PETROBRAS

International Organization for Standardization

ASSOCIAÇÃO BRASILEIRA DE NORMAS TÉCNICAS

**International standardization in the reliability engineering & technology arena**

# *Use and practices/translations of ISO 14224 and ISO 20815 in Brazil*

**Guilherme da Silva Telles Naegeli, M.Sc. – PETROBRAS - CENPES**


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INTERNATIONAL STANDARD
ISO 14224
Second edition
2006-12-15
Petroleum, petrochemical and natural gas industries — Collection and exchange of reliability and maintenance data for equipment
Industries du pétrole, de la pétrochimie et du gaz naturel — Recueil et échange de données de fiabilité et de maintenance des équipements
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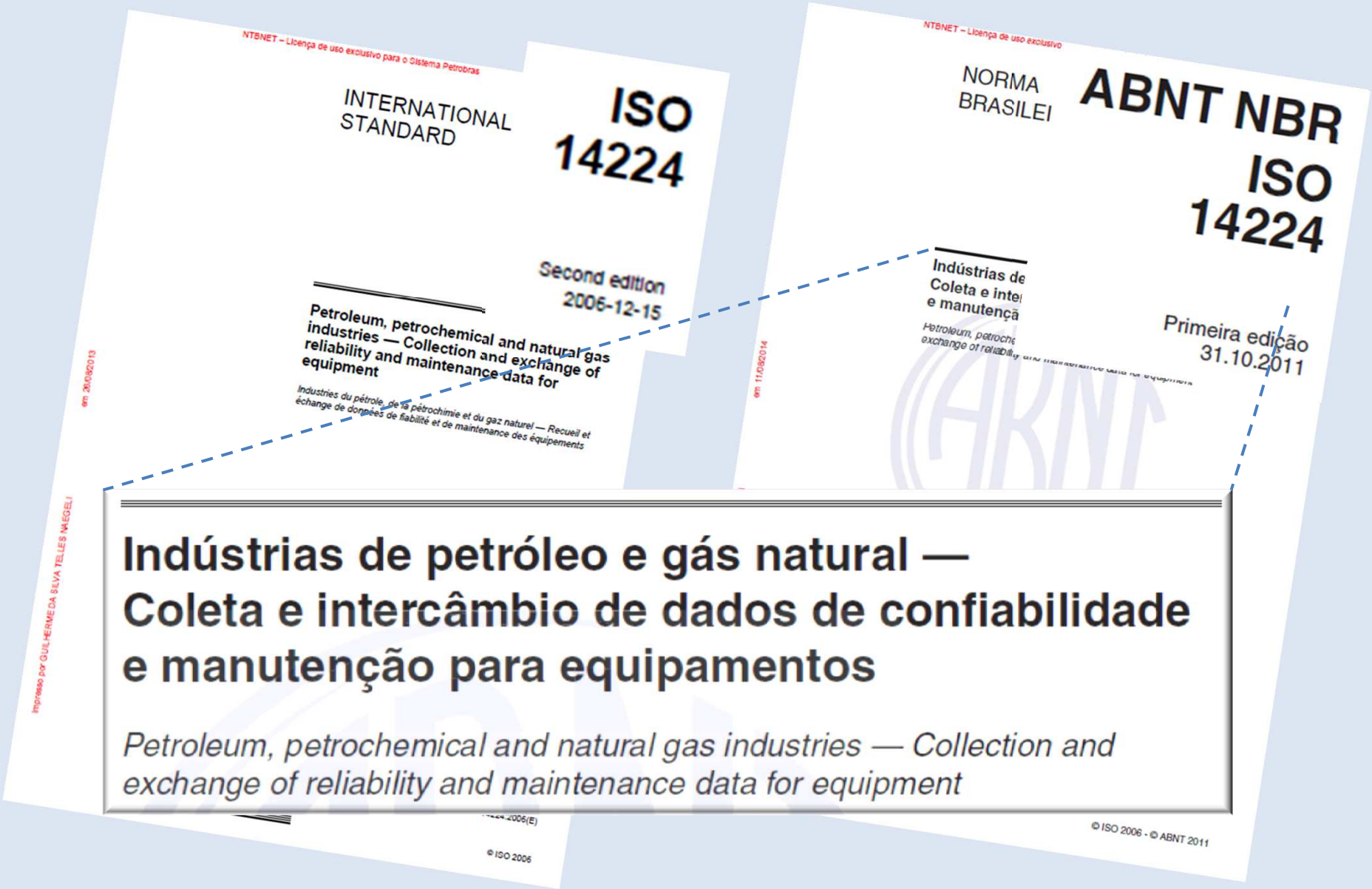
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Petroleum, petrochemical and natural gas industries — Collection and exchange of reliability and maintenance data for equipment

