INTERNATIONAL ASSOCIATION OF DRILLING CONTRACTORS

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Featured remarks for the 2014 IADC Asset Integrity and Reliability Conference, 20 August, Houston

-- by Jay Minmier, 2014 IADC Chairman

Good morning, everyone, and welcome to the 2014 IADC Asset Integrity & Reliability Conference. Many thanks again to our program committee for putting together this high-value event, and to our sponsors for their generous support.

Asset integrity and reliability is the most fundamental and possibly the most challenging aspect of our business today.

But what do we mean by the terms 'asset integrity' and 'reliability'? Let me share a couple definitions.

Asset integrity is the ability of an asset to perform its required function effectively and efficiently while protecting health, safety and the environment. It is the means of ensuring that the people, systems, processes, and resources that deliver integrity are in place, in use and will perform when required over the entire lifecycle of the asset. That last point is important: asset integrity doesn't only mean maintaining old assets.

Reliability, however, is the assurance that a component, assembly, plant, or process will perform its intended function, without failure, for the required time duration when correctly installed and operated in a specified environment. Reliability terminates with a failure. That's when unreliability occurs. We as drillers know all too well the high cost of unreliability.

OK, these are very formal definitions. To put it in regular language, asset integrity means keeping our major structures robust, and keeping oil and gas contained where they belong – in the formation, wellbore, pipelines, storage tanks, and so on.

Reliability means that our equipment and systems work properly when we need them.

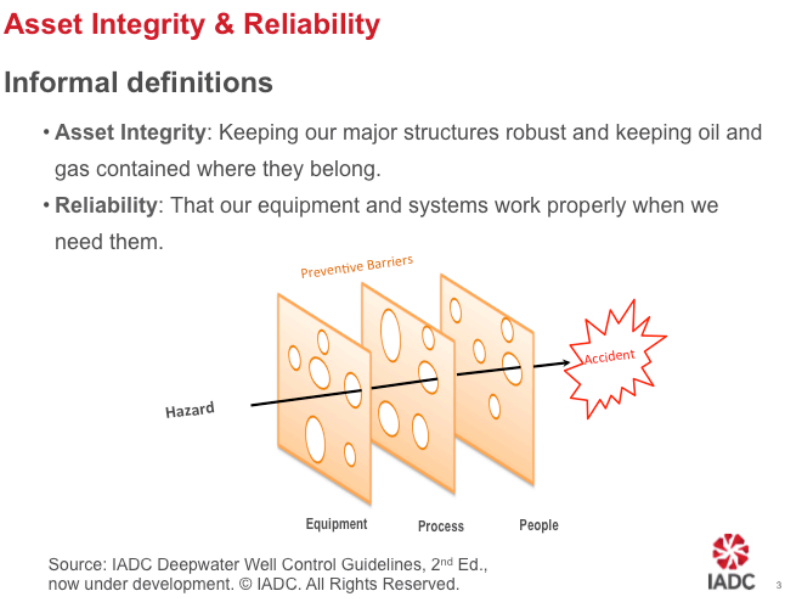
No one needs to tell us that asset integrity and reliability are critical to our industry. But why does it continue to hamper our business?

Why do we tackle widespread, repetitive failures and asset-related incidents differently on different rigs and in different jurisdictions?

Even more worrisome, why do we continue to suffer major accidents caused by factors that we should be able to control?

From Piper Alpha to Macondo, the root causes of historic incidents tend to be strings of simple failures and oversights that are otherwise unremarkable, except they were not intercepted.

The "Swiss cheese" model illustrates this phenomenon.



Drilling is our business: we lead in the drilling space. It's our responsibility to control risks related to asset integrity. These days, however, regulators at all levels are peering intently over our shoulders -- not only from state and national levels, but also in aggregate, through groups such as the International Regulators Forum.

As recently as March, PSA Norway, the Norwegian regulator, published its final report on Macondo. PSA observed that industry had promised much, but has delivered little towards improved well control.

Similarly, in the United States, the Chemical Safety Board also published the latest in its series of Macondo reports. That report especially focused on the unreliability of well-control equipment.

Both Norway and the UK have published detailed reports saying that industry is not meeting its targets in managing risks relating to asset integrity and reliability of safety-critical equipment.

I've heard better news.

