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**Erdöl- und Erdgasindustrie –
Untertage-Sicherheitsventilsysteme –
Auslegung, Einbau, Betrieb und Instandsetzung (ISO 10417:2004);
Englische Fassung EN ISO 10417:2004**

Petroleum and natural gas industries –
Subsurface safety valve systems –
Design, installation, operation and redress (ISO 10417:2004);
English version EN ISO 10417:2004

Industries du pétrole et du gaz naturel –
Systèmes de vannes de protection de fond de puits –
Étude, installation, fonctionnement et réparation (ISO 10417:2004);
Version anglaise EN ISO 10417:2004

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Nationales Vorwort

Diese Europäische Norm wurde vom Technischen Komitee CEN/TC 12 „*Materialien, Ausrüstungen und Offshore-Bauwerke für die Erdöl- und Erdgasindustrie*“ (Sekretariat: Frankreich) erstellt. Es handelt sich dabei um die unveränderte Übernahme von ISO 10417:2004, erarbeitet vom ISO/TC 67 „*Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*“, Subkomitee SC 4 „*Drilling and production equipment*“. Für Deutschland war der Normenausschuss Erdöl- und Erdgasgewinnung (NÖG), Arbeitskreis 12/67 AK 4 „*Bohr- und Fördereinrichtungen*“, beteiligt.

Diese Europäische Norm enthält unter Berücksichtigung des DIN-Präsidialbeschlusses 13/1983 nur die englische Originalfassung der ISO-Norm.

English version

Petroleum and natural gas industries – Subsurface safety valve
systems – Design, installation, operation and redress
(ISO 10417:2004)

Industries du pétrole et du gaz naturel – Systèmes de
vannes de protection de fond de puits – Étude, installation,
fonctionnement et réparation (ISO 10417:2004)

Erdöl- und Erdgasindustrie – Untertage-
Sicherheitsventilsysteme – Auslegung, Einbau, Betrieb und
Instandsetzung (ISO 10417:2004)

This European Standard was approved by CEN on 7 June 2004.

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Foreword

This document (EN ISO 10417:2004) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum and natural gas industries" in collaboration with Technical Committee CEN/TC 12 "Materials, equipment and offshore structures for petroleum and natural gas industries", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 10417:2004 has been approved by CEN as EN ISO 10417:2004 without any modifications.

Introduction

This International Standard has been developed by users/purchasers and suppliers/manufacturers of subsurface safety valve (SSSV) equipment intended for use in the petroleum and natural gas industry worldwide. This International Standard is intended to give requirements and information to both parties on the design, operation, installation and testing of subsurface safety valve system equipment and also the storage/transport, maintenance, and redress of the SSSV equipment.

Users of this International Standard should be aware that further or differing requirements might be needed for individual installations, storage/transport and maintenance. This International Standard is not intended to inhibit the user/purchaser from accepting alternative engineering solutions. This may be particularly applicable where there is innovative or developing well-completion technology.

1 Scope

This International Standard establishes requirements and provides guidelines for configuration, installation, test, operation and documentation of subsurface safety valve (SSSV) systems. In addition, this International Standard establishes requirements and provides guidelines for selection, handling, redress and documentation of SSSV downhole production equipment.

This International Standard is not applicable to repair activities.

NOTE ISO 10432 provides requirements for SSSV equipment repair.

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.

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

ISO 9712, *Non-destructive testing — Qualification and certification of personnel*

ISO 10432:—¹⁾, *Petroleum and natural gas industries — Downhole equipment — Subsurface safety valve equipment*

ISO 16070, *Petroleum and natural gas industries — Downhole equipment — Lock mandrels and landing nipples*

ANSI/NCSL Z 540-1, *Calibration — Calibration Laboratories and Measuring and Test Equipment — General Requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000 and the following apply.

3.1

control line

conduit utilized to transmit control signals to SCSSVs

3.2

emergency shutdown system

system of stations which, when activated, initiate facility shutdown

3.3

equalizing feature

SSSV mechanism which permits the well pressure to bypass the SCSSV closure mechanism

3.4

fail-safe device

device which, upon loss of the control medium, automatically shifts to a safe position

3.5

fail-safe setting depth

maximum true vertical depth at which an SCSSV can be set and closed under worst-case hydrostatic conditions

1) To be published.