ABNT/CB-ABNT/CB-50
PROJETO 50:000.04-003
JUNHO: 2011

# Indústrias de petróleo e gás natural - Coleta e intercâmbio de dados de confiabilidade e manutenção para equipamentos

## APRESENTAÇÃO

**1)** Este 1º Projeto foi elaborado pela Comissão de Estudo de Equipamentos de Perfuração e Produção (CE-50:000.04) do Comitê Brasileiro de Materiais, Equipamentos e Estruturas Oceânicas para a Indústria do Petróleo e Gás Natural (ABNT/CB-50), nas reuniões de:

| | | |
|---|---|---|
| 29/08/2008 | 30/09/2008 | 10/11/2008 |
| 06/02/2009 | 06/03/2009 | 30/03/2009 |
| 08/05/2009 | 08/06/2009 | 08/07/2009 |
| 03/08/2009 | 04/09/2009 | 25/09/2009 |
| 06/10/2009 | 16/10/2009 | 03/11/2009 |
| 17/11/2009 | 22/12/2009 | 01/02/2010 |
| 04/03/2010 | 31/03/2010 | 06/05/2010 |
| 27/05/2010 | 24/02/2011 | ---------- |

| | |
|---|---|
| DNV | Joaquim Domingues |
| FMC Technologies | Alexandre Cobo |
| Petrobras | Carlos Frederico Guimarães Robbs<br>Everton Nogueira Lima<br>Francisco Gilberto Erthal Risi<br>Gilsa Pacheco Monteiro<br>Guilherme da Silva Telles Naegeli<br>Humberto Santana Moreira<br>Laércio Bezerra da Rocha Filho<br>Luciana Farias Horlle<br>Maria Fernanda Alves Soares<br>Marino Benamor Muratore<br>Mario Marcondes Machado<br>Nilo de Moura Jorge<br>Paulo Cezar Correa Defelippe<br>Ricardo Yoshinori Okada<br>Salvador Simões Filho |
| RELIA SOFT | Eduardo Seixas |
| UFPE – Universidade Federal de Pernambuco | Márcio Moura |
| White Martins | Merildo Crivella<br>Roldão Bandeira |

**Work Group**

ABNT/CB-ABNT/CB-50
PROJETO 50:000.04-003

## Basic Assumption:

This Brazilian Standard is an adoption from the ISO 14224: 2006, **identical in technical content, structure and composition.**

## Improvements in the original International Standard?

| 1 | 2 | (3) | 4 | 5 | (6) | (7) |
|---|---|---|---|---|---|---|
| **MB**[1] | **Clause No./ Subclause No./ Annex** (e.g. 3.1) | **Paragraph/ Figure/Table/ Note** (e.g. Table 1) | **Type of com-ment**[2] | **Comment (justification for change) by the MB** | **Proposed change by the MB** | **Secretariat observations** on each comment submitted |
| BR | | | | | | |
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Form to send comments to ISO

1 **MB** = Member body (enter the ISO 3166 two-letter country code, e.g. CN for China; comments from the ISO/CS editing unit are identified by **)
2 **Type of comment:** **ge** = general **te** = technical **ed** = editorial
**NOTE** Columns 1, 2, 4, 5 are compulsory.

