Guidance on quality, conformance, reliability and cost aspects in standards - ISO/TC 67

April 2022
Discussion topics

1. Value of collaboration
2. Objectives
3. Good requirements writing – verifiable requirements
4. ISO Directives & Online Browsing Platform
5. WG4 on reliability and cost aspects
6. WG2 on quality, conformance and verification
7. Summary and Way forward
Realising & protecting value through collaboration
Objectives

• Advice on writing verifiable technical requirements
• Advice on drafting requirements for quality and conformity assessment (WG2)
• Advice on drafting requirements for reliability and cost (WG4).
• Guidance on use of the ISO Online Browsing Platform (OBP)
ISO/TC67 Organizational structure

ISO/TC 67 Chair

Management Committee

Secretariat NEN

ISO/TC 67 Organizational structure

WG2

WG4

Relations to WG2 and WG4

SC2
Pipeline transportation systems

SC4
Drilling and production equipment

SC5
Casing, tubing and drill pipe

SC10
Enhanced oil recovery

SC6
Processing equipment and systems

SC7
Offshore Structures

SC8
Arctic Operations

SC9
Liquefied natural gas installations and equipment

WG7
Corrosion resistant materials

WG8
Aluminium alloy pipes

WG9
Operating integrity management for the petroleum, petrochemical and natural gas industries

WG11
Coating and lining of structures & equipment

WG13
Bulk materials for offshore projects

WG14
Materials, corrosion control, welding and joining, and non-destructive examination (NDE)
Background – Ref. ISO/TC67 Plenary - Oct 2020

ISO/TC 67 N 1910

Resolution 2020/12 (Virtual, 2020) – Quality, conformance, reliability and cost aspects in ISO/TC 67 standards

ISO/TC 67

— thanks Mr Ted Fletcher and Mr Runar Østebø for their presentations about quality, conformance, reliability and cost and the way their working groups can support other working groups and subcommittees;

— encourages its members to liaise with ISO/TC 67/WG 2 when addressing quality and conformance aspects, and with ISO/TC 67/WG 4 when addressing reliability and cost aspects to ensure consistency;

— agrees to organize follow-up sessions for these topics in which also the structuring of and (cross-)references to (future) management (system) standards and related standards will be addressed.
Requirement Writing

ISO TC67
REQUIREMENTS 101
One Requirement at a Time, Please

Individual requirements, one at a time

Each requirement numbered

No long paragraphs

No mixing requirements

https://www.youtube.com/watch?v=PBrNgF5EPOA
Resources to Help

IOGP Writing Guide – Report 604
Video tips via YouTube or IOGP news article
Ask us for help
Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems. An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization. Offshore pipelines shall be isolated from other unprotected or less protected structures, which could drain current from the pipeline's CP system. If isolation is not practical or stray current problems are suspected, electrical continuity should be ensured.

Care shall be taken to ensure that different CP systems of adjacent pipelines or structures are compatible and that no excessive current drains from one system into an adjacent system.
Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems.

An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization.

Offshore pipelines shall be isolated from other unprotected or less protected structures, which could drain current from the pipeline's CP system.

If isolation is not practical or stray current problems are suspected, electrical continuity should be ensured.

Care shall be taken to ensure that different CP systems of adjacent pipelines or structures are compatible and that no excessive current drains from one system into an adjacent system.
How many times do you need to read each requirement to understand?

Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems **shall** be evaluated for adverse interaction between the two systems.

An assessment **shall** be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization.

Offshore pipelines **shall** be isolated from other unprotected or less protected structures, which could drain current from the pipeline's CP system.

If isolation is not practical or stray current problems are suspected, electrical continuity **should** be ensured.

Care **shall** be taken to ensure that different CP systems of adjacent pipelines or structures are compatible and that no excessive current drains from one system into an adjacent system.
Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems.
Can we make it clearer?

Offshore pipelines that are protected by galvanic anodes shall be evaluated for adverse interaction with systems that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems.

An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization.

Offshore pipelines shall be isolated from other unprotected or less protected structures, which could drain current from the pipeline’s CP system.

If isolation is not practical or stray current problems are suspected, electrical continuity should be ensured.

Care shall be taken to ensure that different CP systems for existing and proposed pipelines are not adversely affected by each other.

Note: This includes other pipelines, subsea facilities, structures, and floaters.
Another example – conflict?

Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems.

An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization.

Offshore pipelines shall be isolated from other unprotected or less protected structures, which could drain current from the pipeline's CP system.

If isolation is not practical or stray current problems are suspected, electrical continuity should be ensured.

Care shall be taken to ensure that different CP systems of adjacent pipelines or structures are compatible and that no excessive current drains from one system into an adjacent system.
Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems.

An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization.

Offshore pipelines shall be isolated from other unprotected or less protected structures, which could drain current from the pipeline’s CP system.

If isolation is not practical or stray current problems are suspected, electrical continuity should be ensured.

Offshore pipelines shall be electrically isolated from unprotected or less protected structures that could drain current from the pipeline’s CP system.

If stray current problems are anticipated due to interaction between offshore pipelines and other structures, the electrical continuity of the pipeline system shall be verified.
What is the deliverable?

Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems.

An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization.

Offshore pipelines shall be isolated from other unprotected or less protected structures, which could drain current from the pipeline's CP system. If isolation is not practical or stray current problems are suspected, electrical continuity should be ensured.

Care shall be taken to ensure that different CP systems of adjacent pipelines or structures are compatible and that no excessive current drains from one system into an adjacent system.
What is the deliverable?

**Existing**

Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems.

An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization.

Offshore pipelines shall be isolated from other unprotected or less protected structures, which could drain current from the pipeline’s CP system.

If isolation is not practical or stray current problems are suspected, electrical continuity should be ensured.

Care **shall** be taken to ensure that different CP systems of adjacent pipelines or structures are compatible and that no excessive current drains from one system into an adjacent system.

**Proposed**

Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, subsea facility or floaters that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems.

An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization.

Offshore pipelines shall be isolated from other unprotected or less protected structures, which could drain current from the pipeline’s CP system.

If isolation is not practical or stray current problems are suspected, electrical continuity should be ensured.

CP systems of adjacent pipelines or structures **shall** be verified to be compatible such that current drain from one system into an adjacent system does not exceed the tolerance of either system.
5 General

5.1 Competence assurance

Personnel who undertake the design, supervision of installation, commissioning, supervision of operation, measurements, monitoring and supervision of maintenance of cathodic protection systems shall have the appropriate level of competence for the tasks undertaken.

NOTE 1 EN 1837 or the NACE Cathodic Protection Training and Certification Programme constitute suitable methods that can be used to assess competence of cathodic protection personnel.

NOTE 2 Competence of cathodic protection personnel to the appropriate level for tasks undertaken can be demonstrated by certification in accordance with prequalification procedures such as EN 1837, the NACE Cathodic Protection Training and Certification Programme or any other equivalent systems.

5.2 Compliance

A quality system and an environmental management system should be applied to assist compliance with the requirements of this part of ISO 15589.

NOTE ISO/TS 29001 gives sector-specific guidance on quality management systems and ISO 14001 gives guidance on the selection and use of an environmental management system.

6 Cathodic protection system requirements

6.1 General

The CP system shall be designed to prevent external corrosion over the design life of the pipeline and to:

— provide sufficient current to the pipeline to be protected and distribute this current so that the selected criteria for CP are effectively attained on the entire surface;
— provide a design life of the anode system commensurate with the required life of the protected pipeline, or to provide for periodic rehabilitation of the anode system;
— provide adequate allowance for anticipated changes in current requirements with time;
— ensure that anodes are installed where the possibility of damage or damage is minimal;
— provide adequate monitoring facilities to test and evaluate the system’s performance.

The CP system shall be designed with due regard to environmental conditions and neighbouring structures.

Electrical isolation of offshore pipelines protected by galvanic anodes from other pipelines, structures, platforms or other systems that are protected by impressed-current systems shall be evaluated for adverse interaction between the two systems. An assessment shall be performed to identify the cathodic protection system of these facilities and review the electrical connectivity with the proposed pipeline to ensure no detrimental effects on each side related to inadequate or excessive polarization. Offshore pipelines shall be isolated from other unprotected or less protected structures which could draw current from the pipeline CP system. If isolation is not practical or if stray current problems are suspected, electrical continuity should be ensured.

Care shall be taken to ensure that different CP systems of adjacent pipelines or structures are compatible and that no excessive current drains from one system into an adjacent system.

