

**ISO 20815
Production Assurance
and
Reliability Management**

Informasjonsmøte, 25.5.2009

StatoilHydro, Stavanger



Agenda



0930 – 1000 Registrering, kaffe

1000 – 1015 Åpning, velkommen, Henrik Kortner, DNV

1015 – 1100 Generell presentasjon av standarden, Henrik Kortner, DNV

1100 – 1145 Regularitetsstyringsprogram, Harald Hamran, Lilleaker Consulting

1145 – 1230 Lunsj

1230 – 1315 Mål for produksjonstilgjengelighet, Runar Østebø, StatoilHydro

1315 – 1400 Regularitetsanalyser, Atle Stokke, DNV

1400 – 1430 Kaffe

1430 – 1515 Innsamling og analyse av pålitelighetsdata, Runar Østebø, StatoilHydro

1515 – 1545 Oppsummering, avslutning, Henrik Kortner, DNV



ISO 20815

Petroleum, petrochemical and natural gas industries

Production Assurance and Reliability Management

Introduction to the standard

by

Henrik Kortner

Det Norske Veritas



ISO

International Organization for Standardization



- **Technical Committee, TC 67**
Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries
- **Working Group, WG 4**
Reliability Engineering and Technology
- **Project Groups, PG 1,2 and 3**



ISO/TC 67/WG 4

Reliability Engineering and Technology



- **PG1 - ISO 14224**
Collection and Exchange of Reliability and Maintenance Data for Equipment
- **PG2 - ISO 20815**
Production Assurance and Reliability Management
- **PG3 – Technical Report**
Reliability modelling and calculation of safety systems



Time schedule ISO 20815



- **Based on NORSOK Z-016**
- **CD** **July 2005**
- **DIS** **August 2006**
- **FDIS** **October 2007**
- **IS** **June 2008**



Members PG 2

- **Convenor:** **Henrik Kortner, DNV, Norway**
- **Runar Østebø, Statoil, Norway**

- **Technical editor:** **Knut E. Haugen, Vetco, Norway**

- **Secretary:** **Stein Østerlie, Standard Norge, Norway**

- **Leif E. Sunde, FMC, Norway**
- **Elin Wirum, Statoil, Norway**
- **Steve Burchell, BP, UK**
- **Bahram Khaligh, Kellogg, UK**
- **Jean-Pierre Signoret, Total, France**
- **Nilo de Moura Jorge, Petrobras, Brazil**
- **Joseph Thorpe, Aramco, USA**
- **Johannes van de Voorst, Shell, The Netherlands**



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Rationale



- **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 ISO 20815, 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.**



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Scope



- **ISO 20815 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. ISO 20815 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.**



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Process Approach



- **ISO 20815 designates 12 processes, of which seven are defined as core production-assurance processes and addressed in the standard. The remaining five processes are denoted as interacting processes and are outside the scope of the standard. The interaction of the core production-assurance processes with these interacting processes, however, is within the scope of ISO 20815 as the information flow to and from these latter processes is required to ensure that production-assurance requirements can be fulfilled.**
- **ISO 20815 recommends that the listed processes and activities be initiated only if they can be considered to add value.**
- **The only requirements mandated by ISO 20815 are the establishment and execution of the production-assurance programme (PAP).**



Franz Kafka

Der Prozess, 1925



Det kommer ganske visst tunge stunder, slik alle jo har, hvor man ikke tror å ha oppnådd det minste, hvor det ser ut som bare de prosesser som helt fra begynnelsen av var forutbestemt for en god utgang også fikk en lykkelig slutt, slik det ville ha skjedd også uten bistand, mens alle de andre gikk tapt på tross av alt man løp ved siden av og fulgte med, tross alle anstrengelser, tross alle de små tilsynelatende suksesser, som man hadde så stor glede av. Da er man ganske visst ikke lenger sikker på noe og man vil på direkte spørsmål ikke engang våge å benekte at man nettopp med sin bistand har bragt prosesser som ifølge sitt vesen var i god gjenge, på avveie.



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Annexes (informative)



- **A: Contents of production-assurance programme (PAP)**
- **B: Core production-assurance processes and activities**
- **C: Interacting production-assurance processes and activities**
- **D: Production-performance analyses**
- **E: Reliability and production-performance data**
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- **G: Performance measures for production availability**
- **H: Catastrophic events**
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Production Assurance and Decision Support



The objective associated with systematic production assurance is to contribute to the alignment of design and operational decisions with corporate and business objectives



Optimisation Process



The main principle for optimisation of design or selection between alternative design solutions is economic optimisation within given constraints and framework conditions. The achievement of high performance is of limited importance unless the associated costs are considered.

Ref. ISO 15663



Production Assurance Programme (PAP)



- **A production assurance programme, PAP, shall serve as a management tool in the process of complying with ISO 20815.**
- **As production assurance is a continuous activity throughout all life cycle phases, it shall be updated as and when required.**
- **The establishment and execution of the production-assurance programme is the only mandatory requirement in ISO 20815**



Project risk categorisation



High, medium, low risk based on:

- **Operating envelope**
- **Technical system scale and complexity**
- **Organisational scale and complexity**



Production assurance processes for asset development				Life Cycle Phase						
				Pre contract award		Post contract award				
Low Risk Projects	Medium Risk Projects	High Risk Projects	Main Processes	Feasibility	Conceptual Design	Engineering	Procurement	Fabrication/Assembly/Testing	Installation and Commissioning	Operation
					X	X	1. Production Assurance Requirements	X	X	X
X	X	X	2. Production Assurance Planning	X	X	X	X	X	X	X
	X	X	3. Design and Manufacture for Production Assurance		X	X		X	X	X
X	X	X	4. Production Assurance	X	X	X	X	X	X	X
	X	X	5. Risk and Reliability Analysis	X	X	X				
X	X	X	6. Verification and Validation	X	X	X				
X	X	X	7. Project Risk Management	X	X	X	X	X	X	X
		X	8. Qualification and testing		X	X	X	X		
X	X	X	9. Performance Data Tracking and Analysis						X	X
		X	10. Supply Chain Management				X			
X	X	X	11. Management of Change		X	X	X	X	X	X
X	X	X	12. Organisational learning	X	X	X	X	X	X	X



Alternative standards

Compliance with ISO 20815 can partly be achieved via compliance with other standards, for instance:

- **IEC 60300: Dependability Management**
- **API 17N: Reliability and technical risk management**
- **DNV-RP-A203: Qualification procedures for new technology**



ISO 20815 versus API RP 17N



- **Close co-operation between the two standardization committees**
- **Key processes aligned between the two standards**
- **API RP 17N more prescriptive and detailed than ISO 20815**
 - **API focused on subsea only**
 - **API is a recommended practice – hence more focused on providing guidance on methodologies**
- **API RP 17N:**

“Projects implemented in compliance with ISO 20815 may be considered compliant with this RP. However, the lower level of detail in ISO 20815 may result in the omission of some API recommended activities in this RP”
- **ISO 20815:**

“Table 3 shows how the production-assurance and reliability processes described within this International Standard link to some of these standards. Work processes carried out in accordance with these standards can be considered to also satisfy the requirements for relevant processes in this International Standard.”



Core Production Assurance Processes



Production assurance processes

