



Updated and latest news from international standardization

*International ISO standardization seminar for
the reliability technology and cost area.
Statoil Business Centre, Stavanger,
26 April 2016*

Runar Østebø, Advisor, Statoil
ISO/TC 67/WG4 Convenor

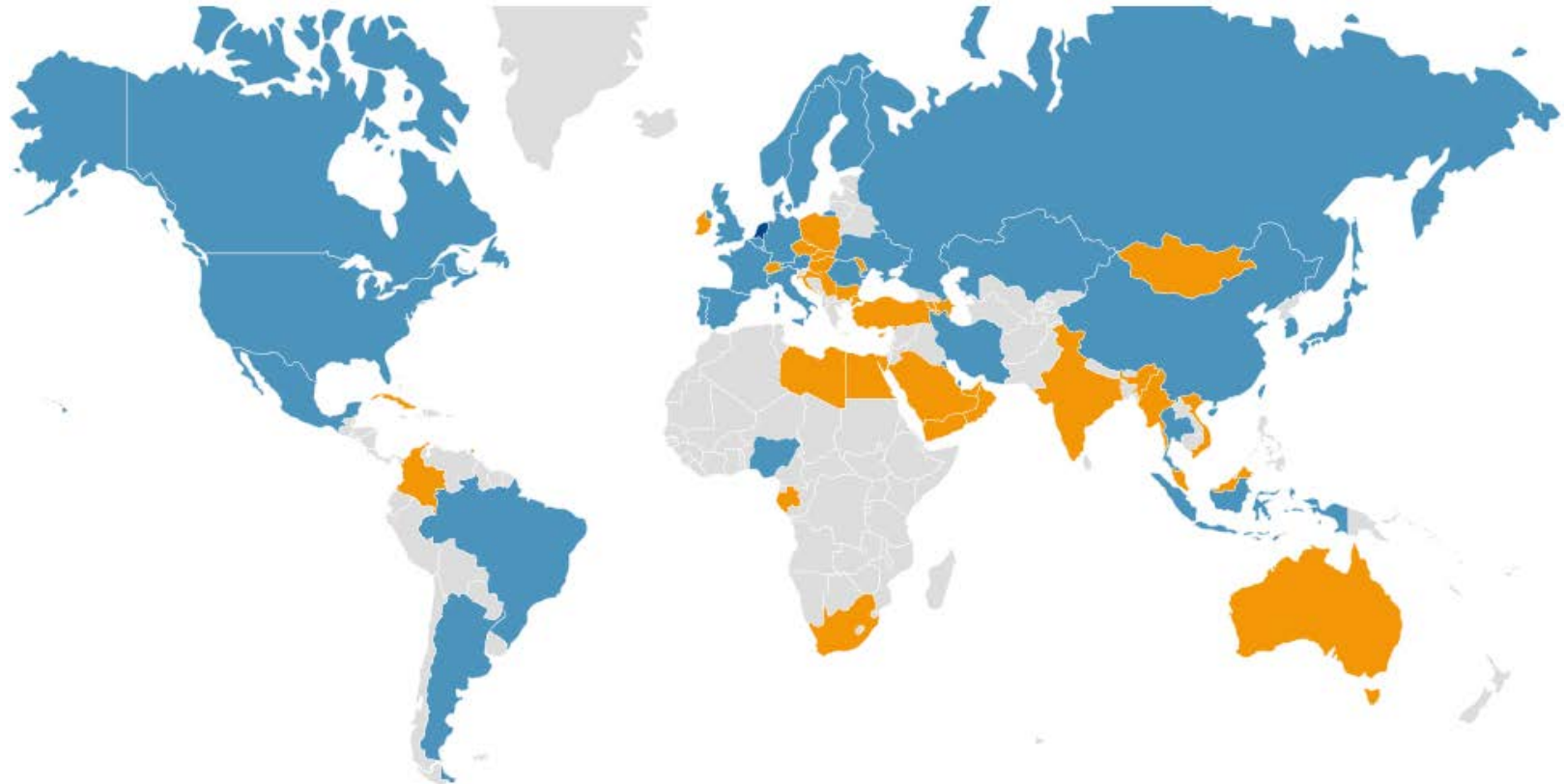
Scope of ISO/TC 67

- *Title: Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*
- *Scope: Standardization of the materials, equipment and offshore structures used in the drilling, production, transport by pipelines and processing of liquid and gaseous hydrocarbons within the*
 - *petroleum, petrochemical and natural gas industries*
- *Excluded: Aspects of offshore structures subject to IMO regulations (ISO/TC 8 – Ships and marine technology)*

