined as lowest anticipated service temperature (LAST) below –10 °C.

NOTE For determination of LAST, see 6.3.2.

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 19900, *Petroleum and natural gas industries — General requirements for offshore structures*

ISO 19901-1, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 1: Metocean design and operating considerations*

ISO 19901-2, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 2: Seismic design procedures and criteria*

ISO 19901-4, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 4: Geotechnical and foundation design considerations*

ISO 19902:2007, *Petroleum and natural gas industries — Fixed steel offshore structures*

ISO 19906, *Petroleum and natural gas industries — Arctic offshore structures*

EN 10225:2009, *Weldable structural steels for fixed offshore structures — Technical delivery conditions*

API RP 2Z, *Preproduction Qualification for Steel Plates for Offshore Structures*