



**SLOVENSKI STANDARD**  
**oSIST prEN ISO 13628-1:2024**  
**01-februar-2024**

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**Naftna in plinska industrija, vključno z nizkoogljično energijo - Načrtovanje in upravljanje proizvodnje v podmorskih sistemih - 1. del: Splošne zahteve in priporočila (ISO/DIS 13628-1:2023)**

Oil and gas industries including low carbon energy - Design and operation of subsea production systems - Part 1: General requirements and recommendations (ISO/DIS 13628-1:2023)

Öl- und Gasindustrie einschließlich kohlenstoffarmer Energieträger - Auslegung und Betrieb von Unterwasser-Fördersystemen - Teil 1: Allgemeine Anforderungen und Empfehlungen (ISO/DIS 13628-1:2023)

Industries du pétrole et du gaz, y compris les énergies à faible teneur en carbone - Conception et exploitation des systèmes de production immergés - Partie 1: Exigences générales et recommandations (ISO/DIS 13628-1:2023)

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**Ta slovenski standard je istoveten z: prEN ISO 13628-1**

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**ICS:**

75.180.10	Oprema za raziskovanje, vrtanje in odkopavanje	Exploratory, drilling and extraction equipment
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**oSIST prEN ISO 13628-1:2024**

**en,fr,de**



# DRAFT INTERNATIONAL STANDARD

## ISO/DIS 13628-1

ISO/TC 67/SC 4

Secretariat: ANSI

Voting begins on:  
2023-12-06Voting terminates on:  
2024-02-28

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## Oil and gas industries including low carbon energy — Design and operation of subsea production systems —

### Part 1: General requirements and recommendations

ICS: 75.180.10

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CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

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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](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, 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 [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 67, *Oil and gas industries including lower carbon energy*, Subcommittee SC 4, *Drilling, production and injection equipment*.

A list of all parts in the ISO 13628series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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## ISO/DIS 13628-1:2023(E)

### Introduction

This part of ISO 13628 has been prepared to provide general requirements, recommendations and overall guidance for the user to the various areas requiring consideration during development of a subsea production system for the petroleum and natural gas industries. The functional requirements defined in this part of ISO 13628 will allow alternatives in order to suit specific field requirements. The intention is to facilitate and complement the decision process rather than to replace individual engineering judgement and, where requirements are non-mandatory, to provide positive guidance for the selection of an optimum solution.

NOTE Currently only ISO 13628-1 is updated to mirror API RP 17A. The remaining documents in the ISO 13628 series are expected to be updated in the same manner at a later stage.

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# Oil and gas industries including low carbon energy — Design and operation of subsea production systems —

## Part 1: General requirements and recommendations

### 1 Scope

This document provides general requirements and recommendations for the development and operation of subsea production/injection systems, from the concept development phase to decommissioning and abandonment. This document references API 17-series documents, as well as various relevant industry documents.

A complete subsea production/injection system comprises several subsystems necessary to produce hydrocarbons from one or more subsea wells and transfer them to a processing/host facility located offshore (fixed, floating, or subsea) or onshore, or to inject water/gas via subsea facilities and/or wells (as shown in [Figure 1](#)).

NOTE The term “subsea production system” is used generically throughout this document to describe both production and injection systems.

Flexible pipe standards form part of the API 17-series of documents (see [4.3.3](#)); however, this document (technically equivalent to API RP 17A 6<sup>th</sup> edition) does not generally cover flowlines/pipelines or production/injection risers (associated with flowlines/pipelines). These components form part of a complete Subsea Production System (SPS), as shown in [Figure 1](#).

If requirements as stated in this document are in conflict with, or are inconsistent with, requirements as stated in API 17-series documents, the specific requirements in the subsystem series document(s) take precedence.

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### 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 29001:2020, *Petroleum, petrochemical and natural gas industries — Sector-specific quality management systems — Requirements for product and service supply organizations*

API Recommended Practice 17B, *Recommended Practice for Flexible Pipe*

API Specification 17D, *Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment*

API Specification 17E, *Specification for Subsea Umbilicals*

API Standard 17F, *Standard for Subsea Production Control Systems*

API Standard 17G, *Design and Manufacture of Subsea Well Intervention Systems*

API Recommended Practice 17G3, *Design of Subsea Well Intervention Systems Using Non-Ferrous Alloys*

API Recommended Practice 17G5, *Intervention Workover Control Systems (IWOCs)*

API Recommended Practice 17H, *Remotely Operated Tools and Interfaces on Subsea Production Systems*

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API Specification 17J, *Specification for Unbonded Flexible Pipe*

API Specification 17K, *Specification for Bonded Flexible Pipe*

API Specification 17L1, *Specification for Flexible Pipe Ancillary Equipment*

API Recommended Practice 17L2, *Recommended Practice for Flexible Pipe Ancillary Equipment*

API Recommended Practice 17N, *Recommended Practice for Subsea Production System Reliability and Technical Risk Management*

API Standard 17O, *Standard for Subsea High Integrity Pressure Protection Systems (HIPPS)*