*ISO electronic balloting commenting template/version 2001-10*

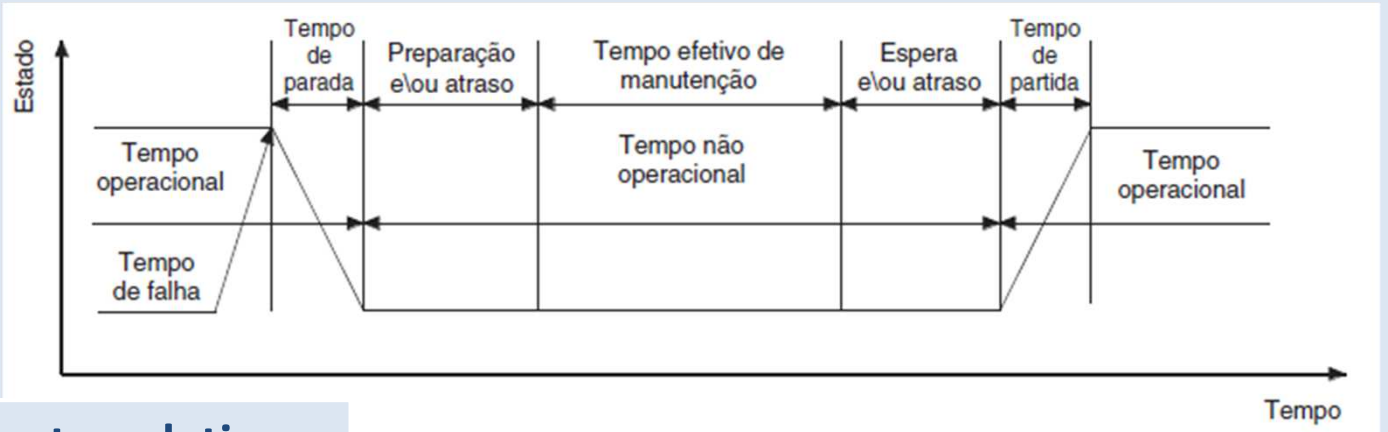


Figura 4 – Tempos de manutenção

## Difficulties in some translations:

**3.10**
**down time**
time interval during which an item is in a down state

**3.10**
**tempo não operacional** (*down time*)
intervalo de tempo durante o qual um item se encontra no estado não operacional (*down state*)

**3.51**
**up time**
time interval during which an item is in an up state

**3.51**
**tempo operacional** (*up time*)
intervalo de tempo durante o qual um item encontra-se em estado operacional

# ISO 14224 – Contents

1. Scope
2. Normative references
3. Terms and definitions
4. Abbreviated terms
5. Application
6. Benefits of RM data collection and exchange
7. Quality of data
8. Equipment boundary, taxonomy and time definitions
9. Recommended data for equipment, failures and maintenance

# ISO 14224 – Annexes

Annex A (informative) Equipment-class attributes

Annex B **(normative)** Interpretation and notation of failure and maintenance parameters

Annex C (informative) Guide to interpretation and calculation of derived reliability and maintenance parameters

