



MANAGING RISK

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A Global Overview of Offshore Oil & Gas Asset Integrity Issues



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- The EVOLUTION of Offshore O&G Asset Integrity
- General issues in the industry today
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What is Asset Integrity?

Asset Integrity (AI): Definition

AI is a continuous process of knowledge and experience applied throughout the lifecycle to manage the risk of failures and events in design, construction, and during operation of facilities to ensure optimal production without compromising safety, health and environmental requirements

Design Integrity – “Assure design for safe operations”

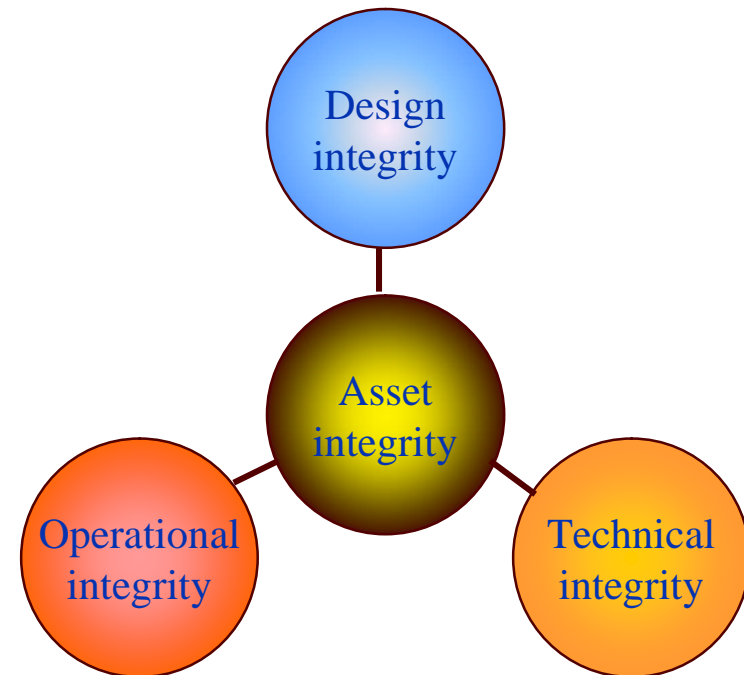
Assurance that facilities are designed in accordance with governing standards and meet specified operating requirements

Technical Integrity – “Keep it in”

Appropriate work processes for Maintenance & inspection systems and data mgt. to keep the operations available

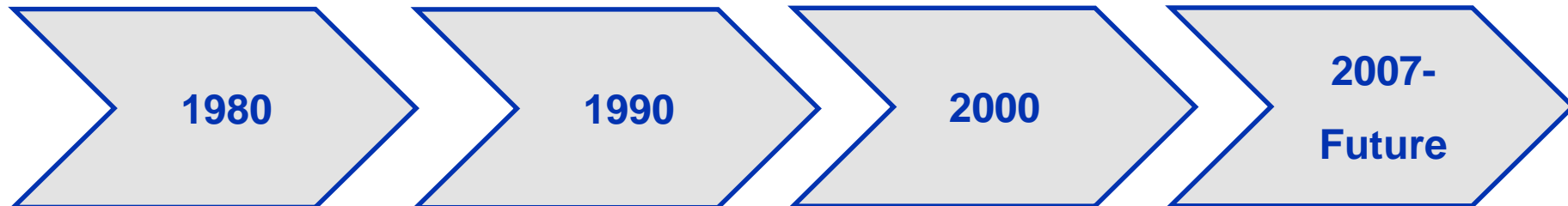
Operational Integrity – “Keep it Running”

Appropriate knowledge, experience, manning, competence and decision making data to operate the plant as intended throughout its lifecycle



The EVOLUTION of Offshore O&G Asset Integrity

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Prescriptive rules
and regulations

Certification &
Verification

Reporting of
events

Inspection data
collection

Experienced
based maint.
planning

Safety Case

QRA for design of
Safety Function

Condition
Assessment

Design life criteria

RCM/RBI for
maint. planning

Major accident
focus

Management of
techn. safety
barriers

Reliability Mgmt.

