



SLOVENSKI STANDARD
kSIST FprEN 14161:2011
01-april-2011

Industrija nafte in zemeljskega plina - Transportni cevovodni sistemi (ISO 13623:2009, spremenjen)

Petroleum and natural gas industries - Pipeline transportation systems (ISO 13623:2009 modified)

Erdöl- und Erdgasindustrie - Rohrleitungstransportsysteme (ISO 13623:2009 modifiziert)

Industries du pétrole et du gaz naturel - Systèmes de transport par conduites (ISO 13623:2009 modifiée)

Ta slovenski standard je istoveten z: FprEN 14161

ICS:

75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment
--------	---	---

kSIST FprEN 14161:2011

en,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

FINAL DRAFT
FprEN 14161

December 2010

ICS 75.200

Will supersede EN 14161:2003

English Version

Petroleum and natural gas industries - Pipeline transportation systems (ISO 13623:2009 modified)

Industries du pétrole et du gaz naturel - Systèmes de transport par conduites (ISO 13623:2009 modifiée)

Erdöl- und Erdgasindustrie - Rohrleitungstransportsysteme (ISO 13623:2009 modifiziert)

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 12.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	5
Introduction	6
1 Scope	7
2 Normative references	9
3 Terms, definitions and symbols.....	11
3.1 Terms and definitions	11
3.2 Symbols	13
4 General.....	14
4.1 Health, safety and the environment.....	14
4.2 Competence assurance	14
4.3 Compliance.....	14
4.4 Records.....	14
5 Pipeline system design	14
5.1 System definition	14
5.2 Categorization of fluids.....	14
5.3 Hydraulic analysis	15
5.4 Pressure control and overpressure protection	15
5.5 Requirements for operation and maintenance.....	15
5.6 Public safety and protection of the environment.....	16
6 Design of pipeline and primary piping	16
6.1 Design principles	16
6.2 Route selection	17
6.3 Loads	19
6.4 Strength requirements	22
6.5 Stability	26
6.6 Pipeline spanning	27
6.7 Pressure test requirements	27
6.8 Other activities.....	28
6.9 Crossings and encroachments	29
6.10 Adverse ground and seabed conditions	31
6.11 Section isolation valves	31
6.12 Integrity monitoring	31
6.13 Design for pigging	31
6.14 Fabricated components	32
6.15 Attachment of supports or anchors.....	33
6.16 Offshore risers	34
7 Design of stations and terminals	35
7.1 Selection of location.....	35
7.2 Layout	35
7.3 Security.....	36
7.4 Safety	36
7.5 Environment.....	36
7.6 Buildings.....	36
7.7 Equipment	36
7.8 Piping	37
7.9 Emergency shutdown system.....	38
7.10 Electrical	38
7.11 Storage and working tankage.....	38

7.12	Heating and cooling stations	38
7.13	Metering and pressure control stations.....	38
7.14	Monitoring and communication systems	39
7.15	Compressor stations for on-land gas supply systems	39
8	Materials and coatings.....	39
8.1	General material requirements for pipelines and primary piping	39
8.2	Line pipe.....	42
8.3	Components other than pipe.....	43
8.4	Coatings	44
9	Corrosion management	45
9.1	General	45
9.2	Internal corrosivity evaluation	46
9.3	Internal corrosion mitigation.....	46
9.4	External corrosion evaluation.....	48
9.5	External corrosion mitigation	49
9.6	Monitoring programmes and methods.....	50
9.7	Evaluation of monitoring and inspection results.....	51
9.8	Corrosion-management documentation	51
10	Construction	52
10.1	General	52
10.2	Preparation of the route on land.....	53
10.3	Preparation of the route offshore	53
10.4	Welding and joining	53
10.5	Coating	54
10.6	Installation of pipelines on land.....	55
10.7	Installation of offshore pipelines	57
10.8	Cleaning and gauging	59
10.9	As-built surveys.....	60
10.10	Construction records	60
11	Testing.....	60
11.1	General	60
11.2	Safety.....	61
11.3	Procedures.....	61
11.4	Acceptance criteria	62
11.5	Tie-ins following testing	62
11.6	Testing equipment.....	63
11.7	Test documentation and records.....	63
11.8	Disposal of test fluids	64
11.9	Protection following test.....	64
12	Pre-commissioning and commissioning	64
12.1	General	64
12.2	Cleaning and gauging procedures	64
12.3	Drying procedures.....	64
12.4	Functional testing of equipment and systems.....	65
12.5	Documentation and records.....	65
12.6	Start-up procedures and introduction of transported fluid	65
13	Operation, maintenance and abandonment	66
13.1	Management.....	66
13.2	Operations.....	69
13.3	Maintenance	70
13.4	Changes to the design condition.....	77
13.5	Life extension	78
13.6	Abandonment	78
Annex A	(normative) Safety evaluation of pipelines	79
A.1	Introduction.....	79
A.2	General requirements	79