ISO Mission: To create value-added standards for the oil and gas industry

ISO/TC67 Vision: Global standards used locally worldwide

ISO/TC 67 members



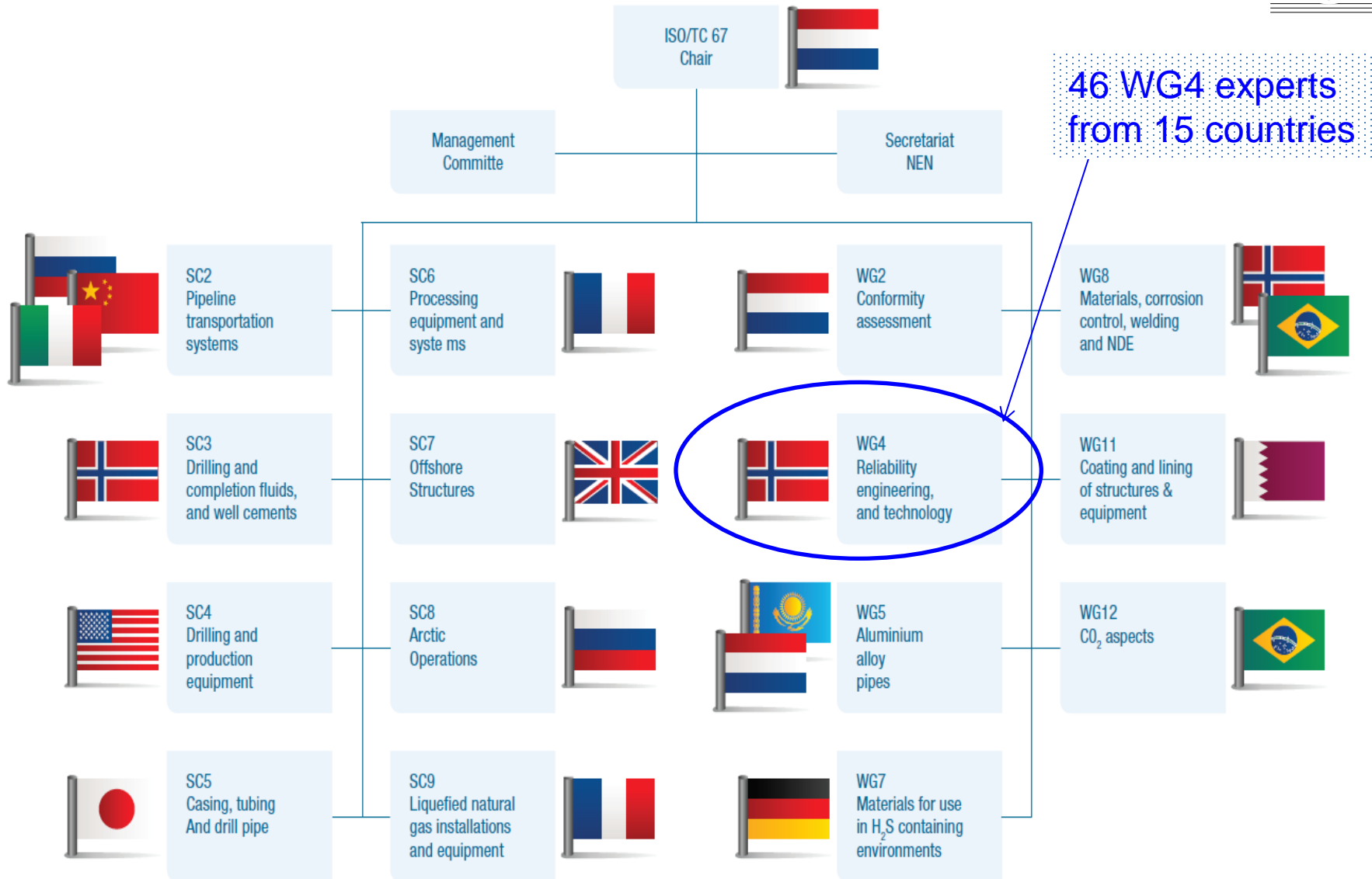
P (Participating) members – 33 .. (WG4 involvement – 17)

Argentina, Austria, Bahrain, **Belgium, Brazil, Canada, China, Denmark, Finland, France, Germany**, Indonesia, Iran, **Italy**, Japan, **Kazakhstan**, Republic of Korea, Kuwait, Luxembourg, Mexico, **Netherlands (S), Nigeria, Norway**, Portugal, Qatar, Romania, Russian Federation, **Spain**, Sweden, Thailand, **Ukraine, United Kingdom, United States**.