3.6**maintenance**

service operations performed on SSSV system equipment as part of routine operations

3.7**manufacturer**

principal agent in the design, fabrication and furnishing of original SSSV system equipment

3.8**operating manual**

publication issued by the manufacturer, which contains detailed data and instructions related to the design, installation, operation and maintenance of SSSV system equipment

3.9**operator**

user of SSSV system equipment

[ISO 10432]

3.10**orifice**

designed restriction which causes the pressure drop in velocity-type SSCSVs

3.11**packaging**

enclosure(s) of sufficient structural integrity to protect contents from damage or contamination, including impacts and environmental conditions encountered during the various phases of transport

3.12**qualified part**

part manufactured under a recognized quality assurance programme and, in the case of replacement, produced to meet or exceed the performance of the original part produced by the original equipment manufacturer (OEM)

NOTE ISO 9001 is an example of a recognized quality assurance programme.

3.13**qualified personnel**

personnel with characteristics or abilities, gained through training and/or experience as measured against established requirements, standards or tests, that enable the individual to perform a required function

3.14**redress**

any activity involving the replacement of **qualified parts** (3.12) within the limits described in 5.3.3

3.15**repair**

any activity beyond the scope of redress that includes disassembly, re-assembly and testing, with or without the replacement of qualified parts, and may include machining, welding, heat-treating or other manufacturing operations, that restores the equipment to its original performance

3.16**safety valve landing nipple**

any receptacle containing a profile designed for the installation of an SSSV lock mandrel

NOTE It may be ported for communication to an outside source for SSSV operation.

3.17**safety valve lock mandrel**

retention device used for SSSV equipment

3.18

self-equalizing feature

SCSSV mechanism which, on initiation of opening sequence of the SSSV, permits the well pressure to automatically bypass the SCSSV closure mechanism

3.19

storage

act of retaining SSSV system equipment without damage or contamination, after processing is completed and prior to or after field use, including the transport process

3.20

SSSV system equipment

components which include the **surface-control system** (3.2.4), **control line** (3.1), **SSSV** (3.23), **safety valve lock** (3.17), **safety valve landing nipple** (3.16), flow couplings and other downhole control components

3.21

surface-controlled subsurface safety valve

SCSSV

SSSV controlled from the surface by hydraulic, electrical, mechanical or other means

3.22

subsurface-controlled subsurface safety valve

SSCSV

SSSV actuated by the characteristics of the well itself

NOTE These devices are usually actuated by the differential pressure through the SSCSV (velocity type) or by tubing pressure at the SSCSV (high or low pressure type).

3.23

subsurface safety valve

SSSV

device whose design function is to prevent uncontrolled well flow when closed

NOTE These devices can be installed and retrieved by wireline or pump-down methods (wireline-retrievable) or be an integral part of the tubing string (tubing-retrievable).

[ISO 10432]

3.24

surface control system

surface equipment including manifolding, sensors, and power source to control the SCSSV

3.25

surface safety valve

SSV

automatic wellhead valve assembly which closes upon loss of power supply

NOTE Where used in this International Standard, the term is understood to include an SSV valve and SSV actuator.

[ISO 10423]

3.26

transport

actions required to ship SSSV system equipment from one geographic location to another

3.27

underwater safety valve

USV

automatic valve assembly (installed at an underwater wellhead location) which will close upon loss of power supply

NOTE Where used in this International Standard, the term is understood to include a USV valve and USV actuator.

[ISO 10423]