FprEN 14161:2010 (E)

A.3	Definition of the scope of the evaluation	79
A.4	Hazard identification and initial evaluation.....	80
A.5	Hazard estimation	81
A.6	Review of results	82
A.7	Documentation.....	82
Annex B	(normative) Supplementary requirements for public safety of pipelines for category D and E fluids on land.....	83
B.1	Objective.....	83
B.2	Location classification	83
B.3	Population density.....	84
B.4	Concentration of people	84
B.5	Maximum hoop stress.....	84
B.6	Pressure test requirements	85
Annex C	(informative) Pipeline route selection process.....	86
C.1	Limits	86
C.2	Constraints	86
C.3	Preferred corridors of interest.....	86
C.4	Detailed routing.....	86
Annex D	(informative) Examples of factors for routing considerations.....	87
Annex E	(informative) Scope of procedures for operation, maintenance and emergencies	89
E.1	Operating procedures	89
E.2	Maintenance procedures	89
E.3	Emergency procedures.....	90
Annex F	(informative) Records and documentation.....	91
	Bibliography.....	92

Foreword

This document (FprEN 14161:2010) has been prepared by Technical Committee CEN/TC 12 “Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries”, the secretariat of which is held by AFNOR.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 14161:2003.

The text of ISO 13623:2009 has been adopted by CEN/TC 12 with some modifications. These modifications are indicated by a vertical line in the left margin of the text.

Where the expression “International Standard” is used, it is understood as “European Standard”.

Introduction

Significant differences exist between member countries in the areas of public safety and protection of the environment, which cannot be reconciled into a single preferred approach to pipeline transportation systems for the petroleum and natural gas industries. Reconciliation was further complicated by the existence in some member countries of legislation that establishes requirements for public safety and protection of the environment. Recognizing these differences, ISO/TC 67/SC 2 concluded that this International Standard should allow individual countries to apply their national requirements for public safety and the protection of the environment.

This International Standard is not a design manual; rather, it is intended for use in conjunction with sound engineering practice and judgment. This International Standard allows the use of innovative techniques and procedures, such as reliability-based limit state design methods, providing the minimum requirements of this International Standard are satisfied.

This second edition cancels and replaces the first edition, (ISO 13623:2000), which has been technically revised. Major revisions include replacement of various references to national standards with references to International Standards; replacement of sections on coatings and cathodic protection with ISO references; revision of design to accommodate line pipe above L555 in the new edition of ISO 3183; and the addition of a section on life extension.

ISO 13623:2009, developed within ISO/TC 67 SC 2, has been adopted as EN 14161:2011 (ISO 13623:2009 modified).

The scope of ISO/TC 67/SC 2 is pipeline transportation systems for the petroleum and natural gas industries without exclusions. However in CEN, the scopes of CEN/TC 12 and CEN/TC 234 overlapped until 1995. This scope overlap caused problems for the parallel procedure for the above-mentioned items. The conflict in scope was resolved when both the CEN/Technical Committees and the CEN/BT took the following resolution:

Resolution BT 38/1995: Subject: Revised scope of CEN/TC 12

"BT endorses the conclusions of the coordination meeting between CEN/TC 12 "Materials, equipment and offshore structures for petroleum and natural gas industries" and CEN/TC 234 "Gas supply" and modifies the CEN/TC 12 scope, to read:

"Standardization of the materials, equipment and offshore structures used in drilling, production, refining and the transport by pipelines of petroleum and natural gas, excluding on-land supply systems used by the gas supply industry and those aspects of offshore structures covered by IMO requirement (ISO/TC 8).

The standardization is to be achieved wherever possible by the adoption of ISO Standards."

In 2009, CEN/TC 12 changed its scope to be in coherency with the last CEN/TC 234's scope changes, as follows (resolution CEN/BTC 19/2009):

Standardisation of the materials, equipment and offshore structures used in the drilling, production, transport by pipelines and processing of liquid and gaseous hydrocarbons within the petroleum, petrochemical and natural gas industries, excluding on-land supply systems used by the gas supply industry excluding gas infrastructure from the input of gas into the on-shore transmission network up to the inlet connection of gas appliances. (covered by CEN/TC234) and those aspects of offshore structures covered by IMO requirements (ISO/TC8).

The standardisation is to be achieved wherever possible by the adoption of ISO standards.

Resulting from these resolutions, "on-land supply systems used by the gas supply industry excluding gas infrastructure from the input of gas into the on-shore transmission network up to the inlet connection of gas appliances" has been excluded from the scope of ISO 13623:2009 for the European adoption by CEN/TC 12.