O (Observing) Members – 33

Armenia, Australia, Azerbaijan, Bulgaria, Colombia, Croatia, Cuba, Cyprus, Czech Republic, Ecuador, Egypt, Gabon, Hong Kong, Hungary, India, Ireland, Libya, Malaysia, Republic of Moldova, Mongolia, Myanmar, Oman, Poland, Saudi Arabia, Serbia, Singapore, Slovakia, South Africa, Switzerland, Trinidad and Tobago, Turkey, United Arab Emirates, Vietnam, Yemen.

ISO/TC 67 organization



Global standardization arena



Governance framework wrt. business arena



• Regulations

- E.g. Norway: Petroleum Safety Agency (PSA) and NPD
- Other regulators in each country
- International Regulators Forum (IRF)



• Standardization

- International standards
 - ISO, IEC
- Regional standards
 - CEN,..
- National standards
 - NS, BS, ANSI,..
- Industry standards
 - NORSOK, API,..

Associations:

- * International Oil and Gas Producers (IOGP)
- * Norwegian Oil and Gas

• Company requirements

(functional & technical)

- HSE
- Systems/Equipment
- Project development
- Operation and maintenance



ISO/TC 67 challenges

IOGP Standards Solution

IOGP, the International Association of Oil and Gas Producers, host technical work of ISO/TC 67 under Association auspices and in accordance with trade regulations, including observing complete confidentiality.

IOGP Standards Solution builds on ISO/IEC Directives and IOGP's liaison status with ISO/TC 67 and aims at progressing the technical work on drafts that will be balloted and published by ISO as ISO standards.

To date, 48 drafts have been submitted to ISO/TC 67 for balloting (including ISO/TR 12489, ISO 14224 and ISO 19008), of which 27 have been published by ISO (including ISO/TR 12489).

ISO/TC 67/WG 4 - Reliability Engineering & Technology

ISO standards – Project Groups

Projects (active projects currently organized via IOGP Standards Solution)

- **PG1: ISO 14224** *“Collection and exchange of reliability and maintenance data for equipment”*
 - 2nd edition issued Dec 2006. FDIS version 21 April 2016, and final 3rd edition planned to come in 2016 (Q2/Q3 2016).
- **PG2: ISO 20815** *“Production assurance and reliability management”*
 - 1st edition issued June 2008; corrected version in June 2009. New revision process started in 2016 and new 2nd edition planned for in 2018.
- **PG3: ISO/TR 12489** *“Reliability modelling and calculation of safety systems”*
 - 1st edition issued Nov 2013. Course held in Stavanger 25-26 April 2016.
- **PG4: ISO 15663-1/2/3** *“Life cycle costing”*
 - 1st editions issued 2000/2001. No current revision plan, but relations exist to the other standards.
- **PG5: ISO 19008** *“Standard Cost Coding System for oil and gas production and processing facilities”*
 - DIS version issued in June 2015. FDIS version to come end April 2016, and final new edition to come in 2016 (Q2/Q3 2016).

ISO/TC 67/WG 4 - Reliability Engineering & Technology

Responsibilities and organization



- **Responsibility & mandate** in «Petroleum, petrochemical and natural gas industries»
 - *Responsible for reliability and cost related ISO/TC 67 standardization activities*
- **Convenor**
 - Runar Østebø, Statoil, Norway
- **Secretary:**
 - Anne Gunn Rike, Standards Norway
- **Project group leaders (active project groups):**
 - *PG1 & PG2: Runar Østebø, Jon Selvik, IRIS, Norway (technical editor)*
 - PG3: Jean Pierre Signoret, Total, France (project leader & editor during development);
Stephane Collas, Total (now interim project leader)
 - *PG5: Rune Hellem, Statoil, Norway (also technical editor)*
- **Liaison officers** (informal) between ISO/TC67/WG4 and IEC/TC56



