Recommended Practice for Inspection and Classification of Used Drill Stem Elements

ANSI/API RECOMMENDED PRACTICE 7G-2
FIRST EDITION, AUGUST 2009

ERRATA 1: OCTOBER 2009

REAFFIRMED, APRIL 2015

ISO 10407-2:2008 (Identical), Petroleum and natural gas industries—Rotary drilling equipment—Part 2: Inspection and classification of used drill stem elements

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 10407-2 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*.

This first edition of ISO 10407-2, together with ISO 10407-1, replaces ISO 10407:1993, which will be cancelled when both ISO 10407-1 and ISO 10407-2 have been published and which has been technically revised.

ISO 10407 consists of the following parts, under the general title *Petroleum and natural gas industries — Rotary drilling equipment*:

— *Part 2: Inspection and classification of used drill stem elements*

A Part 1, dealing with drill stem design and operating limits, is under development.

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Introduction

Users of this International Standard should be aware that further or differing requirements can be needed for individual applications. This International Standard is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This can be particularly applicable where there is innovative or developing technology. Where an alternative is offered, the vendor should identify any variations from this International Standard and provide details.

This International Standard shall become effective on the date printed on the cover but may be used voluntarily from the date of distribution.

This International Standard includes provisions of various natures. These are identified by the use of certain verbal forms:

— SHALL is used to indicate that a provision is MANDATORY;

— SHOULD is used to indicate that a provision is not mandatory, but RECOMMENDED as good practice;

— MAY is used to indicate that a provision is OPTIONAL;

— CAN is used to indicate a POSSIBILITY.

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Petroleum and natural gas industries — Rotary drilling equipment —

Part 2:
Inspection and classification of used drill stem elements

1 Scope

This part of ISO 10407 specifies the required inspection for each level of inspection (Tables B.1 through B.15) and procedures for the inspection and testing of used drill stem elements. For the purpose of this part of ISO 10407, drill stem elements include drill pipe body, tool joints, rotary-shouldered connections, drill collar, HWDP and the ends of drill stem elements that make up with them. This part of ISO 10407 has been prepared to address the practices and technology commonly used in inspection.

The practices established within this part of ISO 10407 are intended as inspection and/or testing guidance and are not intended to be interpreted to prohibit the agency or owner from using personal judgement, supplementing the inspection with other techniques, extending existing techniques or re-inspecting certain lengths.

This part of ISO 10407 specifies the qualification of inspection personnel, a description of inspection methods and apparatus calibration and standardization procedures for various inspection methods. The evaluation of imperfections and the marking of inspected drill stem elements is included.

This part of ISO 10407 provides the original equipment manufacturers' requirements regarding the minimum information needed for the inspection of their specialized tools in Annex A.

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 10424-1, *Petroleum and natural gas industries — Rotary drilling equipment — Part 1: Rotary drill stem elements*

ISO 11961, *Petroleum and natural gas industries — Steel drill pipe*

API RP 7A1, *Testing of Thread Compound for Rotary Shouldered Connections*

3 Terms and definitions

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

3.1
agency
entity contracted to inspect used drill stem elements using the methods and criteria specified

3.2
A-scan
ultrasonic instrument display where distance is represented on the horizontal axis and signal strength on the vertical axis

3.3
bending-strength ratio
BSR
ratio of the section modulus of the box thread at its last engaged thread to the pin thread at its last engaged thread

3.4
bevel diameter
outer diameter of the contact face of the rotary shouldered connection

3.5
bit sub
sub, usually with two box connections, that is used to connect the bit to the drill stem

3.6
bottleneck sub
sub with two distinct outside diameters

3.7
box end
end of pipe with internal threads

3.8
box thread
internal (female) threads of a rotary shouldered connection

3.9
class 2
second in the hierarchy of used drill pipe service classifications for used drill pipe that does not meet premium class requirements

3.10
class 3
third in the hierarchy of used drill pipe service classifications for used drill pipe that does not meet class 2 requirements

3.11
calibration
adjustment of instruments to a known basic reference often traceable to the national standards body

NOTE Calibration typically is documented in a log book and by a tag applied to the instrument.

3.12
check
go/no-go determination that dimension is within tolerances

3.13
corrosion
alteration and degradation of material by its environment

3.14
critical area
area from the base of the tapered shoulder of the tool joint to a plane located 660 mm (26.0 in) away, or the end of the slip marks, whichever distance is greater

See Figure 4.

NOTE When applied to the work-string tubing area, it is from the end of the pipe to a plane located 508 mm (20 in) away, or the end of the slip marks, whichever distance is greater.

3.15
cut
incision without removal of metal caused by a sharp object

3.16
dent
local change in surface contour caused by mechanical impact, but not accompanied by loss of metal

3.17
drift
cylindrical gauge used to check the minimum inside diameter

3.18
drill collar
thick-walled pipe or tube designed to provide stiffness and concentration of mass at or near the bit

3.19
drill pipe
drill pipe body with weld-on tool joints

See Figure 1.

3.20
drill-pipe body
seamless steel pipe with upset ends

See Figure 1.

3.21
drill stem
all members between the swivel or top drive and the bit; includes drill string

3.22
drill string
several sections or joints of drill pipe with the tool joints that are joined together

3.23
failure
improper performance of a device or equipment that prevents completion of its design function

3.24
fatigue
process of progressive localized permanent structural change occurring in a material subjected to conditions that produce fluctuating stresses and strains at some point or points and that can culminate in cracks or complete fracture after a sufficient number of fluctuations