SLOVENSKI STANDARD
SIST EN ISO 13354:2014

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Industrija za predelavo nafte in zemeljskega plina - Vrtalna in proizvodna oprema - Oprema "Shallow gas diverter" (ISO 13354:2014)

Petroleum and natural gas industries - Drilling and production equipment - Shallow gas diverter equipment (ISO 13354:2014)

Erdöl- und Erdgasindustrie - Shallow gas Diverterausrüstung (ISO 13354:2014)

Industries du pétrole et du gaz naturel - Équipements de forage et de production - Équipement déflecteur pour gaz de surface (ISO 13354:2014)

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Erdöl- und Erdgasindustrie - Shallow gas Diverterausrüstung (ISO 13354:2014)

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Foreword

This document (EN ISO 13354:2014) 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 12 “Materials, equipment and offshore structures for petroleum, petrochemical 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of an identical text or by endorsement, at the latest by November 2014, and conflicting national standards shall be withdrawn at the latest by November 2014.

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INTERNATIONAL STANDARD

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Petroleum and natural gas industries — Drilling and production equipment — Shallow gas diverter equipment

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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.

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 67, *Petroleum and Natural gas industries*, Subcommittee SC 4, *Drilling and production equipment*.

Introduction

Drilling into shallow-gas-bearing formations is a very delicate and challenging operation. If the drilling operations are seriously complicated by the reduced safety margin available between kick and loss, the situation in case of a gas influx becomes extremely hazardous, due to a combination of the following adverse factors.

— Shallow gas flows are extremely fast-developing events; there is only a short transition time between influx detection and well unloading, resulting in a reduced time for the driller to take the right decision, and leaving little room for error.

— Past blowout reports have disclosed the magnitude of severe dynamic loads applied to surface diverting equipment. One of the associated effects is erosion, which adds a high potential for fire and explosion due to flow impingement on rig facilities which gives the gas flow access to various sources of ignition.

— Many past shallow-gas kicks turned into uncontrolled blowouts due to the failure of former diverter systems installed several decades ago. Failure is seen as a result of the system's complexity, its lack of functional reliability and its inability to cope with the severe dynamic loads.

— Certain drilling supports are exposed to specific threats associated with shallow gas blowouts, e.g. risk of cratering, risk of ship-shaped vessel capsize.

— Unprepared or inadequately trained drilling crews experience a high level of stress when facing a violent shallow gas flow.

In the aftermath of shallow gas blowouts during the last four decades, comprehensive inquiries and reports have been carried out, in particular by the specialists involved in combating these events, and significant findings and conclusions have been published. In the meantime, the manufacturing industry has developed various equipment aimed at significantly improving the safety of shallow-gas drilling operations.

This International Standard has been prepared taking these aspects into consideration.

Petroleum and natural gas industries — Drilling and production equipment — Shallow gas diverter equipment

1 Scope

This International Standard specifies requirements for the selection of the diverter equipment for rigs used to drill shallow-gas-bearing formations. It covers both onshore and offshore drilling operations, and considers also the auxiliary equipment associated with floating rigs.

The specified requirements concern the following diverter equipment:

— annular sealing devices;

— vent outlets;

— diverter valves;

— diverter piping.

This International Standard highlights the concerns associated with the selection of a marine floating drilling support. It covers safety issues concerning key rig equipment, and important steps of action required prior to starting the drilling operations.

It provides only general guidelines regarding the response to be given to a shallow-gas flow.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13533, *Petroleum and natural gas industries — Drilling and production equipment — Drill-through equipment*

API 16D (latest revision), *Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment*

3 Terms and definitions

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

3.1
actuator
device used to open or close a valve by means of applied manual, hydraulic, pneumatic or electrical energy

3.2
annular packing element
doughnut-shaped rubber/elastomer element that creates a seal in an annular preventer or diverter

Note 1 to entry: The annular packing element is displaced toward the bore centre by the upward movement of an annular piston.

3.3
annular sealing device
torus-shaped steel housing containing an annular packing element which facilitates closure of the annulus by constricting to seal on the pipe or kelly in the wellbore

Note 1 to entry: Some annular sealing devices also facilitate shutoff of the open hole.

3.4
bag preventer
device that can seal around any object in the wellbore or upon itself

Note 1 to entry: Compression of a reinforced rubber/elastomer packing element by hydraulic pressure creates the seal.

3.5
ball valve
valve that employs a rotating ball to open or close the flow passage

3.6
blowout
uncontrolled flow of well fluids and/or formation fluids from the wellbore or into lower-pressured subsurface zones

Note 1 to entry: When the uncontrolled flow of fluids goes into lower-pressured subsurface zones, it is termed an underground blowout.

3.7
blowout preventer stack
BOP stack
device that allows the well to be sealed to confine the well fluids in the wellbore

3.8
bottom-supported marine structure
drilling structure supported by the soil on the seabed while in the operating mode

Note 1 to entry: Rigs of this type include fixed platforms, submersibles, swamp barges and jack-up drilling rigs.

3.9
cleanout
point in the flow-line piping where the internal area of the pipe can be accessed to remove accumulated debris and drill cuttings

3.10
closing unit
assemblage of pumps, valves, lines, accumulators and other items necessary to open and close the BOP equipment and diverter system

3.11
control function
control system circuit (hydraulic, pneumatic, electrical, mechanical, or a combination thereof) used to operate the position selection of a diverter unit, BOP, valve or regulator

EXAMPLE Diverter “close” function, starboard vent valve “open” function.

3.12
control function
each position of a diverter unit, BOP or valve and each regulator assignment that is operated by the control system

3.13
diverter
device attached to the wellhead or marine riser to close the vertical access and to direct any flow into a set of vent lines and away from the drilling unit

3.14
diverter control system
assemblage of pumps, accumulators, manifolds, control panels, valves, lines, etc., used to operate the diverter system

3.15
diverter housing
permanent installation under the rotary table which houses the insert-type diverter assembly

3.16
diverter packer
annular sealing device of the diverter

3.17
diverter piping
vent lines of the diverter

3.18
diverter system
assemblage, comprising an annular sealing device, flow control means, vent system components and control system, which facilitates closure of the upward flow path of the well fluid and opening of the vent to the atmosphere

3.19
diverter unit
device that embodies the annular sealing device and its actuating means

3.20
drill floor substructure
foundation structure on which the derrick, rotary table, draw-works and other drilling equipment are supported

3.21
drilling spool
flanged joint placed between the BOP and casing-head that serves as a spacer or crossover

3.22
drill ship
self-propelled, floating, ship-shaped vessel equipped with drilling equipment

3.23
dump valve
device used to control bottom-riser annulus pressure by establishing direct communication with the sea

3.24
dynamically positioned drilling vessel
DP drilling vessel
drill-ship or semi-submersible drilling rig equipped with computer-controlled thrusters which enable it to maintain a constant position relative to a fixed point on the sea floor without the use of anchors and mooring lines while conducting floating drilling operations

3.25
elastomer
any of various elastic compounds or substances resembling rubber