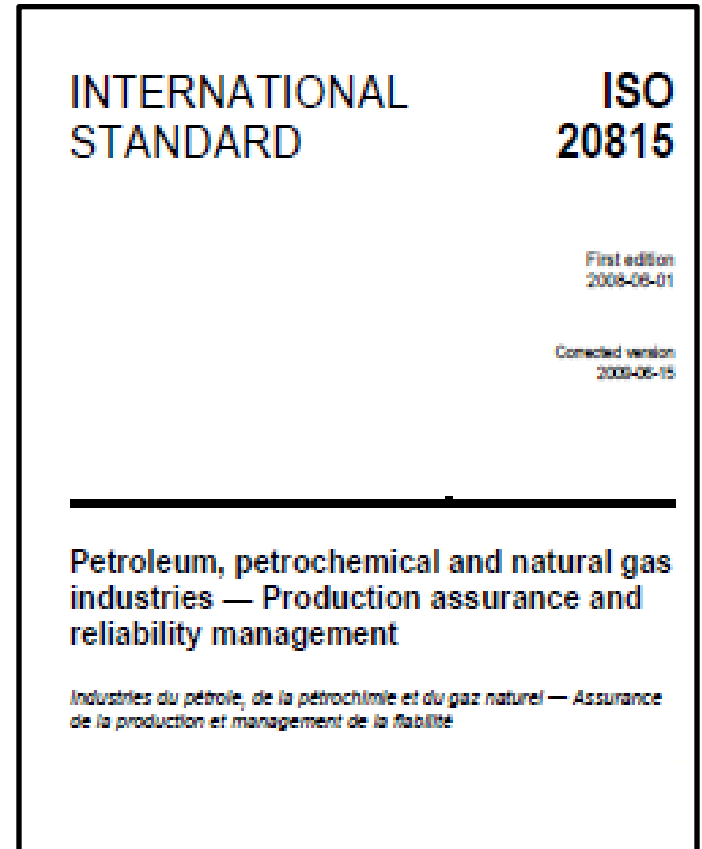


ISO 20815

“Production assurance and reliability management”

- **Scope**
 - Describe **analysis principles and work processes**
 - Provide key definitions
 - Basis for production assurance in **all life-cycle phases**
 - Applicable for all type of oil & gas facilities and operations
 - **Production assurance programme (PAP)**
 - Overview and outline of techniques

CEN version approved February 2010: EN ISO 20815
Adopted as Norwegian standard June 2010: NS-EN ISO 20815:2010
French version issued in June 2010: NF EN ISO 20815. *Industries du pétrole, de la pétrochimie et du gaz naturel – Assurance de la production et management de la fiabilité.*
Portuguese version planned to come in 2016.



NS-EN ISO 20815:2010 quoted also in PSA (see e.g. Maintenance programme in [Activity Regulations - § 47](#)).

Production assurance terms (Regularitetsbegreper)