Failure mode
and effects
consequence/
likelihood criteria

Program Performance

Major hazards Mgmt.
of techn. & human
safety barriers

A&OI/safety mgmt.
sys, leadership &
work processes

Integrated operations

Online decision
making by expert
groups



General AIM issues in the industry today

Design Integrity:

- Long tradition in the industry to design safety barriers according to regulations and recognised international standards, followed by in-depth verification programs in design and construction.
- Struggle with transfer of data and knowledge from construction to operation.
- **Struggle with change management control.**

Technical Integrity:

- Maintenance management systems (CMMS) are in place.
- ***Varying quality of planning and prioritisation; expert judgement, rather than based on risk models and in-house experience data.***
- Reporting of failure information generally poor for optimisation purposes
- **Drawing conclusions and prescribing actions**

Operational Integrity:

- Overall work process for maintenance/inspection planning and execution well established
- ***Inadequate integration of maintenance and safety work processes***
- ***Work processes for analysis of experience data and continuous improvement not in place***
- Traditionally, operators and maintenance disciplines technically competent, but lack analytical skills required for application of more systematic and advanced decision models.
- **Struggle with knowledge management**

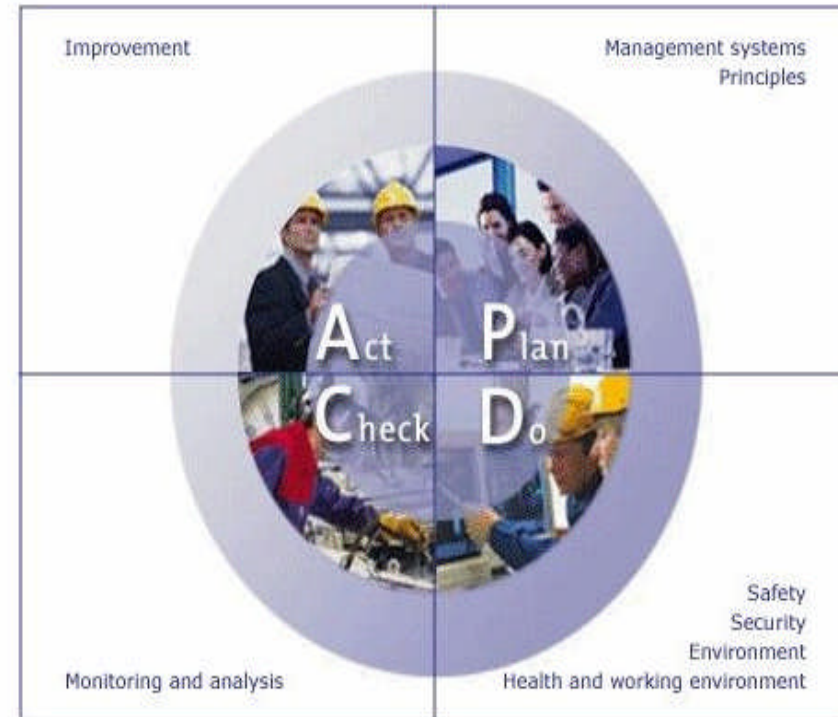
General AIM issues in the industry today (cont.)

“Leadership not setting the process safety “tone at the top”, nor providing effective leadership or cascading expectations or core values to make effective process safety happen”.

