Irish Standard
I.S. EN ISO 16530-1:2017

Petroleum and natural gas industries - Well integrity - Part 1: Life cycle governance (ISO 16530-1:2017)

I.S. EN ISO 16530-1:2017

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN ISO 16530-1:2017 is the adopted Irish version of the European Document EN ISO 16530-1:2017, Petroleum and natural gas industries - Well integrity - Part 1: Life cycle governance (ISO 16530-1:2017)

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 16530-1

March 2017

ICS 75.180.10

English Version

Petroleum and natural gas industries - Well integrity - Part 1: Life cycle governance (ISO 16530-1:2017)

Pétrole et industries du gaz naturel - Intégrité du puits - Partie 1: Gouvernance du cycle de vie (ISO 16530-1:2017)

Erdöl- und Erdgasindustrie - Bohrungsintegrität - Teil 1: Leitlinien zur Lebenszykluslenkung (ISO 16530-1:2017)

This European Standard was approved by CEN on 3 February 2017.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Page

European foreword

This document (EN ISO 16530-1:2017) 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 NEN.

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of an identical text or by endorsement, at the latest by September 2017 and conflicting national standards shall be withdrawn at the latest by September 2017.

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

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Endorsement notice

The text of ISO 16530-1:2017 has been approved by CEN as EN ISO 16530-1:2017 without any modification.

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INTERNATIONAL STANDARD

ISO 16530-1

First edition
2017-03

Petroleum and natural gas industries — Well integrity —

Part 1: Life cycle governance

Pétrole et industries du gaz naturel — Intégrité du puits —

Partie 1: Gouvernance du cycle de vie

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Contents

Page

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).

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 4, *Drilling and production equipment*.

A list of all parts in the ISO 16530 series can be found on the ISO website.

Introduction

This document has been developed by oil and gas producing operating companies and is intended for use in the petroleum and natural gas industries worldwide. This document is intended to provide guidance to the well operator on managing well integrity throughout the well life cycle. Furthermore, this document addresses the minimum compliance requirements for the well operator in order to claim conformity with this document.

It is necessary that users of this document are aware that requirements over and above those outlined herein may be needed for individual applications.

This document addresses the process of managing well integrity during each of the well life cycle phases, namely: basis of design; design; construction; operation; intervention (including work-over) and abandonment.

The following terminology, in line with ISO/IEC Directives, is used in this document:

a) The term “shall” denotes a minimum requirement in order to conform to this document.

b) The term “should” denotes a recommendation or that which is advised but not required in order to conform to this document.

c) The term “may” is used to indicate a course of action permissible within the limits of this document.

d) The term “can” is used to express possibility or capability.

In addition, the term “consider” is used to indicate a suggestion or to advise.

The phases of a well life cycle have separate and distinct requirements for achieving well integrity management objectives, but all phases have common elements and techniques. Clause 5 discusses these common elements and techniques. Clauses 6 to 11 discuss each individual phase and its requirements. Additionally, each clause highlights the aspects to be considered within the common elements and techniques as applicable to that phase.

Figure 1 summarizes the elements which are common among phases, and the relation between the phases.