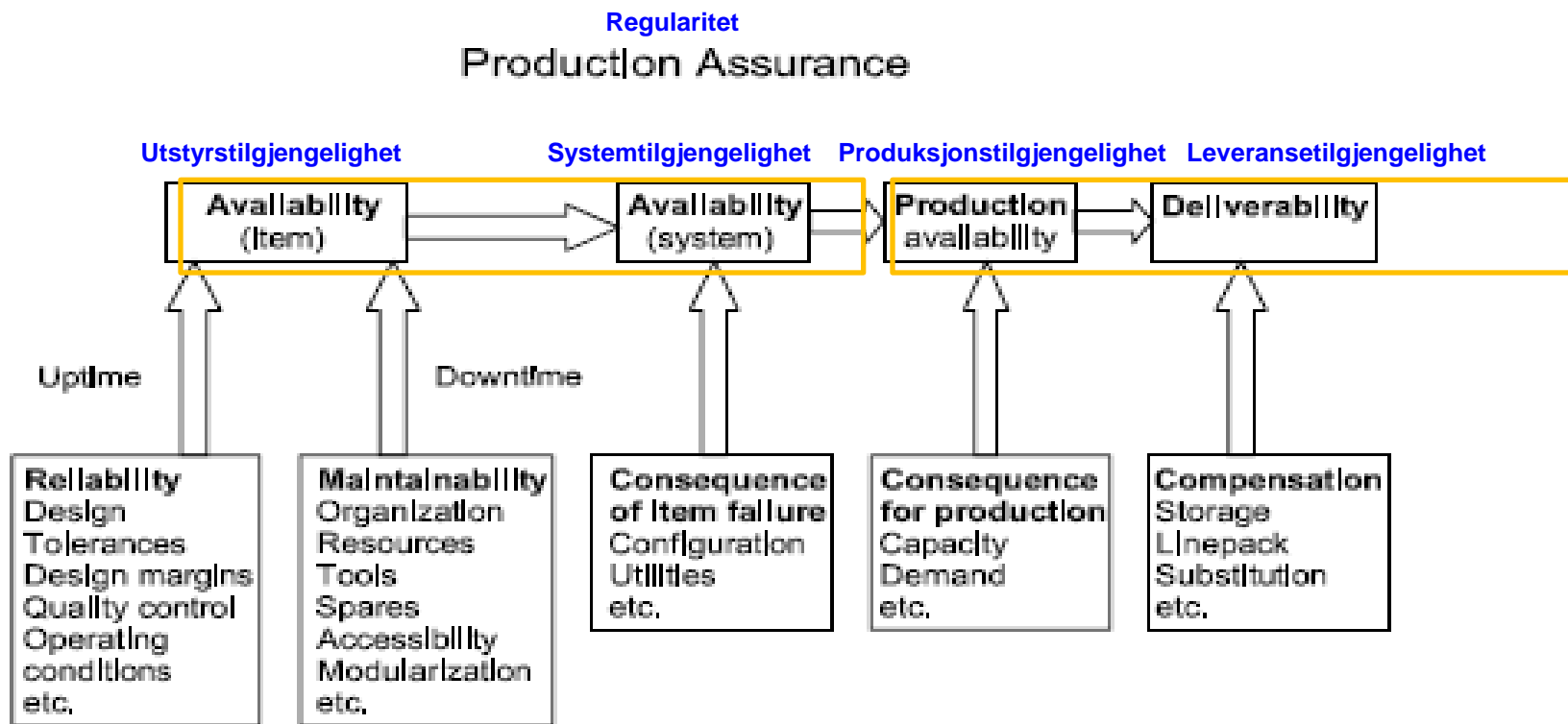


Figure G.1 — Illustration of the relationship between some production-assurance terms

Source: ISO 20815:2009

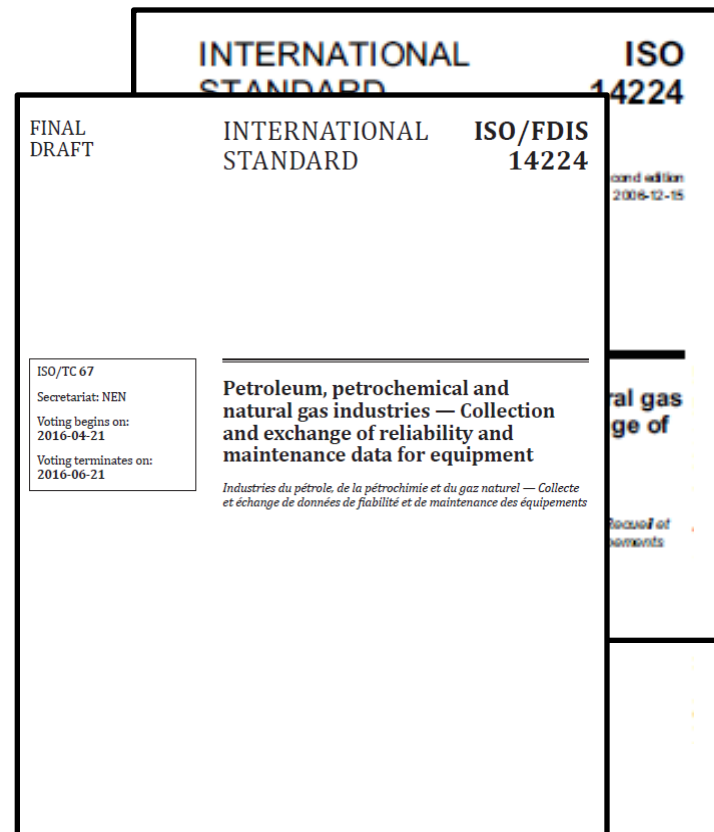
Note: the word regularity shall NOT be used!



