SLOVENSKI STANDARD
SIST EN ISO 20815:2008

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Petrokemiļ na industrija ter industrija za predelavo nafte in zemeljskega plina - Optimizacija proizvodnje in upravljanje zanesljivosti (ISO 20815:2008)

Petroleum, petrochemical and natural gas industries - Production assurance and reliability management (ISO 20815:2008)

Erdöl- und Erdgasindustrie - Betriebsoptimierung und Zuverlässigkeitsmanagement (ISO 20815:2008)

Industries du pétrole, de la pétrochimie et du gaz naturel - Assurance de la production et management de la fiabilité (ISO 20815:2008)

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ICS:

75.180.01	Oprema za industrijo nafte in zemeljskega plina na splošno	Equipment for petroleum and natural gas industries in general
75.200	Oprema za skladiļenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment

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Petroleum, petrochemical and natural gas industries - Production assurance and reliability management (ISO 20815:2008)

Industries du pétrole, de la pétrochimie et du gaz naturel - Assurance de la production et management de la fiabilité (ISO 20815:2008)

Erdöl- und Erdgasindustrie - Betriebsoptimierung und Zuverlässigkeitsmanagement (ISO 20815:2008)

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Foreword

This document (EN ISO 20815:2008) 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, petrochemical and natural gas industries” the secretariat of which is held by AFNOR.

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INTERNATIONAL STANDARD

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Petroleum, petrochemical and natural gas industries — Production assurance and reliability management

Industries du pétrole, de la pétrochimie et du gaz naturel — Assurance de la production et management de la fiabilité

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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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ISO 20815 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

Introduction

The petroleum and natural gas industries involve large capital investment costs as well as operational expenditures. The profitability of these industries is dependent upon the reliability, availability and maintainability of the systems and components that are used. Therefore, for optimal production availability in the oil and gas business, a standardized, integrated reliability approach is required.

The concept of production assurance, introduced in this International Standard, enables a common understanding with respect to use of reliability technology in the various life-cycle phases and covers the activities implemented to achieve and maintain a performance level that is at its optimum in terms of the overall economy and, at the same time, consistent with applicable regulatory and framework conditions.

Annexes A through I are for information only.

Petroleum, petrochemical and natural gas industries — Production assurance and reliability management

1 Scope

This International Standard introduces the concept of production assurance within the systems and operations associated with exploration drilling, exploitation, processing and transport of petroleum, petrochemical and natural gas resources. This International Standard covers upstream (including subsea), midstream and downstream facilities and activities. It focuses on production assurance of oil and gas production, processing and associated activities and covers the analysis of reliability and maintenance of the components.

It provides processes and activities, requirements and guidelines for systematic management, effective planning, execution and use of production assurance and reliability technology. This is to achieve cost-effective solutions over the life cycle of an asset-development project structured around the following main elements:

— production-assurance management for optimum economy of the facility through all of its life-cycle phases, while also considering constraints arising from health, safety, environment, quality and human factors;

— planning, execution and implementation of reliability technology;

— application of reliability and maintenance data;

— reliability-based design and operation improvement.

For standards on equipment reliability and maintenance performance in general, see the IEC 60300-3 series.

This International Standard designates 12 processes, of which seven are defined as core production-assurance processes and addressed in this International Standard. The remaining five processes are denoted as interacting processes and are outside the scope of this International Standard. The interaction of the core production-assurance processes with these interacting processes, however, is within the scope of this International Standard as the information flow to and from these latter processes is required to ensure that production-assurance requirements can be fulfilled.

This International Standard recommends that the listed processes and activities be initiated only if they can be considered to add value.

The only requirements mandated by this International Standard are the establishment and execution of the production-assurance programme (PAP).

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 14224:2006, *Petroleum, petrochemical and natural gas industries — Collection and exchange of reliability and maintenance data for equipment*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

3.1.1
availability
ability of an item to be in a state to perform a required function under given conditions at a given instant of time, or in average over a given time interval, assuming that the required external resources are provided

See Figure G.1 for further information.

3.1.2
common cause failure
failures of different items resulting from the same direct cause, occurring within a relatively short time, where these failures are not consequences of each other

3.1.3
corrective maintenance
maintenance that is carried out after a fault recognition and intended to put an item into a state in which it can perform a required function

See IEC 60050-191:1990, Figure 191-10 [2], for more specific information.

3.1.4
deliverability
ratio of deliveries to planned deliveries over a specified period of time, when the effect of compensating elements, such as substitution from other producers and downstream buffer storage, is included

See Figure G.1 for further information.

3.1.5
design life
planned usage time for the total system

NOTE Design life should not be confused with **MTTF** (3.1.25), which is comprised of several items that may be allowed to fail within the design life of the system as long as repair or replacement is feasible.

3.1.6
down state
internal disabled state of an item characterized either by a fault or by a possible inability to perform a required function during preventive maintenance [2]

NOTE This state is related to availability performance.

3.1.7
downtime
time interval during which an item is in a non-working state [2]

NOTE The downtime includes all the delays between the item failure and the restoration of its service. Downtime can be either planned or unplanned.

3.1.8
downstream
business process, most commonly in the petroleum industry, associated with post-production activities

EXAMPLES Refining, transportation and marketing of petroleum products.

3.1.9
failure
termination of the ability of an item to perform a required function

NOTE 1 After failure, the item has a fault.

NOTE 2 "Failure" is an event, as distinguished from "fault", which is a state.

3.1.10
failure cause
root cause
circumstances during design, manufacture or use that have led to a failure [2]

NOTE Generic failure cause codes applicable for equipment failures are defined in ISO 14224:2006, B.2.3.

3.1.11
failure data
data characterizing the occurrence of a failure event

3.1.12
failure mode
effect by which a failure is observed on the failed item

NOTE Failure-mode codes are defined for some equipment classes in ISO 14224:2006, B.2.6.

3.1.13
failure rate
limit, if this exists, of the ratio of the conditional probability that the instant of time, T, of a failure of an item falls within a given time interval, $(t + \Delta t)$ and the length of this interval, Δt, when Δt tends to zero, given that the item is in an up state at the beginning of the time interval

See ISO 14224:2006, Clause C.3 for further explanation of the failure rate.

NOTE 1 In this definition, t may also denote the time to failure or the time to first failure.

NOTE 2 A practical interpretation of failure rate is the number of failures relative to the corresponding operational time. In some cases, time can be replaced by units of use. In most cases, the reciprocal of **MTTF** (3.1.25) can be used as the predictor for the failure rate, i.e. the average number of failures per unit of time in the long run if the units are replaced by an identical unit at failure.

NOTE 3 The failure rate can be based on operational time or calendar time.

3.1.14
fault
state of an item characterized by inability to perform a required function, excluding the inability during preventive maintenance or other planned actions, or due to lack of external resources [2]

NOTE A fault is often a result of a failure of the item itself but the state can exist without a failure.

3.1.15
fault tolerance
attribute of an item that makes it able to perform a required function in the presence of certain given sub-item faults [2]

3.1.16
item
any part, component, device, subsystem, functional unit, equipment or system that can be individually considered [2]