Annex D (informative) Typical requirements for data

Annex E (informative) Key performance indicators (KPIs) and benchmarking

Annex F (informative) Classification and definition of safety-critical failures

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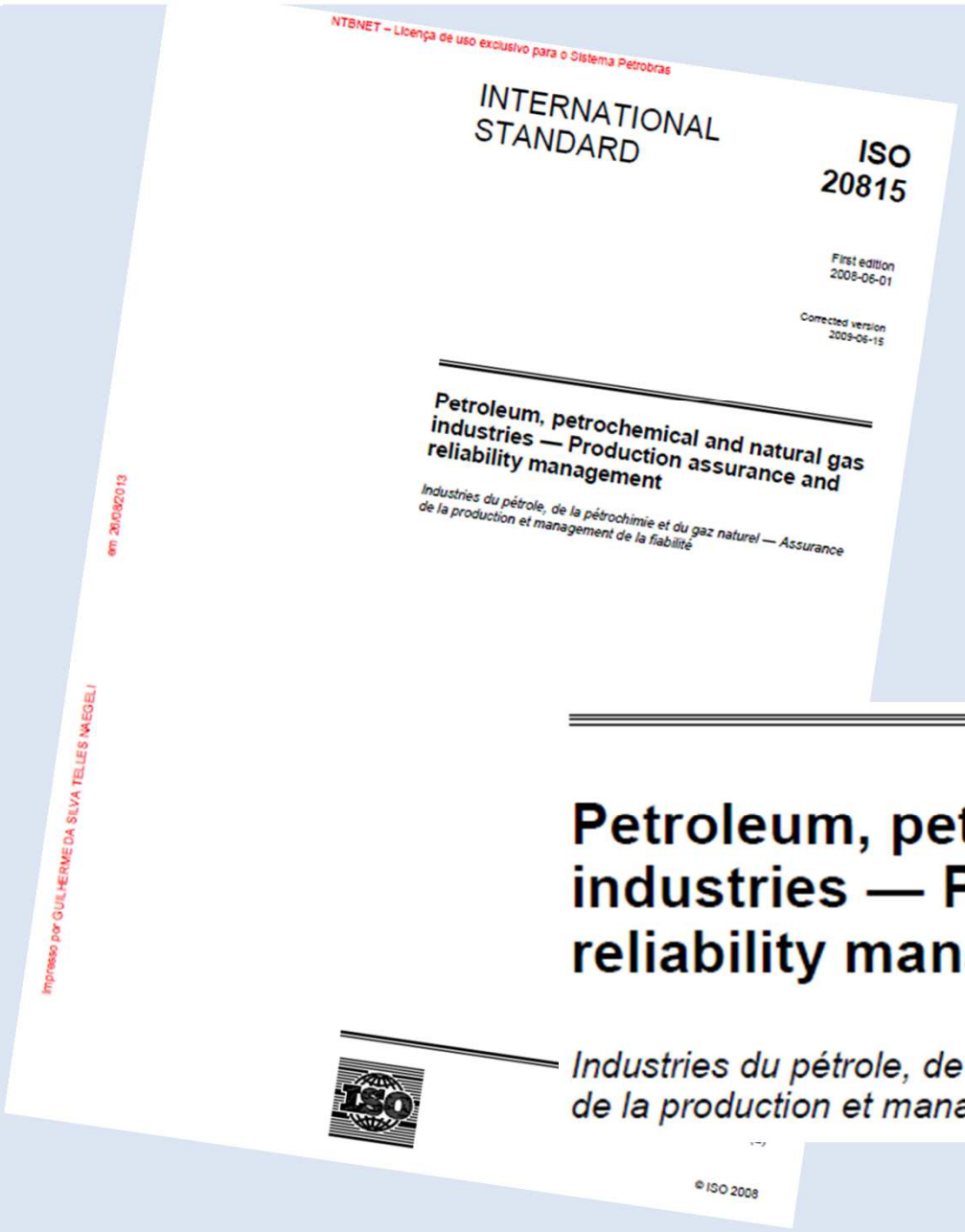