Source: Baker report after Texas City accident:

“Many senior managers are not making adequate use of integrity management data and are not giving ongoing maintenance sufficient priority”

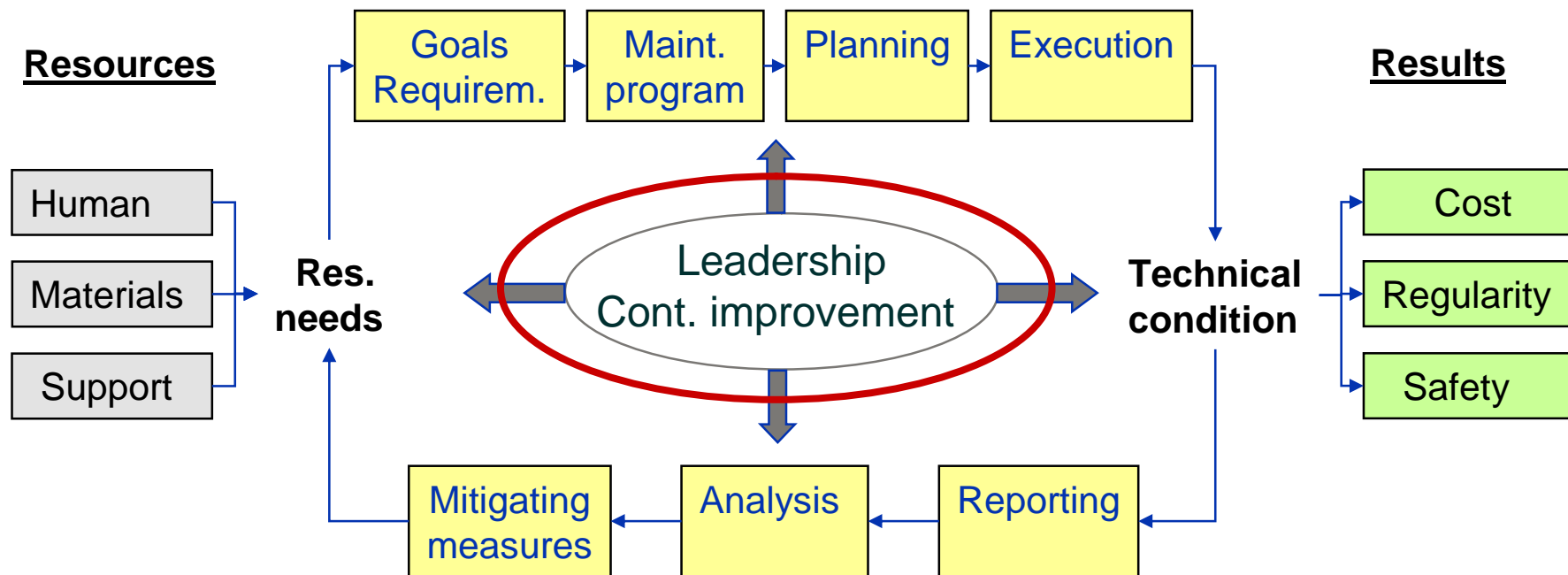
Source: UK HSE



Asset integrity lacks the attention from top management