3.28**well test rate**

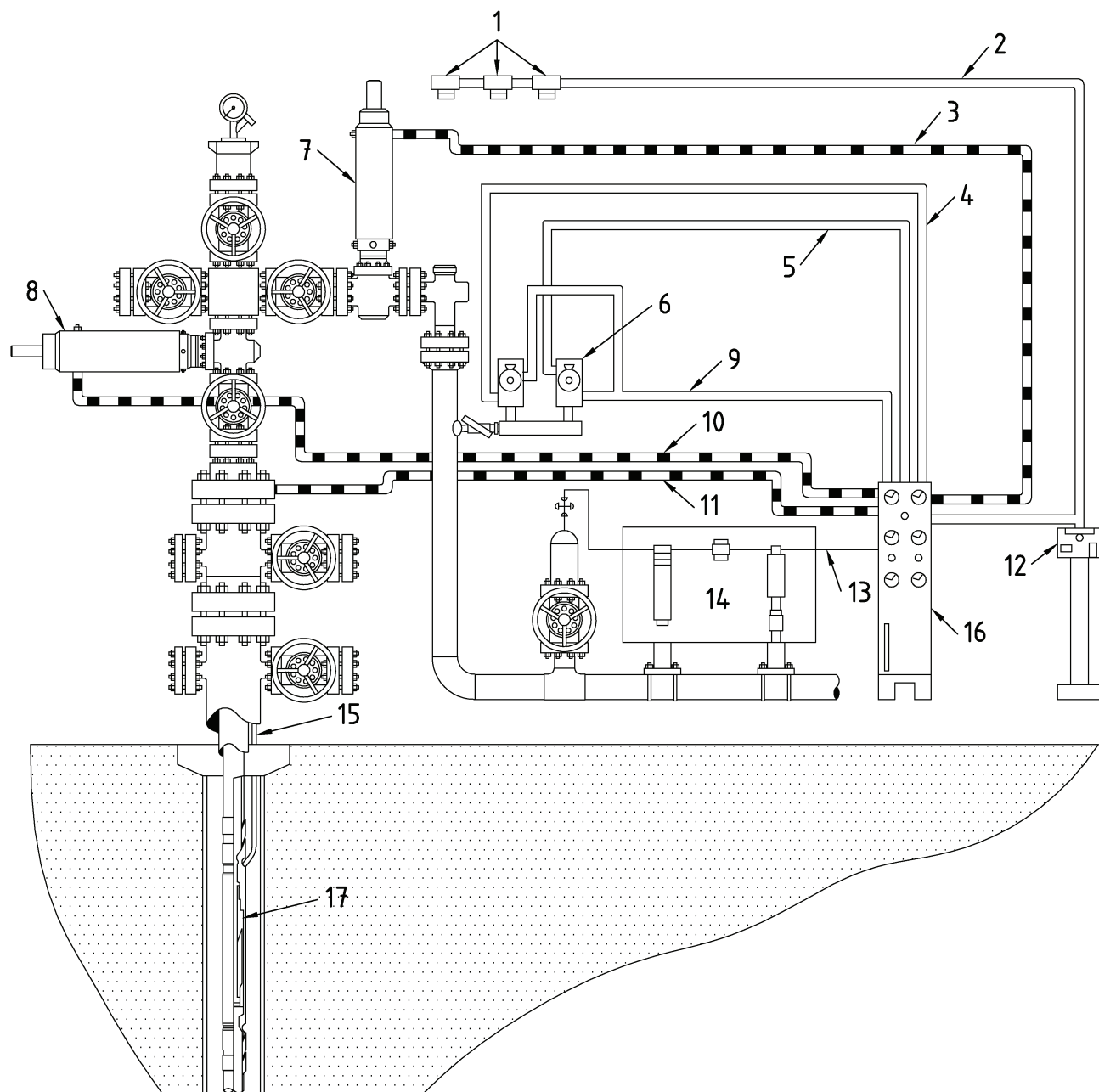
stabilized rate at which the well is produced on a routine basis

4 Abbreviated terms

ESD	emergency shut-down
FSSD	fail-safe setting depth
NDE	non-destructive examination
OEM	original equipment manufacturer
SCSSV	surface-controlled subsurface safety valve
SDV	shutdown valve
SSCSV	subsurface-controlled subsurface safety valve
SSSV	subsurface safety valve
SSV	surface safety valve
SVLN	safety valve landing nipple
TFL	through flow line
TRSV	tubing-retrievable safety valve
TR-SCSSV	tubing-retrievable surface-controlled subsurface safety valve
USV	underwater safety valve

5 System configuration**5.1 General**

Subsurface safety valve systems are provided for the prevention of uncontrolled well flow when actuated. They include SCSSVs and SSCSVs, which are positioned below the wellhead and below ground level/mudline and are installed/retrieved by tubing, wireline, and TFL and their control systems (see Figure 1).



- | | |
|---|---|
| 1 fusible plugs | 10 hydraulic/pneumatic pressure to master valve |
| 2 ESD pressure line [207 kPa to 345 kPa (30 psi to 50 psi)] | 11 hydraulic pressure line to SCSSV |
| 3 hydraulic/pneumatic pressure line to wing valve | 12 manual remote emergency shutdown station |
| 4 high pilot signal | 13 supply line |
| 5 low pilot signal | 14 flowline scrubber assembly |
| 6 pilot box | 15 hydraulic pressure line to the SCSSV |
| 7 wing SSV hydraulic or pneumatic actuator | 16 hydraulic/pneumatic control panel |
| 8 master SSV hydraulic or pneumatic actuator | 17 surface-controlled subsurface safety valve (SCSSV) |
| 9 supply to pilots [172 kPa (25 psi)] | |

Figure 1 — Example: Surface-controlled subsurface safety valve system