Unfortunately, even as these reports come out, our industry faces new hazards and pressures, whether offshore or onshore. The drive to increase productive time forces us to cycle our equipment more frequently. The impact on wear and tear is obvious.

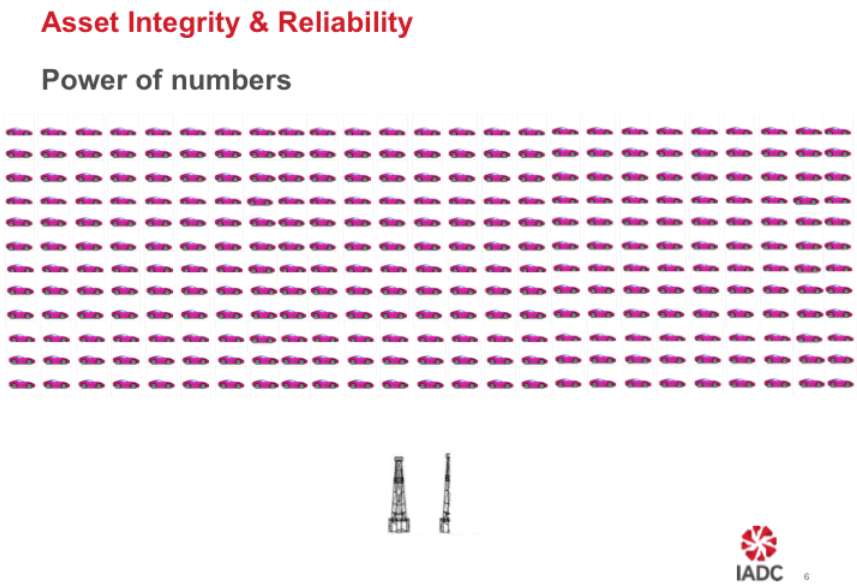
Operators demand that costs be lowered. But at the same time, our equipment and systems are being tested to the limit, and sometimes beyond.

Offshore, we operate in frontier areas, deepwater, remote locations, and in ultra-high-pressure/high-temperature. Mid- and shallow-water locations are the domain of an ageing rig fleet where life-extension maintenance is a key issue.

Onshore, both in the USA and elsewhere, we also cope with challenging geologies and ultra-HPHT environments.

Pad drilling leads to simultaneous hazardous operations, where we manage drilling and workovers adjacent to live production systems. This creates new risks to asset integrity and reliability, especially regarding loss of hydrocarbon containment.

Another problem is that our assets are far fewer than in other industries. Think automobile manufacturing, civil aviation and shipping. This means that building reliable equipment for drilling is less straightforward than industry sectors where market volumes can absorb large numbers of prototypes to remedy patent defects. Offshore top drives and subsea BOPs number in the hundreds: cars and trucks in the millions. There is power in numbers.

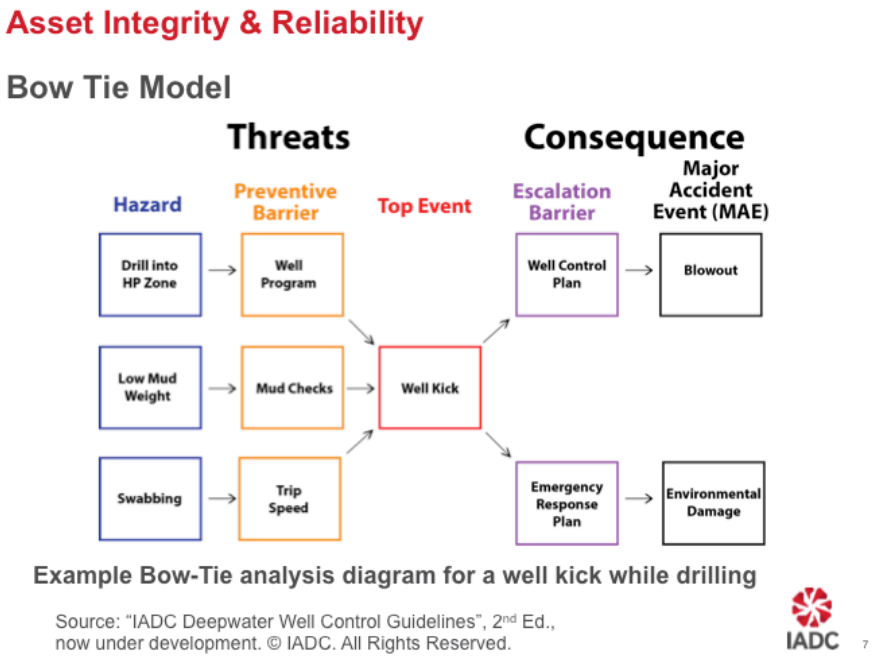


Still, we can be optimistic while avoiding complacency. We have a lot under way in our industry that, to be honest, we might be under-promoting to regulators and our clients.