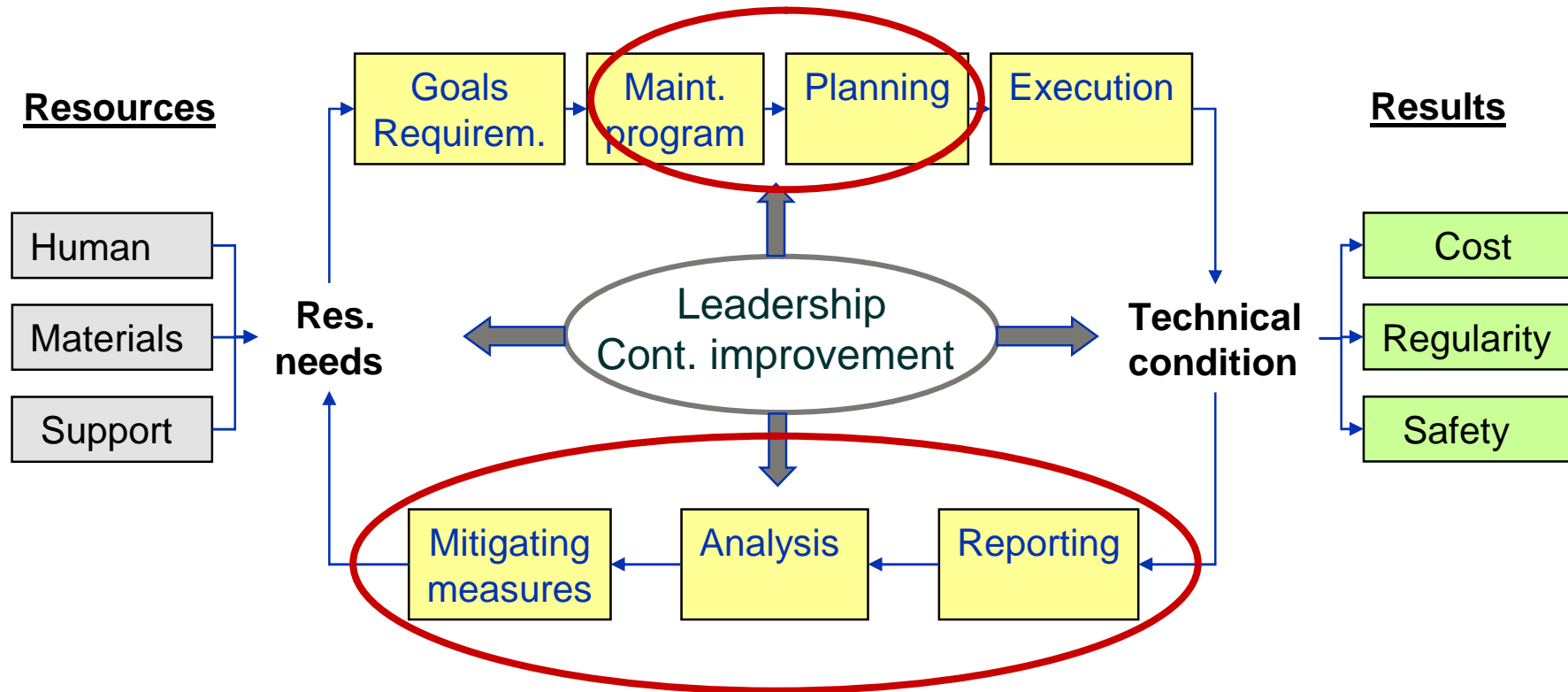
General AIM issues in the industry Today Cont.

Present practice does not support continuous improvement processes



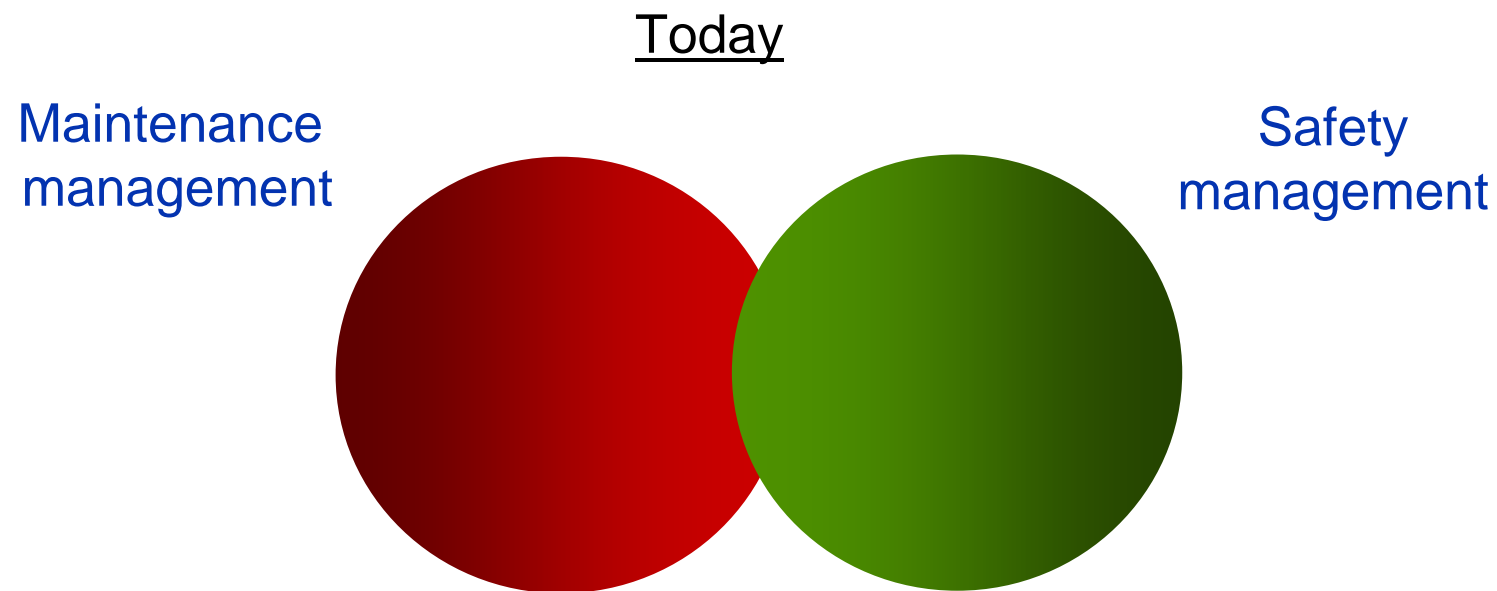
General AIM issues in the industry today (cont.)