INTERNATIONAL STANDARD

ISO 20815

First edition 2008-06-01

Corrected version 2009-06-15

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*





# ISO 20815

First edition
2008-06-01

Corrected version
2009-06-15

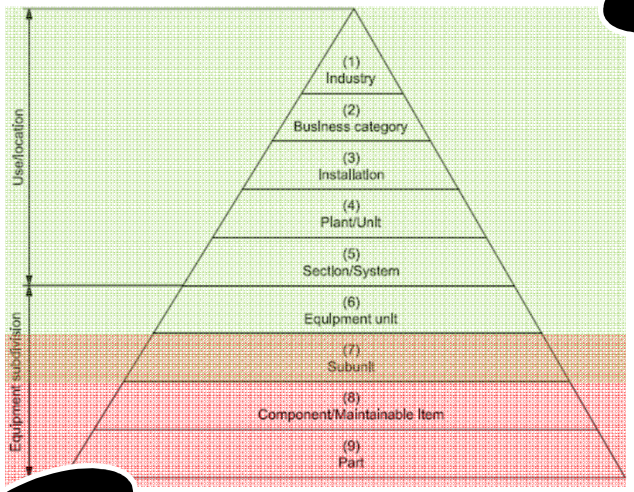
# Petroleum, petrochemical and natural gas industries — Production assurance and reliability management

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

# ISO 20815 – Contents

# ISO-14224 and NORSOK Z-008 – Uses on DW/RE

**Application of standardized hierarchical framework and asset review on CMMS (SAP)**




Done

CDT
VDT
CCF
DCK
HDT
HGU

| | |
|---|---|
| Before review | 265.951 |
| **After review** | **254.366** |
| **New** | **50.589 (19%)** |
| **Excluded** | **63.654 (24%)** |