API Recommended Practice 17P, *Design and Operation of Subsea Production Systems—Subsea Structures and Manifolds*

API Recommended Practice 17Q, *Recommended Practice on Subsea Equipment Qualification*

API Recommended Practice 17R, *Recommended Practice for Flowline Connectors and Jumpers*

API Recommended Practice 17S, *Recommended Practice for the Design, Testing, and Operation of Subsea Multiphase Flow Meters*

API Recommended Practice 17U, *Recommended Practice for Wet and Dry Thermal Insulation of Subsea Flowlines and Equipment*

API Recommended Practice 17V, *Recommended Practice for Analysis, Design, Installation, and Testing of Safety Systems for Subsea Applications*

API Recommended Practice 17W, *Recommended Practice for Subsea Capping Stacks*

API Recommended Practice 17X, *Recommended Practice for Subsea Pump Module Systems*

API Specification Q1, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*

API Specification Q2, *Specification for Quality Management System Requirements for Service Supply Organizations for the Petroleum and Natural Gas Industries*

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### 3 Terms and definitions, acronyms and abbreviations

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

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

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

#### 3.1 Terms and definitions

##### 3.1.1 barrier

element forming part of a pressure-containing envelope that is designed to prevent unintentional flow of production/injected fluids, particularly to the external environment

##### 3.1.2

##### extended factory acceptance test

##### EFAT

test(s) conducted to verify that the specified requirements, for a set of interfacing products, have been fulfilled, refer to [Annex A](#) for examples

**3.1.3****factory acceptance test****FAT**

test(s) conducted to verify that the specified requirements for a product, have been fulfilled, refer to [Annex A](#) for examples

**3.1.4****high-pressure/high-temperature****HPHT**

any environment above 15,000 psi (103,5 MPa) working pressure and/or operating above 350 °F (177 °C)

**3.1.5****interchangeability test****ICT**

test(s) conducted to verify the interchangeability requirements of “identical” products (including products of like design, with respect to the relevant interface(s)), which may be interfaced with other mating products at the installation site, have been fulfilled, refer to [Annex A](#) for examples

**3.1.6****life cycle**

series of identifiable stages through which an item goes, from its conception to disposal

**3.1.7****pre-deployment test**

test(s) conducted to verify that the specified requirements, for a product that is ready for deployment, are still fulfilled, refer to [Annex A](#) for examples

**3.1.8****site received test****SRT**

test(s) conducted to verify that the specified requirements, for a product that has been transported from one site to another, are still fulfilled, refer to [Annex A](#) for examples

**3.1.9****system function test****SFT**

test(s) conducted to validate that the requirements for a specific intended use or application, of a set of products that form a “complete” functional system, have been fulfilled, refer to [Annex A](#) for examples

**3.1.10****system integration test****SIT**

test(s) conducted to validate that the requirements for a specific intended use or application of a set of products that form an integrated system have been fulfilled, refer to [Annex A](#) for examples

**3.1.11****validation testing**

test(s) conducted to confirm that the requirements for a specific intended use or application of a product have been fulfilled, refer to [Annex A](#) for examples

**3.1.12****verification testing**

test(s) conducted to confirm that the specified requirements for a product have been fulfilled, refer to [Annex A](#) for examples

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### 3.2 Acronyms and abbreviations

BOP	blowout preventer
CRA	corrosion-resistant alloy
C/WO	completion/workover
EFAT	extended factory acceptance test
EFL	electrical flying lead
FAT	factory acceptance test
FMEA	failure modes and effects analysis
FMECA	failure mode, effects, and criticality analysis
HAZOP	hazard and operability study
HFL	hydraulic flying lead
HIPPS	high integrity pressure protection system
HPHT	high-pressure/high-temperature
HPU	hydraulic power unit
HSE	health, safety, and environment
ICT	interchangeability test
IWOCS	installation workover control system
LRFD	load and resistance factored design
MCS	master control station
MODU	mobile offshore drilling unit
MPFM	multiphase flow meter
NORM	naturally occurring radioactive materials
OEM	original equipment manufacturer
OREDA	offshore and onshore reliability data
PDT	pre-deployment test
PLEM	pipeline end manifold
QRA	quantitative risk assessment
RAM	reliability, availability, and maintainability
ROT	remotely operated tool
ROV	remotely operated vehicle
SCM	subsea control module

SFT	system function test
SIT	system integration test
SRT	site received test
SUDU	subsea umbilical distribution unit
SUT	subsea umbilical termination
TCRT	tree cap running tool
THRT	tubing hanger running tool
TRT	tree running tool
USV	underwater safety valve
VIV	vortex induced vibration
WSD	working stress design

## 4 Subsea production system

### 4.1 General

Subsea production systems range in complexity from a single satellite well linked to an offshore or onshore installation to several wells comingled in a subsea manifold producing to a fixed, floating, or onshore facility.