Most operators do not have adequate work processes, resources, tools and experience data supporting continuous improvement processes



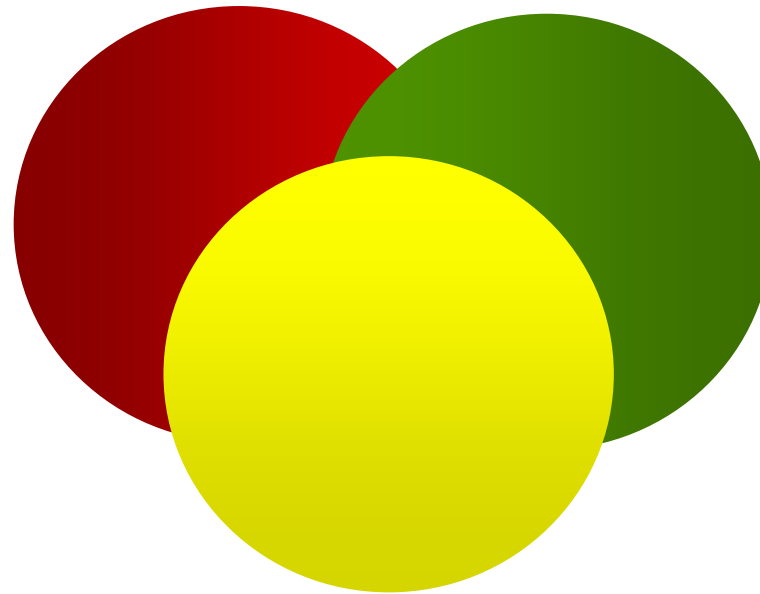
- The role of asset integrity and concept of barriers in major hazard risk control is not well understood.

Inadequate integration of maintenance and safety work processes



Best practice: Integration of safety, reliability and maintenance processes

Maintenance
management



Safety
management

Reliability
management

Big challenge to prioritize resources between safety and production reliability improvements

Today's main safety focus?

Traditional areas:

KPI = Occupational risk indicators:

- Lost Time Incidents
- Medical Treatment
- Restricted Work Case



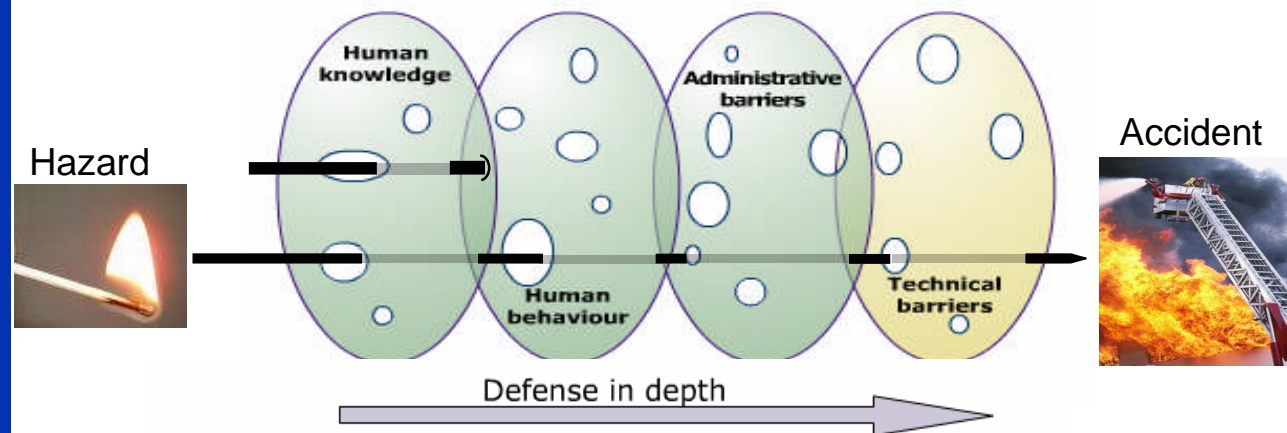
More attention required!

- Tracking of Near-misses with major potentials
- Establishment of Technical Safety Barriers

The Baker Report after the Texas City accident states:

“Focus on occupational safety, but omitting emphasis on process safety creating a false sense of confidence that safety was well managed.”

Initiating event stopped by a functioning safety barrier



Results from recent assessments

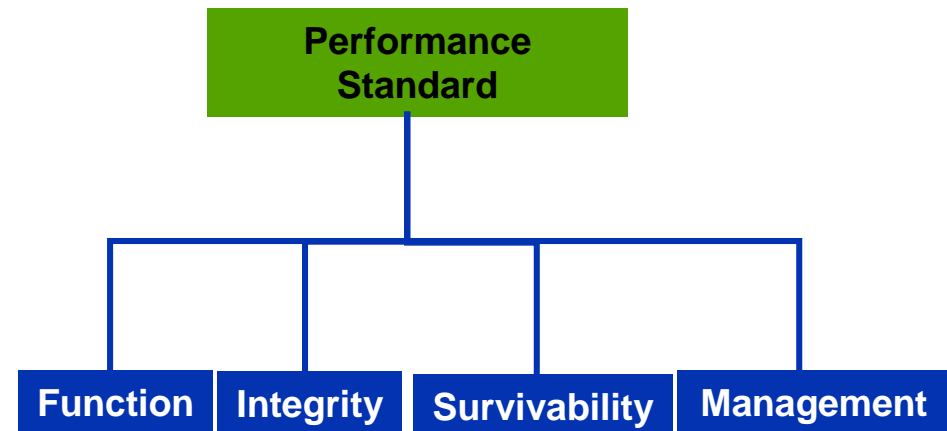
Case1: UK Sector of the North Sea

Speaking at the launch of the KP3 report, Health and Safety Commission Chair, Judith Hackitt said:

".... there can be no mistaking our message to those in the board rooms of the oil and gas offshore companies - there is still much more to do and those in a position of leadership must ensure that systems, procedures and best practice is adopted to achieve the goal of the UK continental shelf becoming the safest offshore sector by 2010".

"Companies need better key indicators of performance available at the most senior management levels to inform decision-making and to focus resources."