ISO 14224

”Collection and exchange of reliability and maintenance data for equipment”

- *Scope*
 - Data collection principles for reliability and maintenance (RM) data
 - Provide key definitions
 - Basis for communicating equipment experience «reliability esperanto»
 - Normative terminology e.g.
 - **Failure modes (per equipment class)**
 - **Failure mechanism and failure cause (generic across all equipment classes)**
 - **Key Performance Indicators (KPI), also for safety equipment**
 - Applicable for all type of oil & gas facilities and operations.
 - Also covering failures for safety systems (Annex F)



CEN version approved December 2006: EN ISO 14224
Adopted as Norwegian standard April 2007: NS-EN ISO 14224:2006
French version issued in June 2012: NF EN ISO 14224 *Industries du pétrole naturel — Recueil et échange de données de fiabilité et de maintenance des équipements*
Portuguese version issued Oct 2011: ABNT NBR ISO 14224 *Indústrias de petróleo, petroquímicas e de gás natural — Coleta e intercâmbio de dados de confiabilidade e de manutenção dos equipamentos*

NS-EN ISO 14224:2006 quoted also in PSA (see e.g. failure and maintenance data in [Activity Regulations - § 49](#)).

ISO/FDIS 14224 – Equipment across value chain



Focus on production and safety critical equipment

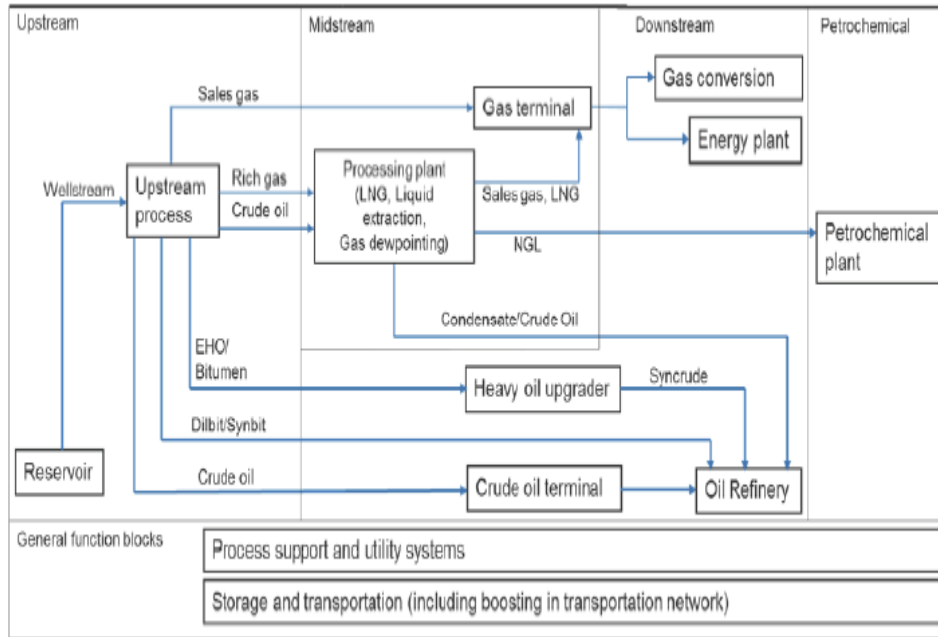


Figure A.1 – Process technology function blocks in the oil and gas value chain — Level 3

- 97 systems (Level 5)
- 108 equipment classes (Level 6)
 - 46 addressed on level 6-8. 14 new!
- 60 key failure modes for all equipment