The pipeline CP design shall take into account the pipeline installation method, the types of pipeline and riser, and the burial and stabilization methods proposed. Further guidance is given in Annex E.
Resources to Help

IOGP Writing Guide – [Report 604](#)
Video tips via [Youtube](#) or [IOGP news article](#)
Ask us for help
ISO/IEC Directives

ISO/IEC Directives, Part 1
Consolidated ISO Supplement — Procedures for the technical work — Procedures specific to ISO

ISO/IEC Directives, Part 2
Principles and rules for the structure and drafting of ISO and IEC documents

The ISO/IEC Directives define the basic procedures to be followed in the development of International Standards and other publications.

Twelfth edition. 2021

Ninth edition. 2021
ISO Webpage – Search functions

ISO 15663:2021
PETROLEUM, PETROCHEMICAL AND NATURAL GAS INDUSTRIES — LIFE CYCLE COSTING

ABSTRACT
This document specifies requirements for and gives guidance on the application of life cycle costing to create value for the development activities and operations associated with drilling, exploitation, processing and transport of petroleum, petrochemical and natural gas resources. This document covers facilities and associated activities within different business categories (upstream, midstream, downstream and petrochemical).

BUY THIS STANDARD

Only informative sections of standards are publicly available. To view the full content, you will need to purchase the standard by clicking on the "Buy" button.
ISO Online Browsing Platform

Example from ISO/TC67/WG4 of how to find definitions of terms in ISO OBP

Economic evaluation measures when comparing competing options:

1. Net present value (NPV)
2. Life cycle cost (LCC)
3. Internal rate of return (IRR)
4. Profitability index (PI)
5. Payback period
6. Break-even volume
7. Break-even price
8. Capital efficiency index (CEI)
4 elements of definitions – example

1. The term itself
   (Possible synonyms and abbreviations and mathematical expressions)
2. The actual definition of the term
3. Examples and Notes to the entry
4. Source and possible modifications

a) ISO 15663 is the ‘owner’ of definition

```
3.1.27
life cycle costing
process of evaluating the difference between the life cycle cost of two or more alternative options

Note 1 to entry: Life cycle costing can involve quantitative and/or qualitative assessment.
```

b) ISO 15663 quoted the source ['owner' of definition]

```
3.1.33
physical breakdown structure
PBS
hierarchical structure of SCCS that defines the types of physical asset components of field Installations being delivered by the activity

Note 1 to entry: Specific physical breakdown structure exists, i.e. SCCS is described in ISO 19008:2016. PBS codes can be found at https://standards.iso.org/iso/19008.

SOURCE: ISO 19008:2016, 3.6, modified — Note 1 to entry has been added.
```

NOTE A: ISO copyright rules require referencing to the defined term (e.g., ISO 15663:2021) when terms, figures, etc. of the standard are being used in other documents.

NOTE B: Consistency and relationships within ISO/TC67 standards portfolio are recommended, to avoid existing terms being redefined in new ISO documents.

NOTE C: Using terms from other standards, and when deleting or renumbering notes it needs to be written, e.g.
   “Notes 2 and 3 to entry have become Notes 1 and 2, new Note 3 to entry has been added”..
- Discovered during ISO 15663 revision process

ISO/IEC Directives, Part 2, 2018

Inconsistency between clauses 22.4 and 20.5, wrt how to refer to clauses in annexes (see below).

22.4 Referencing
Clauses and subclauses do not need to be specifically referred to in the text.
Use, for example, the following forms for references to clauses and subclauses:
- “in accordance with Clause 4”;
- “details as given in 4.1.1”;
- “the requirements given in B.2”;
- “the methods described in 5.3 provide further information on...”.

20.5 Specific principles and rules
Each annex shall be explicitly referred to within the text.

ISO/IEC Directives, Part 2, 2021

Status: Inconsistency between clauses 22.4 and 20.5 has been eliminated [clause 22.4 has been revised].

22.4 Referencing
Use, for example, the following forms for references to clauses and subclauses:
- “in accordance with Clause 4”;
- “details as given in 4.1.1”;
- “the requirements given in B.2”;
- “the methods described in 5.3 provide further information on...”.

20.5 Specific principles and rules
Each annex shall be explicitly referred to within the text.

EXAMPLE
- Annex B provides further information...
- Use the methods described in Annex C
- See Figure A.6
- Clause A.2 describes...
- As specified in C.2.5.