Case 2: Norwegian Sector of the North Sea



Estimated for 40 installations in the NCS

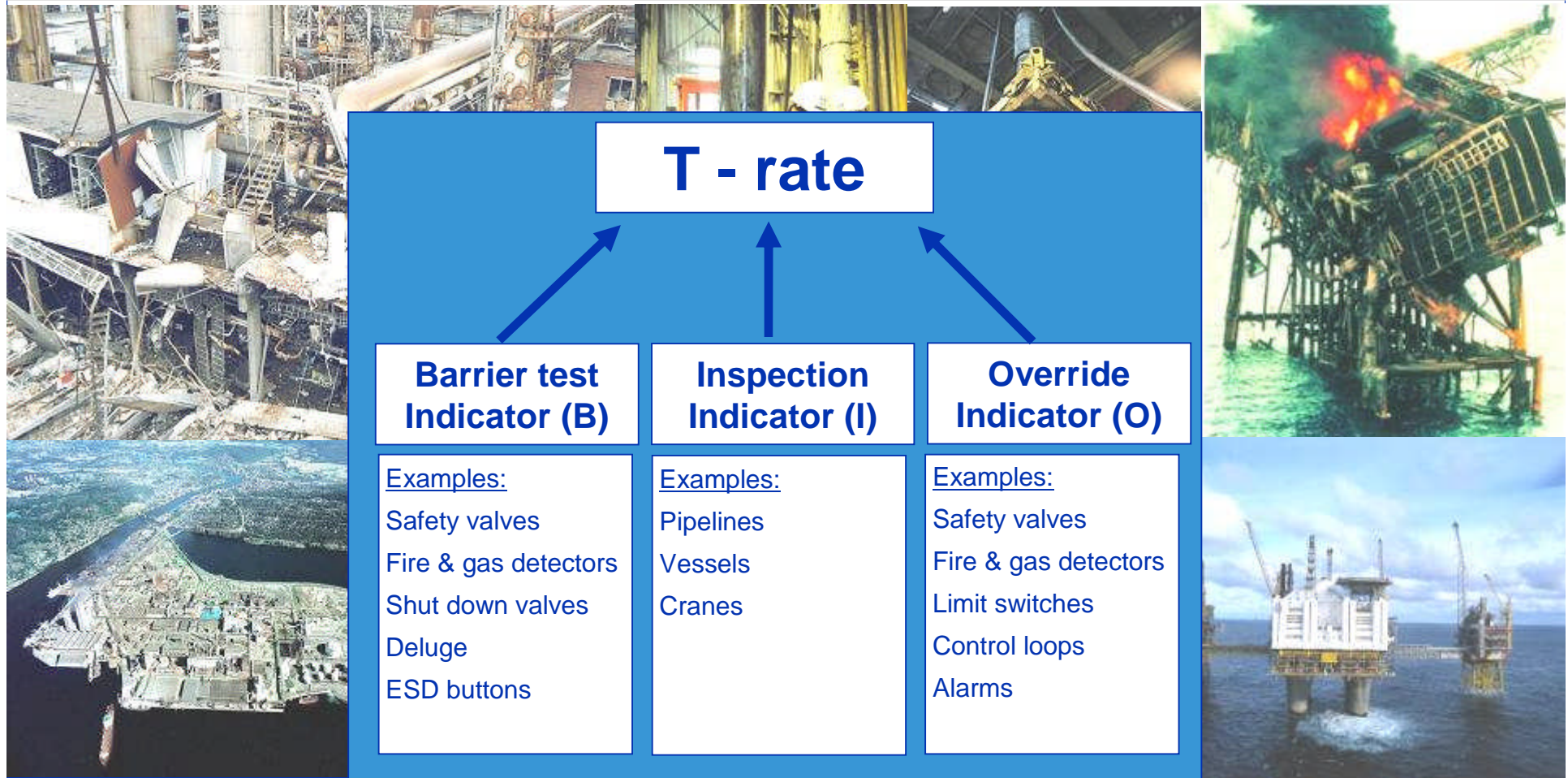
All kind of findings from low to high criticality

