SLOVENSKI STANDARD
oSIST prEN ISO 16904:2013

01-junij-2013

Industrija nafte in zemeljskega plina - Načrtovanje in preskušanje rok za pretakanje utekočinjenega zemeljskega plina za konvencionalne terminale na kopnem (ISO/DIS 16904:2013)

Petroleum and natural gas industries - Design and testing of LNG marine transfer arms for conventional onshore terminals (ISO/DIS 16904:2013)

Erdöl- und Erdgasindustrie - Auslegung und Prüfung von Schiffsverladearmen für Flüssigerdgas für konventionelle landseitige Terminals (ISO/DIS 16904:2013)

Industries du pétrole et du gaz naturel - Conception et essai de bras de transfert de gaz naturel liquéfié sur des terminaux terrestres conventionnels (ISO/DIS 16904:2013)

Ta slovenski standard je istoveten z: prEN ISO 16904

ICS:

75.180.01	Oprema za industrijo nafte in zemeljskega plina na splošno	Equipment for petroleum and natural gas industries in general
75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment

oSIST prEN ISO 16904:2013 en,de

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN ISO 16904

March 2013

ICS 75.180.01

Will supersede EN 1474-1:2008

English Version

Petroleum and natural gas industries - Design and testing of LNG marine transfer arms for conventional onshore terminals (ISO/DIS 16904:2013)

Industries du pétrole et du gaz naturel - Conception et essai de bras de transfert de gaz naturel liquéfié sur des terminaux terrestres conventionnels (ISO/DIS 16904:2013)

Erdöl- und Erdgasindustrie - Auslegung und Prüfung von Schiffsverladearmen für Flüssigerdgas für konventionelle landseitige Terminals (ISO/DIS 16904:2013)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 282.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN ISO 16904:2013: E

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Foreword

This document (prEN ISO 16904:2013) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with Technical Committee CEN/TC 282 “Installation and equipment for LNG” the secretariat of which is held by AFNOR.

This document is currently submitted to the parallel Enquiry.

This document will supersede EN ISO 1474-1:2008.

Endorsement notice

The text of ISO/DIS 16904:2013 has been approved by CEN as prEN ISO 16904:2013 without any modification.

DRAFT INTERNATIONAL STANDARD ISO/DIS 16904

ISO/TC **67** Secretariat: **NEN**

Voting begins on **2013-03-14** Voting terminates on **2013-08-14**

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Petroleum and natural gas industries — Design and testing of LNG marine transfer arms for conventional onshore terminals

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ICS 75.180.01

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as r eceived from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16904 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

Petroleum and natural gas industries — Design and testing of LNG marine transfer arms for conventional onshore terminals

1 Scope

This International Standard specifies the design, minimum safety requirements and inspection and testing procedures for liquefied natural gas (LNG) marine transfer arms intended for use on conventional onshore LNG terminals, handling LNG carriers engaged in international trade. It can provide guidance for offshore and coastal operations. It also covers the minimum requirements for safe LNG transfer between ship and shore.

Although the requirements for power/control systems are covered, this International Standard does not include all the details for the design and fabrication of standard parts and fittings associated with transfer arms.

This International Standard is supplementary to local or national standards and regulations and is additional to the requirements of ISO 28460.

This International Standard needs not be applied to existing facilities.

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60034-5, *Rotating electrical machines — Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) — Classification*

IEC 60079-0, *Explosive atmospheres — Part 0: General requirements*

IEC 60079-1, *Explosive atmospheres — Part 1: Equipment protection by flameproof enclosures “d”*

IEC 60079-2, *Explosive atmospheres — Part 2: Equipment protection by pressurized enclosures “p”*

IEC 60079-5, *Explosive atmospheres — Part 5: Equipment protection by powder filling “q”*

IEC 60079-6, *Explosive atmospheres — Part 6: Equipment protection by oil immersion “o”*

IEC 60079-7, *Explosive atmospheres — Part 7: Equipment protection by increased safety “e”*