EXAMPLE
- Annex B provides further information...
- Use the methods described in Annex C
- See Figure A.6
- Clause A.2 describes...
- As specified in C.2.5.
Check list for ISO documents

(similiar applies for QA by IOGP Std Solution)

ISO/IEC Directives, Part 2, 2021

Annex A
(informative)

Checklist for writers and editors of documents

The checklist given in Table A.1 is a tool to help writers and editors of documents.

Table A.1 — Checklist for writers and editors of documents

<table>
<thead>
<tr>
<th>Task</th>
<th>Assessment</th>
<th>Done</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WG 4 - Reliability engineering & Technology

Scope

ISO/TC67/WG4 is an active working group in ISO/TC67 that is responsible for reliability and cost related ISO/TC 67 standardization activities within petroleum, petrochemical and natural gas industries. The WG4 membership list consist of experts from the following 14 P-member countries: Australia, Austria, Brazil, Canada, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, UK, and USA.
ISO/TC67/WG4 - Reliability Engineering & Technology
- ISO standards portfolio

- **ISO 14224** “Collection and exchange of reliability and maintenance data for equipment”

- **ISO 20815** “Production assurance and reliability management”

- **ISO/TR 12489** “Reliability modelling and calculation of safety systems”

- **ISO 15663** “Life cycle costing”

- **ISO 19008** “Standard Cost Coding System for oil and gas production and processing facilities”

- **ISO/TS 3250** “Calculation and reporting production efficiency in the operating phase”
  - 1st edition issued August 2021
ISO 20815:2018 - Production assurance terms

Figure G.1 — Illustration of the relationship between some time-based and volume-based production assurance terms
Translation memo of 63 reliability terms in ISO 14224, ISO 20815 and ISO/TR 12489
- See ISO/TC67 N1714


<table>
<thead>
<tr>
<th>English Term (Abbreviation)</th>
<th>References</th>
<th>Finnish</th>
<th>French</th>
<th>Italian</th>
<th>Norwegian</th>
<th>Portuguese</th>
<th>Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. technical availability</td>
<td>ISO 14224:2016, Annex C.2.3.2 + Table E.3</td>
<td>tekninen käytettavuus</td>
<td>disponibilité technique</td>
<td>disponibilità tecnica</td>
<td>teknisk tilgjengelighet</td>
<td>disponibilidade técnica</td>
<td>disponibilidad técnica</td>
</tr>
<tr>
<td>3. operational availability</td>
<td>ISO 14224:2016, Annex C.2.3.2 + Table E.3 IEC 60050-192:2015, 192-08-03</td>
<td>toiminnallinen käytettavuus</td>
<td>disponibilité opérationnelle</td>
<td>disponibilità operativa</td>
<td>operasjonal tilgjengelighet</td>
<td>disponibilidade operacional</td>
<td>disponibilidad operacional</td>
</tr>
<tr>
<td>4. production availability</td>
<td>ISO 20815:2018, 3.1.46</td>
<td>tuotannon maaraan perustava käytettävyys</td>
<td>disponibilité de production</td>
<td>disponibilità di produzione</td>
<td>produksjonstilgjengelighet</td>
<td>disponibilidade de produção</td>
<td>disponibilidad de producción</td>
</tr>
<tr>
<td>5. deliverability</td>
<td>ISO 20815:2018, 3.1.8</td>
<td>toimituskyky</td>
<td>productibilité</td>
<td>erogabilità</td>
<td>leveransetilgjengelighet</td>
<td>capacidade de entrega</td>
<td>capacidad de entrega</td>
</tr>
</tbody>
</table>
# Translation memo of 21 cost terms in ISO 19008:2016 and ISO 15563:2021

- See [ISO/TC67 N1952](https://www.iso.org/standard/68083.html)