Deviations from Best Practice

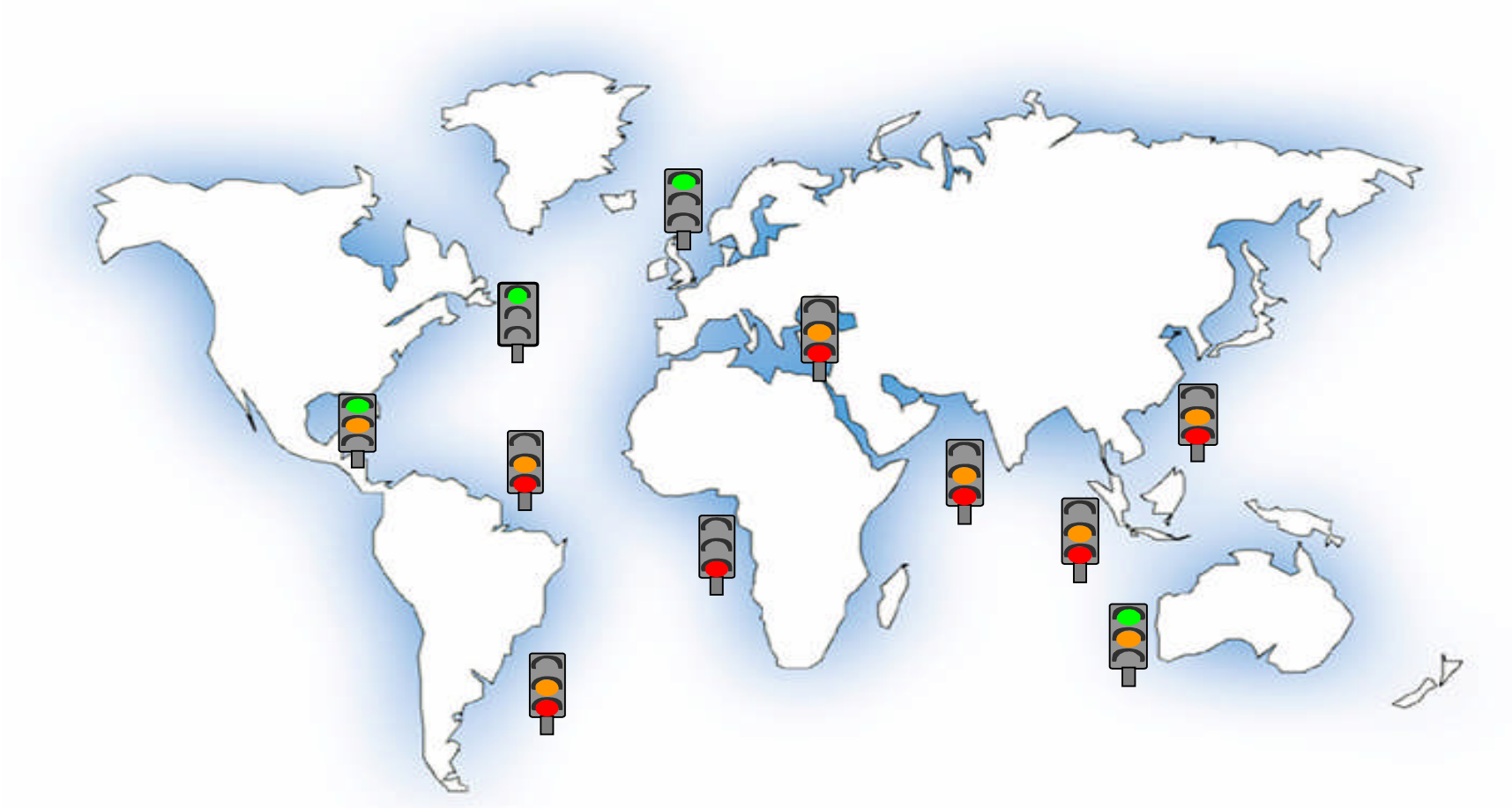
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Technical condition unacceptable: ~10%.
Gaps which requires upgrading.

Indicator on Technical Safety Availability



Concluding remarks



	Mature Regulation and Corporate Governance- Goal Setting and/or Prescriptive Regimes
	Regulatory Mention and/or Corporate Governance – Predominately Prescriptive Regimes
	Corporate Governance Only



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Thanks for your attention!