INTERNATIONAL STANDARD

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Petroleum and natural gas industries — Drilling and production equipment — Inspection, maintenance, repair and remanufacture of hoisting equipment

Industries du pétrole et du gaz naturel — Équipement de forage et de production — Vérification, maintenance, réparation et fabrication à partir de matériaux recyclés du matériel de levage

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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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 13534 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*, Subcommittee SC 4, *Drilling and production equipment*.

Introduction

This International Standard is based on API RP 8B, 6th edition, December 1997 [1].

Users of this International Standard should be aware that further or differing requirements may be needed for individual applications. This International Standard is not intended to inhibit the user from utilizing alternative equipment, methods or engineering solutions for individual applications. This may 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.

Petroleum and natural gas industries — Drilling and production equipment — Inspection, maintenance, repair and remanufacture of hoisting equipment

1 Scope

This International Standard gives guidelines and establishes requirements for inspection, maintenance, repair and remanufacture of items of hoisting equipment used in drilling and production operations, in order to maintain the serviceability of this equipment.

Items of drilling and production hoisting equipment covered by this International Standard are:

— crown-block sheaves and bearings;

— travelling blocks and hook blocks;

— block-to-hook adapters;

— connectors and link adapters;

— drilling hooks;

— tubing hooks and sucker-rod hooks;

— elevator links;

— casing elevators, tubing elevators, drill-pipe elevators and drill-collar elevators;

— sucker-rod elevators;

— rotary swivel-bail adapters;

— rotary swivels;

— power swivels;

— power subs;

— spiders, if capable of being used as elevators;

— dead-line tie-down/wireline anchors;

— drill-string motion compensators;

— kelly spinners, if capable of being used as hoisting equipment;

— riser-running tool components, if capable of being used as hoisting equipment;

— wellhead-running tool components, if capable of being used as hoisting equipment;

— safety clamps, capable of being used as hoisting equipment.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

3 Terms, definitions and abbreviated terms

For the purposes of this International Standard, the following terms, definitions and abbreviated terms apply.

3.1 Terms and definitions

3.1.1
critical area
highly stressed region of a primary-load-carrying component as defined by the manufacturer

3.1.2
expendable parts
parts normally used up or consumed in service.

EXAMPLES Seals, gaskets, filters, packing, V-belts, covers, guards, breathers, drains and miscellaneous hardware and fasteners.

3.1.3
inspection
comparison of equipment conformity to predetermined standards, followed by a determination of action required

3.1.4
load test
test wherein a load is applied under controlled and monitored conditions to verify the serviceability of equipment

3.1.5
maintenance
actions including inspection, adjustments, cleaning, lubrication, testing, and replacement of expendable parts, as necessary to maintain the serviceability of the equipment

3.1.6
manufacturer
individual or company that makes or processes equipment or material covered by this International Standard

3.1.7
owner
individual, legal entity or organization holding legal title to the equipment

3.1.8
primary load
axial load to which the equipment is subjected in operation

3.1.9
primary-load-carrying component
component of the equipment through which the primary load is carried

3.1.10
remanufacture
action performed on equipment that involves a special process or re-machining

3.1.11
repair
action performed on equipment that involves replacement of parts, other than expendable parts, but excludes remanufacture

3.1.12
serviceability
condition of a piece of equipment at any point in time that affects the ability of the equipment to perform its function(s) as intended

3.1.13
special process
operation that can change or affect the mechanical properties, including toughness, of the materials used in equipment

3.1.14
testing
action carried out on a piece of equipment to ensure that it can perform a required function

3.1.15
user
individual or company that uses equipment or material, or implements standards

3.2 Abbreviated terms

MT	magnetic particle testing
NDT	non-destructive testing
PSL	product specification level
PT	liquid penetrant testing
RT	radiographic testing
UT	ultrasonic testing

4 General principles

4.1 Procedures

4.1.1 General

Users/owners of hoisting equipment shall establish written procedures for inspection, maintenance, repair and remanufacture of each item of equipment.

4.1.2 Procedure development

4.1.2.1 User/owner and manufacturer joint procedure development

The user/owner and manufacturer should jointly develop and update inspection, maintenance, repair and remanufacture procedures consistent with equipment application, loading, work environment, usage, and operational conditions.

These factors may change as a result of new technology, product improvements or fundamental changes in service conditions.

4.1.2.2 User/owner procedure development

If the manufacturer of the equipment no longer exists or is unable for any reason to provide suitable recommendations, the user/owner shall develop inspection, maintenance, repair and remanufacture procedures consistent with widely-accepted industry practices.

4.1.2.3 Parts and tooling

NDT, maintenance, and dismantling equipment shall be properly selected and adapted to the parts to be inspected and maintained.

4.2 Personnel qualification

4.2.1 NDT personnel qualification levels

4.2.1.1 Qualification

Inspectors shall be aware of the type of equipment to be evaluated and the NDT methods to apply.

The users/owners shall verify that the NDT inspector has the following information:

— assembly drawings and drawings identifying critical areas;

— rejection criteria.

In addition, the users/owners may provide the history of grinding or remanufacture, if available.

In the absence of critical area drawings, all areas of primary-load-carrying components shall be considered critical.

These data shall be used by the inspector to adapt the inspection procedure.

4.2.1.2 Certification

The NDT inspector shall be certified according to ISO 9712 or by other recognized NDT certification programmes or standards.

4.2.2 Welding personnel qualification levels

Welders shall be qualified to a recognized standard.

5 Inspection and maintenance

5.1 General

5.1.1 Criteria

Inspection and maintenance are closely linked. Inspection and maintenance actions may be initiated based on, but not limited to, one or more of the following criteria:

— specific time intervals;

— measurable wear limits;

— load cycle accumulation;

— non-performance of equipment;

— environment;

— experience (history);

— regulatory requirements.

5.1.2 Safety considerations

Operators shall review safety considerations applicable to the site where the maintenance activity is performed.

5.2 Maintenance

5.2.1 General

Maintenance of equipment consists of actions such as adjustments, cleaning, lubrication, and replacement of expendable parts. The complexity of these activities and the safety risks involved shall be considered in the assignment of appropriate resources such as facilities, equipment and qualified personnel.

5.2.2 Procedures

In addition to the procedures developed in accordance with 4.1, the manufacturer should define any special tools, materials, measuring and inspection equipment, and personnel qualifications necessary to perform the maintenance. The manufacturer should also specify those procedures that should be performed solely by the manufacturer, either within the manufacturer's facility or within another approved facility.

5.3 Inspection

5.3.1 General

The existence of cracks can indicate severe deterioration and impending failure. Their detection, identification and evaluation require accurate inspection methods.

Prompt attention is then required either to remove the equipment from service immediately or to provide appropriate service and/or repair.

Caution shall be exercised to take into account the increased susceptibility to brittle fracture of many steels when operating at low temperatures.

If any manufacturing defects are discovered, they should be reported to the manufacturer or supplier.

5.3.2 Inspection categories

5.3.2.1 General

The objective of these inspections is to detect service defects and possible hidden manufacturing defects.

Inspection results shall be reported on equipment files and drawings.

5.3.2.2 Category I

This category involves observing the equipment during operation for indications of inadequate performance.

When in use, equipment shall be visually inspected on a daily basis for cracks, loose fits or connections, elongation of parts, and other signs of wear, corrosion or overloading. Any equipment found to show cracks, excessive wear, etc., shall be removed from service for further examination.