<table>
<thead>
<tr>
<th>English Term (Abbreviation)</th>
<th>References</th>
<th>Dutch</th>
<th>Finnish</th>
<th>French</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>20. standard cost coding system (SCCS)</td>
<td>ISO 15663:2021, 3.1.41, ISO 19008:2016, 2.7</td>
<td>standaard kosten coderingsysteem</td>
<td>ohjeellinen kustannuslajjaottelu</td>
<td>système standard de codage des coûts</td>
<td>Standard Kostenkodersystem</td>
</tr>
<tr>
<td>21. weighted average cost of capital (WACC)</td>
<td>ISO 15663:2021, 3.1.46</td>
<td>gewogen gemiddelde kapitaalkosten / financieringenkosten</td>
<td>painotettu keskiarvoinen paassoman kustannus</td>
<td>coût moyen pondéré du capital</td>
<td>Durchschnittskapitalkosten</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>English Term (Abbreviation)</th>
<th>References</th>
<th>Italian</th>
<th>Norwegian</th>
<th>Portuguese</th>
<th>Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. break-even price</td>
<td>ISO 15663:2021, 3.1.4</td>
<td>prezzo di pareggio</td>
<td>balansepris</td>
<td>preço de equilíbrio</td>
<td>precio de equilíbrio</td>
</tr>
</tbody>
</table>
ISO 15663:2021 – "Life Cycle Costing"
- Life cycle phases

<table>
<thead>
<tr>
<th>Id.</th>
<th>Life cycle phase</th>
<th>Phase outcome/ delivery</th>
<th>Phase outcome/ delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Explore</td>
<td>Identified business opportunities</td>
<td>Identified business opportunities</td>
</tr>
<tr>
<td>1</td>
<td>Appraise</td>
<td>Feasible installation concept(s)</td>
<td>Feasible solution(s)</td>
</tr>
<tr>
<td>2</td>
<td>Select</td>
<td>A selected (preferred) installation concept</td>
<td>A selected (preferred) solution</td>
</tr>
<tr>
<td>3</td>
<td>Define</td>
<td>A defined (matured) installation concept for final investment decision (FID)</td>
<td>A defined (matured) solution for final investment decision (FID)</td>
</tr>
<tr>
<td>4</td>
<td>Execute</td>
<td>The installation is ready to start production/operation</td>
<td>The solution has been installed and is ready to start production/operation</td>
</tr>
<tr>
<td>5</td>
<td>Operate</td>
<td>End of installation operating life</td>
<td>End of (modified) installation operating life</td>
</tr>
<tr>
<td>6</td>
<td>Abandon</td>
<td>The facility has been removed and disposed</td>
<td>The facility has been removed and disposed</td>
</tr>
</tbody>
</table>

NOTE 1 Facility owner/operating company can be oil company, rig owner, etc.

NOTE 2 The life cycle phases are defined for the purpose of this document and further sub-division is given in Figure B.1.
Example of referencing to ISO/TC67/WG4 standards
- In ISO 17349:2016 and in ISO 29001:2020

ISO 29001:2020(E)

7.1.3.2 For service-related infrastructure, the documented information shall also address:
— usage history, repairs or redress, modifications, remanufacturing, inspection, and test activities that allow direct verification for reuse of infrastructure;
— list of critical spare parts required by the customer and/or technical requirements including those recommended by the original equipment manufacturer.

7.1.3.3 The organization can apply risk-based maintenance, which typically includes the concepts of:
— preventive and predictive maintenance;
— reliability centred maintenance;
— mean time between failures;
— system, design and process failure mode and effects analysis;
— failure mode and criticality effects analysis;
— process control plans; and
— others that are in context of the organization and its risks.

NOTE IEC 61010 provides general guidance on selection and application of systematic techniques for risk assessment. Sector-specific guidance can be found in ISO 14226, which provides a comprehensive basis for the collection of reliability and maintenance data in a standard format for equipment in all facilities and operations within the petroleum, natural gas and petrochemical industries during the operational life cycle of equipment. Sector-specific guidance can also be found in ISO 20815, which describes the concept of the process of production assurance and reliability management within the systems and operations associated with exploration drilling, exploitation, processing and transport of petroleum, petrochemical and natural gas resources.
WG 2 - Operating integrity management

Scope

Provide requirements, guidance and tools to support organisations within the petroleum, petrochemical and natural gas industries in establishing and implementing management, quality and conformity assessment processes to reduce operating risk and drive improvement throughout their business.
ISO/TC67/WG2 – Operating Integrity Management

50 Members from 15 Countries
ISO/TC67 liaison organization representatives
- API
- IADC
- IOGP
- IPECA
- Energy Institute

5 published standards
4 Standards under development
- Operating Management system (OMS)
- OMS Maturity Assessment Scheme
- Conformity Assessment Scheme
- ISO/TR 13881 Revision

Roadmap 2025 – Creating added value standards to manage risk and drive improvement
We have developed our Roadmap 2025 by reviewing our existing standards portfolio and discussing new projects to support the sector in managing risks and opportunities and improving performance.