Doing now

**Other Process and Utilities**

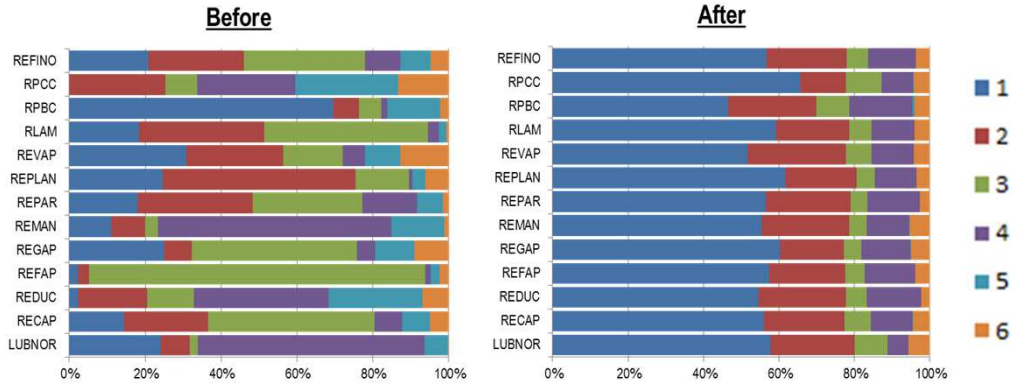
**Bill of Material**

Near future

**Asset Criticality review (NORSOK Z-008)**

Done

CDT
VDT
CCF
DCK
HDT
HGU




Doing now

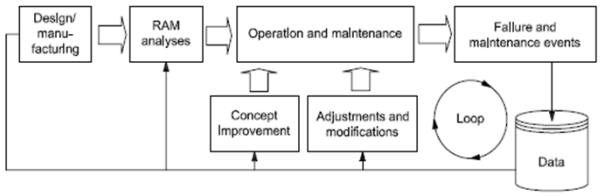
**Other Process and Utilities**

**Results**

**Improved Scheduling Prioritization** ✓

**Safety-critical Equipment identified** ✓

**Improved Asset Performance Monitoring** ✓




**Continual Improvement**

# Production Assurance & Reliability Management

**Denise Faertes, PhD**

Senior Consultant
E&P-CORP/PROM/GIOp – 3 de outubro de 2014

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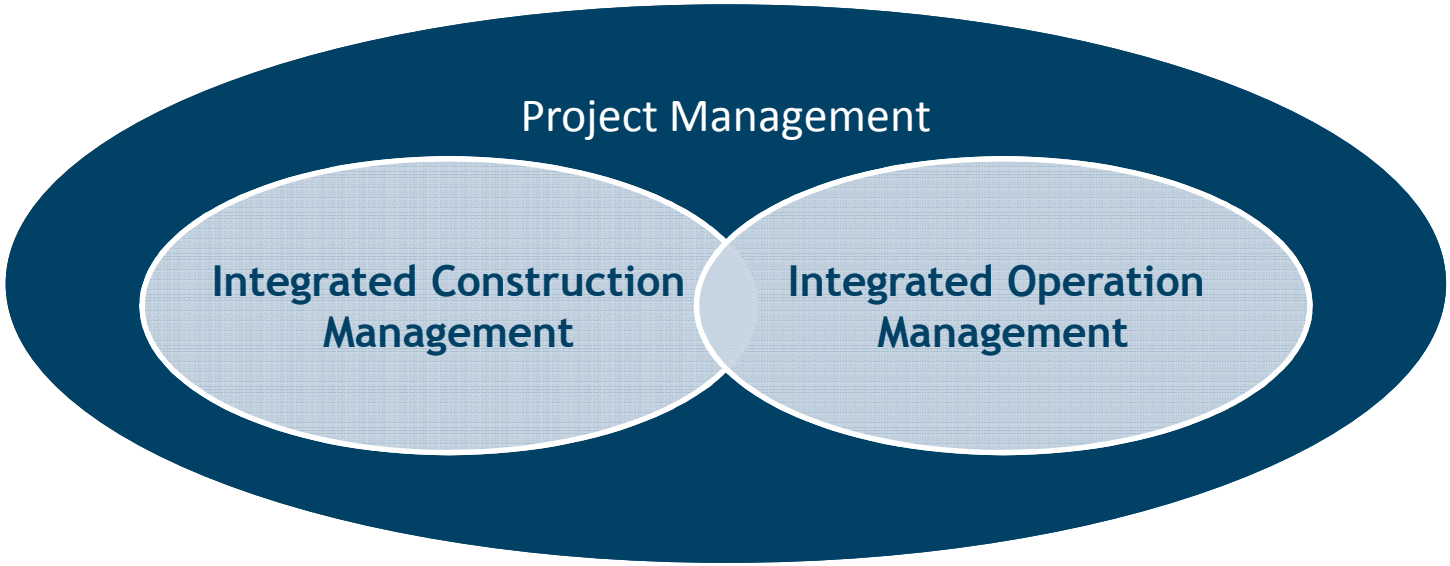
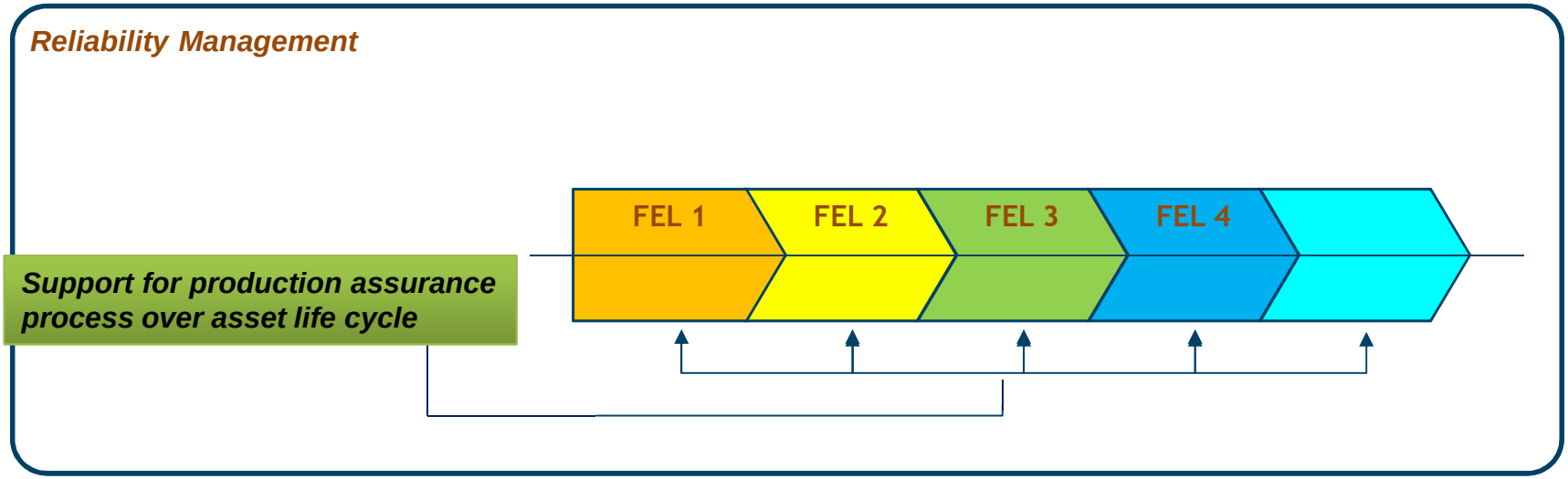
# Reliability Management over Asset Life Cycle