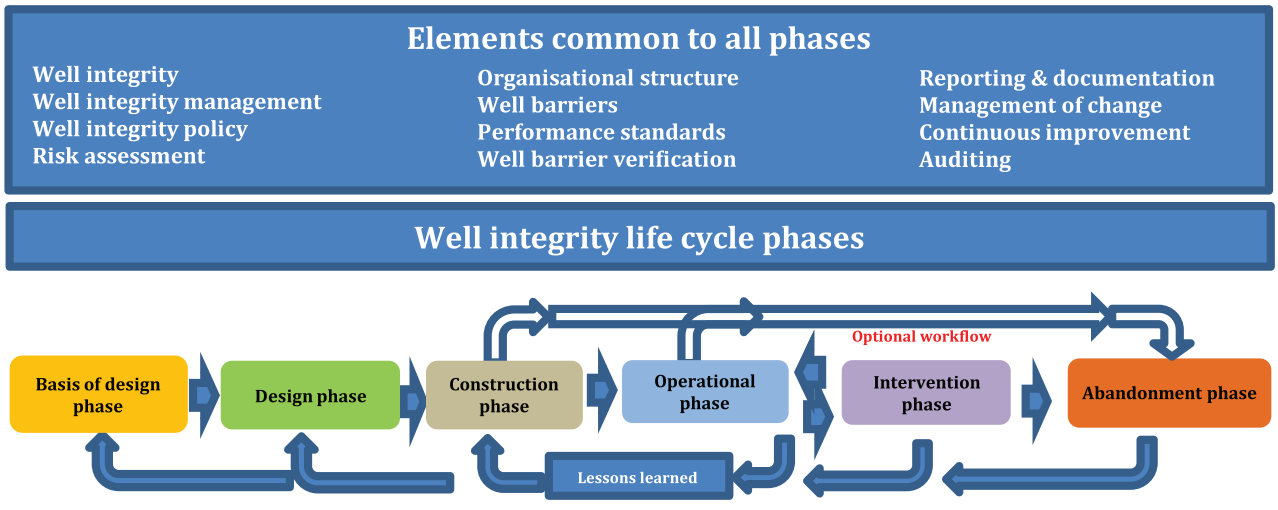

Figure 1 — Elements common to the phases of well integrity management

Petroleum and natural gas industries — Well integrity —

Part 1: Life cycle governance

1 Scope

This document is applicable to all wells that are operated by the petroleum and natural gas industry. This document is applicable to any well, or group of wells, regardless of their age, location (including onshore, subsea and offshore wells) or type (e.g. naturally flowing, artificial lift, injection wells).

This document is intended to assist the petroleum and natural gas industry to effectively manage well integrity during the well life cycle by providing:

— minimum requirements to ensure management of well integrity; and

— recommendations and techniques that well operators can apply in a scalable manner based on a well's specific risk characteristics.

Assuring well integrity comprises two main building blocks: the first is to ensure well integrity during well design and construction, and the second is to manage well integrity throughout the remaining well life thereafter.

This document addresses each stage of the well life cycle, as defined by the six phases in a) to f), and describes the deliverables between each phase within a Well Integrity Management system.

a) The "**Basis of Design Phase**" identifies the probable safety and environmental exposure to surface and subsurface hazards and risks that can be encountered during the well life cycle. Once identified, these hazards and risks are assessed such that control methods of design and operation can be developed in subsequent phases of the well life cycle.

b) The "**Design Phase**" identifies the controls that are to be incorporated into the well design, such that appropriate barriers can be established to manage the identified safety and environmental hazards. The design addresses the expected, or forecasted, changes during the well life cycle and ensures that the required barriers in the well's design are based on risk exposure to people and the environment.

c) The "**Construction Phase**" defines the required or recommended elements to be constructed (including rework/repair) and verification tasks to be performed in order to achieve the intended design. It addresses any variations from the design which require a revalidation against the identified hazards and risks.

d) The "**Operational Phase**" defines the requirements or recommendations and methods for managing well integrity during operation.

e) The "**Intervention Phase**" (including work-over) defines the minimum requirements or recommendations for assessing well barriers prior to, and after, any well intervention that involves breaking the established well barrier containment system.

f) The "**Abandonment Phase**" defines the requirements or recommendations for permanently abandoning a well.

The six phases of the well life cycle, as defined in this Scope, and their interrelationships, are illustrated in Figure 1 in the Introduction.

This document is not applicable to well control. Well control refers to activities implemented to prevent or mitigate unintentional release of formation fluids from the well to its surroundings during drilling, completion, intervention and well abandonment operations, and involves dynamic elements, i.e. BOPs, mud pumps, mud systems, etc.

This document is not applicable to wellbore integrity, sometimes referred to as “borehole stability”. Wellbore integrity is the capacity of the drilled open hole to maintain its shape and remain intact after having been drilled.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
A-annulus
designation of the annulus between production tubing and production casing

[SOURCE: API RP 90, modified]

3.2
acceptance criteria
specified limits of acceptability applied to process, service, or product characteristics

3.3
as low as reasonably practicable
ALARP
implementation of risk-reducing measures until the cost (including time, capital costs or other resources/assets) of further risk reduction is disproportional to the potential risk reducing effect achieved by implementing any additional measure

Note 1 to entry: See UK HSE.[27]

3.4
ambient pressure
pressure external to the wellhead

Note 1 to entry: In the case of a surface wellhead, the pressure is 0 kPa (0 psig). In the case of a subsea wellhead, it is equal to the hydrostatic pressure of seawater at the depth of the subsea wellhead.

[SOURCE: API RP 90, modified]

3.5
anomaly
condition that differs from what is expected or typical, or which differs from that predicted by a theoretical model

3.6
availability
extent to which the system/structure/equipment is capable of retaining its functional integrity