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- ISO/TR 13881 Revision

We work under IGCF Standards Committee (discussion and development). We are a potential new standard for OMS.

Check out our ISO/TC67 WG2 website (scan QR code) and join our LinkedIn Group "Operating integrity management for oil and gas sector."
ISO 29001 a short history

➢ Initially issued in 2003 as a technical report

➢ Last update was in 2010 to reflect the changes within ISO 9001:2008.

➢ From 2010 became much more widely accepted to be applied across:
  ➢ facilities design and construction;
  ➢ specialised engineered equipment and services;
  ➢ general suppliers of products and services

➢ Up until 2013 was co-branded with API Q1.

➢ ISO 9001:2015 introduced a step change to the way that Quality Management Systems are to be implemented across all industries

➢ ISO 29001:2020 published with national adoptions progressing

➢ Complementary conformity assessment standard (ISO 29012) under development
Quality requirements drafting principles

ISO/IEC Directives
Part 2 Clause 33
Aspects of conformity assessment

CASCO Website

Do’s and don’ts
CASCO toolbox

TERMS AND DEFINITION
ISO/IEC 17000

CONFORMITY ASSESSMENT OF SUPPLIERS
ISO/IEC 17050-1
ISO/IEC 17050-2

PEER ASSESSMENT
ISO/IEC 17040

REQUIREMENT FOR ACCREDITATION BODIES
ISO/IEC 17011

MUTUAL RECOGNITION
ISO/IEC Guide 68

CODE OF GOOD PRACTICE
ISO/IEC GUIDE 60

TESTING BODIES
ISO/IEC 17020

INSPECTION BODIES

CERTIFICATION BODIES

VALIDATION / VERIFICATION BODIES
ISO/IEC 17029

TESTING & CALIBRATION LABORATORIES
ISO/IEC 17025

PROFICIENCY TESTING
ISO/IEC 17043

MANAGEMENT SYSTEMS
ISO/IEC 17021-1
ISO/IEC TS 17021-2 to 12
ISO/IEC TS 17023

PERSONS
ISO/IEC 17024

PRODUCTS, PROCESSES & SERVICES
ISO/IEC 17065
ISO/IEC 17067
Conformity assessment is …

➢ ... the activities we complete to determine whether a product or service meets specific requirements (usually contained in a standard)

**definition**

➢ the demonstration that specified requirements relating to a product, process, system, person or body are fulfilled

Note ISO rules regarding use of "compliance":
“comply/compliance” can only be used when referring to the law. For all other cases, please use “conform/conformance/conformity”.

ISO
Key words......

If any of these words appear in your draft, there may be conformity assessment implications:

- accreditation
- approval
- auditing
- calibration
- certificate
- certification
- conformity
- conformity assessment bodies
- conformity assessment
- declaration
- evaluation
- validation/verification

CASCO checks for these by default as part of the editing process.
Conformity assessment roles and records

Object

Test done by:

1st party
(the manufacturer, service provider)

2nd party
(the purchaser, the client)

3rd party - independent
(certification body, laboratory, inspection body...)

Attestation type

SDoC
(Self Declaration of Conformity)

Contract

Certificate

3rd party bodies can be accredited. Accreditation bodies are assessed by their peers
Quality management system requirements

ISO and API rules preclude:

• Specific “shall” requirements calling up conformance with specific QMS Standards

• Use of compliance other than in respect to the law

Examples from
API 5L - Linepipe
ISO 12490 - Actuators

5 Compliance to this Specification

5.1 Quality

A documented quality system shall be applied to assist compliance with the requirements of this specification.

NOTE 1 Documentation of a quality system does not require certification by a third party certification body; only the creation or adoption of a written quality system is necessary to meet the requirement of this standard; API defers to the expertise of responsible quality management personnel to create or adopt the system which best reflects the need of each company.

NOTE 2 There are many existing quality management systems to which personnel can refer to for guidance in the development of an appropriate quality system, including ISO/TS 29001\(^2\) and API Q\(^1\)\(^3\), which contain provisions specific to the oil and gas industry, or ISO 9001\(^4\), which contains general requirements for quality management systems that are auditable. This list is not exhaustive and is provided for information only.