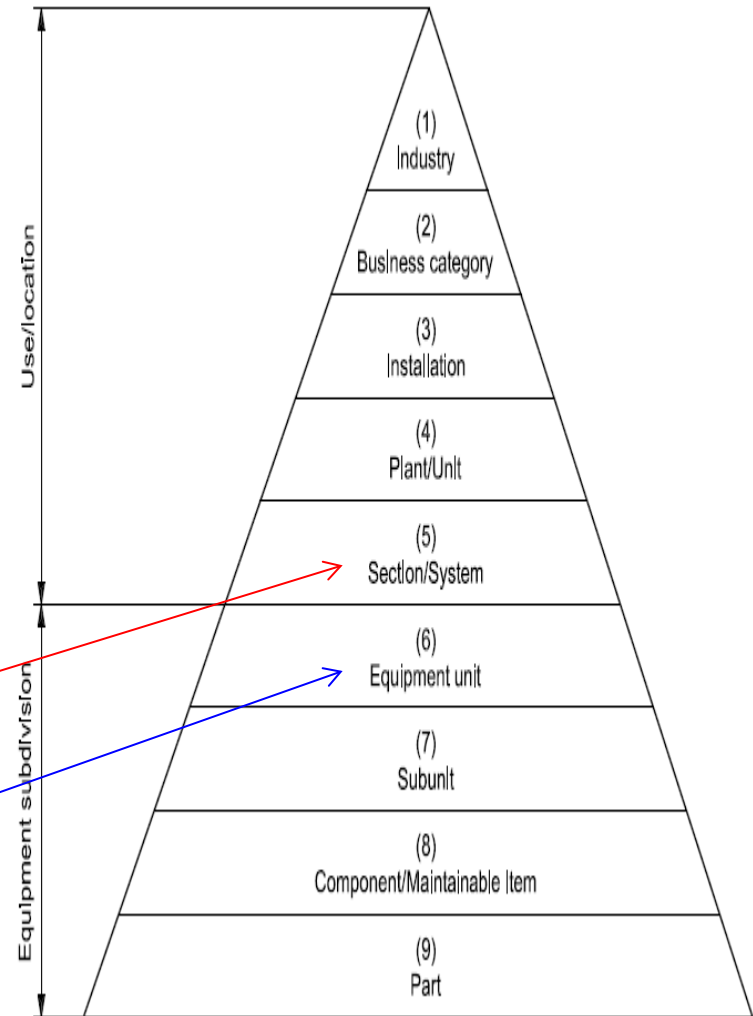
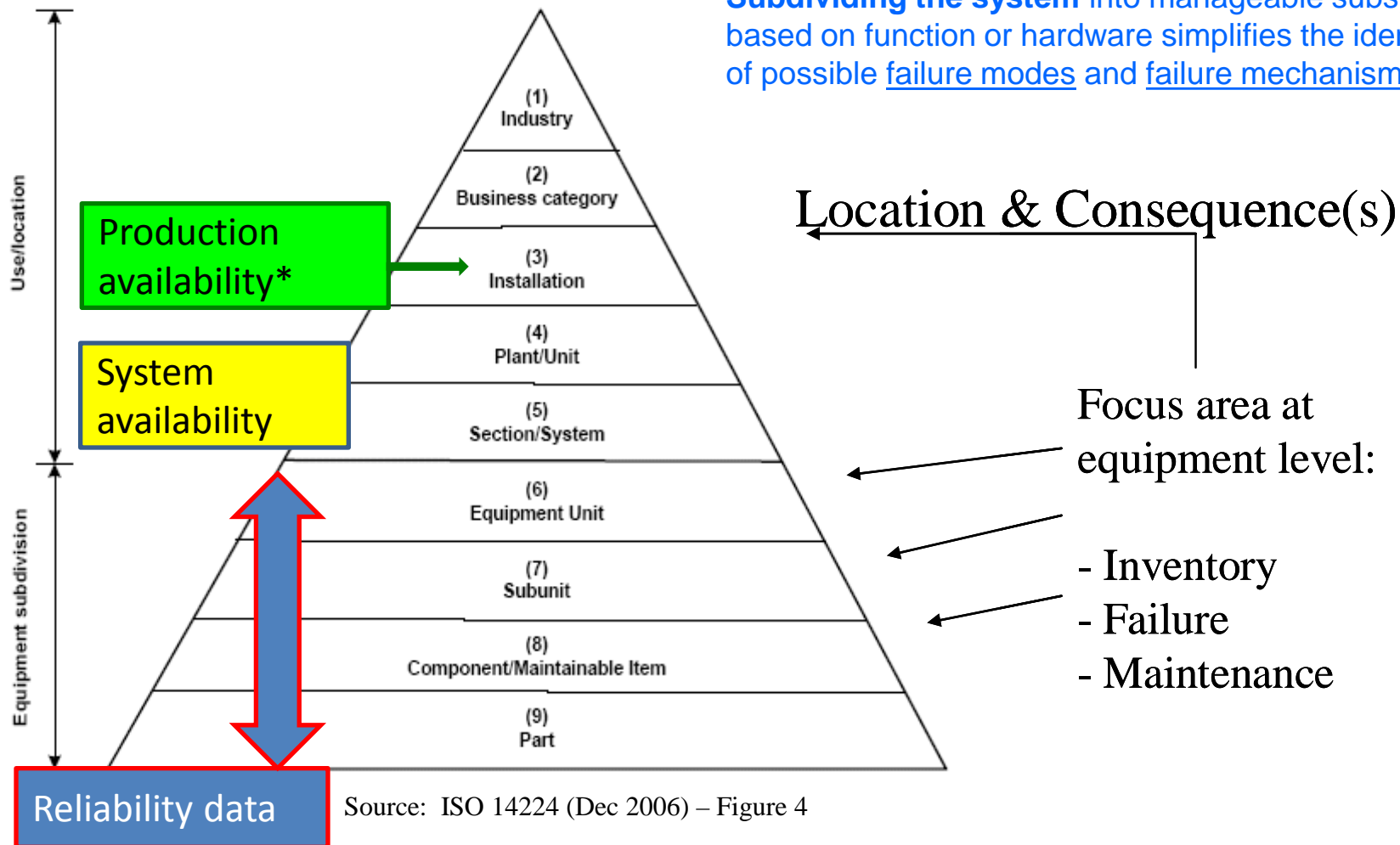