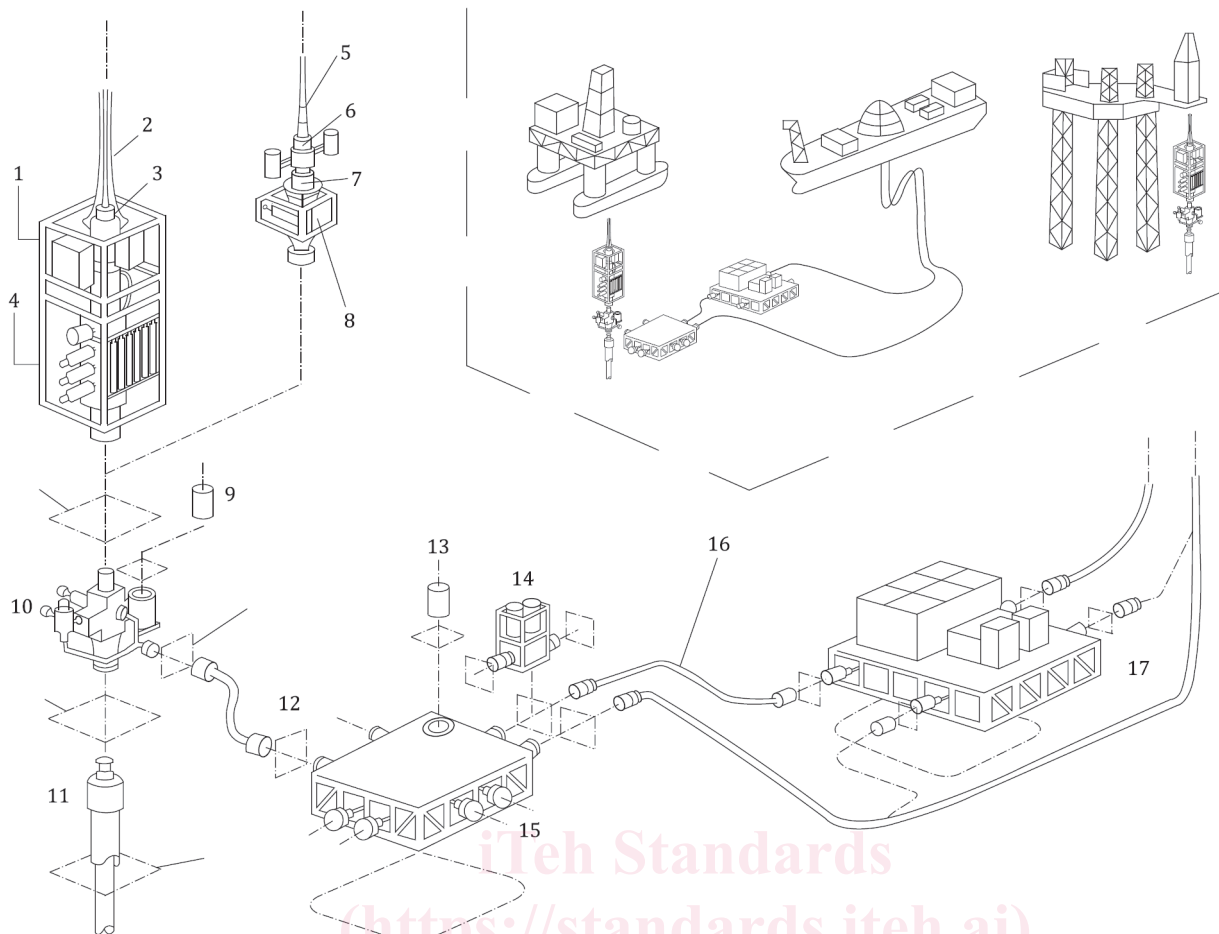
Subsea production systems can be used to produce from shallow-water or deepwater reservoirs. Deepwater conditions can inherently dictate development of a field by means of a subsea production system, since fixed structures such as a steel-piled jacket might be either technically infeasible or uneconomical due to the water depth.

Subsea equipment may be used for the injection of water/gas into various formations for disposal and/or to provide pressure maintenance to the reservoir, and/or for gas lifting operations.

### 4.2 System configuration

The elements of the subsea production or injection system may be configured in numerous ways, as dictated by the specific requirements and the field development strategy. For a description of the various components, assemblies, and subsystems that can be combined to form a complete subsea system, refer to API 17TR13. [Figure 1](#) provides an overview of a basic subsea system.

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## Key

1	LMRP	10	XT
2	marine riser	11	wellhead
3	flex joint	12	jumper
4	BOP	13	HCM
5	workover riser	14	HIPPS
6	stress joint	15	manifold
7	EDP	16	flowline
8	ERP/well control module	17	process station
9	SCM		

Figure 1 — Basic Subsea Systems

## 4.3 Overview of API 17 series Documents by Categories

## 4.3.1 System Level Documents

NOTE Currently only ISO 13628-1 is updated to mirror API RP 17A. The remaining documents in the ISO 13628 series are expected to be updated in the same manner at a later stage.

Subsea documents that address system requirements include:

- API 17A, Recommended Practice for the Design and Operation of Subsea Production Systems—General Requirements and Recommendations. Provides general requirements and recommendations for