A contract can specify that the manufacturer shall be responsible for complying with all of the applicable requirements of this specification, which may include terms for it to be permissible for the purchaser to

2.3 Compliance with this International Standard

A quality system should be applied to assist compliance with the requirements of this International Standard.

NOTE ISO/TS 29001 gives sector-specific guidance on quality management systems.

The manufacturer shall be responsible for complying with all of the applicable requirements of this International Standard. It shall be permissible for the purchaser to make any investigation necessary in order to be assured of compliance by the manufacturer and to reject any material that does not comply.
Quality management system requirements

Current Practice

5.2 Compliance

A quality system should be applied to assist compliance with the requirements of this [standard name].

Note: ISO TS 29001 gives sector-specific guidance on quality management systems.

Conforming Practice

5.2 Conformance

A quality management system shall be applied to ensure and demonstrate conformance with this [standard name].

Note: [ISO 29001 and API Specification Q1] define acceptable sector-specific quality management system requirements.
Regulatory compliance requirements

**Current Practice**

ISO 16440
"Consideration may be given to applying cathodic protection to the casing as required by conditions or regulations. Cathodic protection design shall be in accordance with approved industry standards, such as ISO 15589-1."

**Conforming Practice**

ISO 16440
If cathodic protection of the casing is required, the CP design shall conform with ISO 15589-1.  
Note: Local regulations or local conditions might impose requirements for cathodic protection."
Verifiable requirements – ISO 12490 (current)

**Current practice**

10.1 Material specification

Specifications for metallic pressure-containing parts shall be issued by the manufacturer and shall address, as a minimum, the following:

a) material type and grade (e.g. carbon steel, austenitic stainless steel, ferritic ductile iron, non-ferrous alloys, etc.);

b) product form;

c) chemical composition;

d) condition/heat treatment;

e) mechanical properties;

f) Charpy impacts, if applicable;

g) type of inspection document in accordance with ISO 10474 or EN 10204.

**Recommended practice**

10.1 Material specification

The Manufacturer shall specify metallic and non-metallic materials for the specified environmental conditions, service and durability, refer 10.2

Material specifications for metallic, pressure-containing parts and springs shall include:

a) material type and grade (e.g. carbon steel, austenitic stainless steel, ferritic ductile iron, non-ferrous alloys, etc.);

b) product form;

c) chemical composition;

d) condition/heat treatment;

e) mechanical properties;

f) impact properties, if applicable;

g) type of inspection document in accordance with ISO 10474 or EN 10204.

Table 6 specifies minimum material requirements for pneumatic/hydraulic actuator components.

Table 7 specifies minimum material requirements for electric actuator components.

Tables 6 and 7 specify minimum material requirements for electro-hydraulic actuator components.

The manufacturer can specify alternate materials or material and surface protection combinations that provide equivalent performance for the specified environment, service and duration.

**Note:** Atmospheric corrosivity will be specified in accordance with ISO12944-2 or through nomination of the applicable atmospheric parameters and service fluids and process parameters. Durability will be specified in accordance with ISO12944-1.
Verification of technical requirements

‘Quality “control” requirement’ : Requirement that seeks to confirm, through the provision of objective evidence, that “technical” requirements have been met.

For example:

"""A static overload test shall be carried out of the assembled crane at its final location, before the crane is taken into use for the first time. The test points shall be as follows:
1) maximum rated capacity (R0 or Rn) at its maximum radius;
2) the load /radius that gives the maximum overturning moment.
These test points are illustrated in Figure 7.
Test point 2 is to be determined by the crane designer.
The test loads are to be in accordance with 6.2.5.
The static overload test shall be determined from all configuration(s), e.g. boom length, reeving arrangement, such that the interface between crane and foundation is utilised to the maximum load regarding all load curves."
Summary and way forward

• Requirements drafting
  • Clear requirements, one at a time
  • Know Directives and use the ISO tools that help - OBP

• WG4. Key messages to benefit from existing reliability and cost standards
  • Terminology for various terms for appropriate use also in other standards
  • Multi-disciplinary analysis techniques that can be quoted as needed

• WG2. Key messages to promote standardisation of:
  • “Quality” conformance management requirements
  • Verifiable technical requirements and
  • Verification (inspection testing etc.) activities against technical requirements

What is your reflection on how you will take this forward in your project teams?

Thank you! Further questions welcomed
Read more about the use of standards and its purpose at https://committee.iso.org/home/tc67