# Production Assurance & Reliability Management

*'Reliability goals and metrics tie together all stages of asset life cycle'*

*'...Well crafted goals provide the target for the business to achieve, they set the direction...'*

*"Metrics provide the milestones, "the are we there, yet"- the feed-back all elements of the organization need to stay on track towards the goals"*

Dick Moss
Former HP Corporate Product Reliability Manager and
Winner of the CEO´s Customer Satisfaction Award

# Production Assurance & Reliability Management

| | FEL 3 | OBS |
|---|---|---|
| ***Inputs*** | o *Time period to be considered*<br>o *Scope/Boundaries Definitions – supply chain/units/systems (evaluate interdependencies)*<br>o *Production x demand profiles*<br>o *Design configuration*<br>o *Production/Reliability goals (from previous design phases)*<br>o *Review technological risks*<br>o *Shedding prioritisation*<br>o *Environmental/regulatory constraints/issues*<br>o *Operational flexibility/contingency plans*<br>o *Data collection and treatment;*<br>o *Maintenance/Inspection/Logistics/Spare parts Strategies*<br>o *Costs*<br>o *Learning Lessons* | |
| ***Outputs*** | o *RAM modelling*<br>o *FMECAs*<br>o *KPIs – Production Efficiency, Availability, Frequency of failures and their compliance with intended production goals;*<br>o *Identification of critical systems/equipment for production losses and failure frequencies falhas (*) (**)* | |

***BUILDING***

# Production Assurance & Reliability Management

| | FEL 3 | OBS |
|---|---|---|
| *Outputs (cont.)* | o *Performance /Reliability goals /requirements – critical systems/subsystems/equipment (*) (**);*<br>o *Evaluation of Maintenance/Logistics/spare parts strategies (*) (**)*<br>o *Investmentes Prioritisation –Cost xBenefits Analysisi*<br>o *RCM studies (*) (**)(***)*<br>o *Maintenance sgoals/strategies/tasks/test intervals (*) (**) (***)*<br>o *Spare patrts list (capital spare e operational spare(*) (**) (***)*<br>o *Contingency plans*<br>o *Environmental constraints ('flaring')*<br>o *Learning lessons* | |
| **NOTES** | | |
| (*) | *'feed-back' from operational performance* | |
| (**) | *Consider FMECAs, specially when using new technologies (high risk)* | |
| (***) | *Consider reliability requirements from RAM studies* | |
| (****) | *Require from supply chain - Spare parts in compliance with Petrobras/SAP/PM e MM* | |

*BUILDING*

# OBRIGADA!

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# Questions?

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**http://www.abrisco2014.com.br/**

SEMINÁRIO 2014

# abrisco

**24 de novembro de 2014**
**Clube de Engenharia - Rio de Janeiro**

## Palestras:

- Gestão Integrada de Operações na Área de E&P
- Regulamentação com Informação do Risco (risk-informed regulations)
- Realidade Virtual e Ambientes de Imersão em Segurança e Confiabilidade
- Produção de Petróleo com Alto Teor de $CO_2$

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- Risco e Confiabilidade em Instrumentação e Controle Digital
- Implicações das Novas Regulamentações de Segurança NRs, ANP e outras

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