IEC 60079-10-1, *Explosive atmospheres — Part 10-1: Classification of areas – Explosive gas atmospheres*

IEC 60079-11, *Explosive atmospheres — Part 11: Equipment protection by intrinsically safety “i”*

IEC 60079-18, *Electrical atmospheres — Part 18: Equipment protection by encapsulation “m”*

IEC 60079-25, *Electrical atmospheres — Part 25: Intrinsically safe electrical systems*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)* and IEC 60529/A1, *Amendment 1*

IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

IEC 62305-3, *Protection against lightning — Part 3: Physical damage to structures and life hazard*

ISO 3452-1, *Non-destructive testing — Penetrant testing — Part1: General principles*

ISO 4406, *Hydraulic fluid power – Fluids — Method for coding the level of contamination by solid particles*

ISO 9000, *Quality management systems — Fundamentals and vocabulary*

ISO 9001, *Quality management systems — Requirements*

ISO 9934-1, *Non-destructive testing — Magnetic particle testing – Part1: General principles*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 10497, *Testing of valves — Fire type-testing requirements*

ISO 17636, *Non-destructive testing of welds — Radiographic testing of fusion-welded joints*

ISO 28460, *Installation and equipment for liquefied natural gas - Ship to shore interface and port operations*

ASME B16.5, *Pipe Flanges and Flanged Fittings*

ASME Boiler and Pressure Vessel Code IX: *Welding and Brazing Qualifications*

3 Terms and definitions and abbreviations

3.1 Terms and definitions

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

3.1
apex swivel
articulated, fluid-carrying joint located between the <inboard arm> and <outboard arm>

Note 1 to entry: See Figure B.2.

Note 2 to entry: It provides <luffing> of the <outboard arm> relative to the <inboard arm>.

3.2
attitude
various modes of use and/or location of the <transfer arm> (i.e. manoeuvring, stowed, connected, hydrostatic test, and maintenance)

Note 1 to entry: The <transfer arm> can take several positions for each <attitude>.

3.3
base riser
riser
vertical assembly which bolts to the loading platform and supports the articulated assembly of the <transfer arm>

Note 1 to entry: See Figure B.2.

Note 2 to entry: Sometimes referred to as ‘standpost’.

3.4
bottom swivel
accommodates pitching motion of <LNG carrier> and is located adjacent to <presentation flange> in horizontal part of <TSA>

Note 1 to entry: See Figure B.2.

3.5
brinelling
any permanent indentation in <swivel> or <structural bearing> raceways caused by excessive loading of balls or rollers

3.6
cargo manifold
pipe assembly mounted onboard <LNG carrier> to which the <presentation flange> or <QCDC> of the <transfer arm> is connected

Note 1 to entry: See Figure B.2.

3.7
cavitation
formation and collapse of bubbles in a liquid when the pressure falls to or below the liquid vapour pressure; the collapse releases energy, sometimes with an audible sound and vibration

Note 1 to entry: Such low pressures occur in high velocity zones such as the inner radius of elbows, or at places with variations of diameters.

3.8
clash
any contact during design operational conditions, or as a result of an emergency separation, between any part of a <transfer arm> and:

— adjacent <transfer arm> while both <arm>s are operating or one <arm> is operating and the other <arm> is stowed (e.g. the counterweights);

— adjacent section of the same <transfer arm> (e.g. <triple swivel assembly> and <outboard arm>);

— loading platform equipment (e.g. <counterweight> and piping or valves)

3.9
contact angle α
angle between the plane of the <swivel joint> or <structural bearing> balls or rollers and the centre of contact at the ball or roller raceway interface

3.10
conventional onshore LNG terminal
LNG exporting or receiving terminal that is located on-shore and that has a marine transfer arms for the loading or unloading of LNG carriers in a harbour or other sheltered coastal location

3.11
counterweight
system of weights used to balance the <inboard arm> and <outboard arm> assemblies

Note 1 to entry: Some <transfer arm>s have a single <counterweight> for this function and others have multiple <counterweight>s.

3.12
design pressure
pressure for which the <transfer arm> is designed