Figure 3 – Taxonomy classification with taxonomic levels

ISO 14224 - Taxonomy classification

System sub-division, also for CMMIS & LCI usage

Subdividing the system into manageable subsystems, based on function or hardware simplifies the identification of possible failure modes and failure mechanisms.



*In operation often called Production efficiency (PE)

ISO Technical Report 12489

”Reliability modelling and calculation of safety systems”

- *Scope*

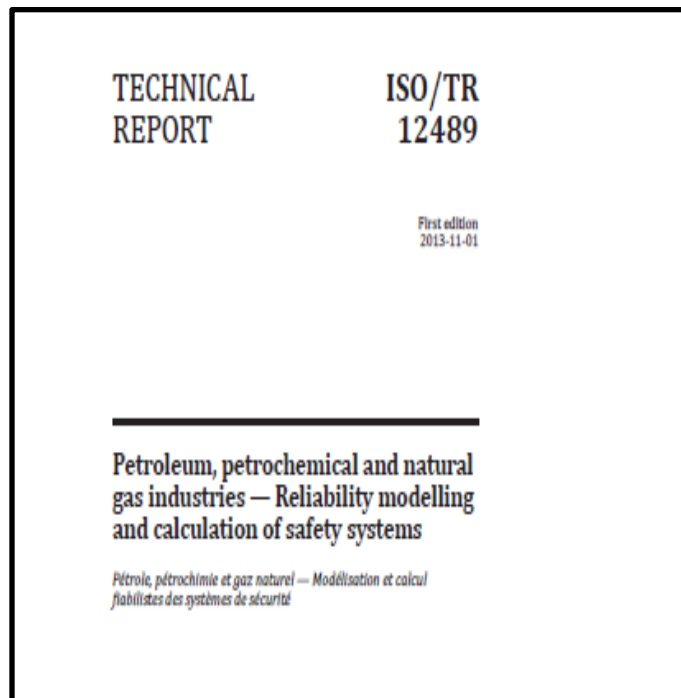
- Provide guidelines with focus on modelling & calculations
- ISO/TR 12489 is an important supplement of IEC 61508-part 6 (functional safety), but for all safety systems
- Priority 2 issue on ISO/TC 67 ”Action plan industry events” (Montara/Macondo)

CEN version approved March 2015 and issued Jan 2016:

CEN ISO/TR 12489

Adopted as Norwegian technical report Jan 2016:

Issued as CEN ISO /TR 12489:2016 (Norwegian front page)



Teknisk rapport
CEN ISO/TR 12489:2016

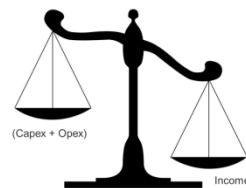
ICS 75.180.01; 75.200
Språk: Engelsk

Petroleumsindustri, petrokjemisk industri
og naturgassindustri
Pålitelighetsmodellering og beregning av
sikkerhetssystem
(ISO/TR 12489:2013)

Petroleum, petrochemical and natural gas industries
Reliability modelling and calculation of safety systems
(ISO/TR 12489:2013)

Concluding remarks

- Use of (invested) oil & gas international standardization is an industrial responsibility - for equipment and work processes
 - To reduce risk (safety and environment)
 - To save cost by controlling variety
 - To minimize company own specifications
 - Capture standardized learnings
- Correct compliant use of ISO standards can unlock necessary business value and is a means to achieve cost-efficiency, HSE objectives, and also minimize climate impact.





Thank you for your attention!

ISO Mission: To create value-added standards for the oil and gas industry

ISO Vision: Global standards used locally worldwide

WG4 Objective : Develop and maintain relevant
reliability and cost standards