Asset integrity and reliability are life-cycle characteristics, and begin with design. The critical elements comprise quality engineering, integral systems and processes, and human factors.

You will recognise this three-element sequence from the major-hazard control model known as the "bow tie": where the engineering fails, processes and emergency systems intervene. When these fail, the human being – the least reliable, but by far the most adaptable and innovative element – intercepts the chain of events.

I am encouraged to see the presentations today will address these three major elements.

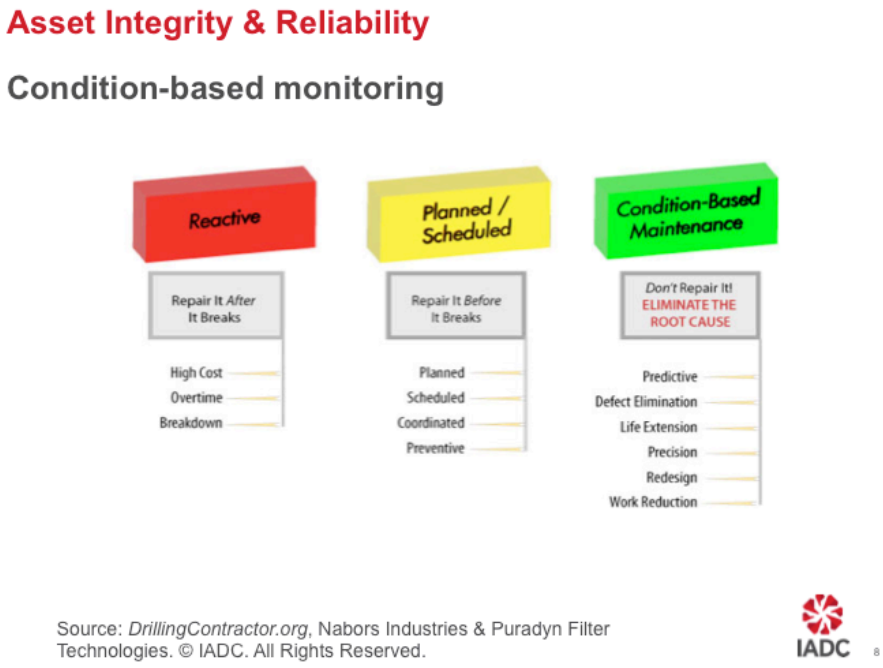


We also recognise the importance of condition-based monitoring. We have come fairly late to this compared to a number of the other major industries, but come to it we have. In order to maintain our assets in fit-for-purpose condition and to ensure our equipment will work when we need it, we must have data from failures, testing, overhauls and inspection.

Reliability determination in complex systems is itself a complex system. However, it is not only becoming well understood, but commonplace.

Many of our members have embraced reliability data collection in a big way, and this effort is supported by manufacturers. The availability of reliability data leads to the adoption of condition-based monitoring of critical components.

Such techniques are gaining in acceptance and the availability of suitable and reliable – there's that word again – sensors deployed in safety-critical locations is increasing.



The data we collect must be shared. Unfortunately, our industry mistrusts sharing data. We have seen this at IADC. To overcome this, databases have become available that can store and process high-quality and pertinent data anonymously.

Why is this important? Well, regrettably, operators, regulators, litigators and opponents to our industry often misuse data, treating them as evidence of poor performance, proof of negligence, or as a means of rating different companies.

Here's a telling example. In Norway and the UK, industry and regulators share and analyze data. During recent negotiations in Europe for new offshore safety regulations, the environmental NGOs claimed that because Norway and the UK were reporting a stubbornly flat line in offshore risk levels, it must mean that those jurisdictions were unfit regimes.

The European Commission – in a surprising attack of good sense – retorted that Norway and the UK were actually positive models in identifying asset integrity- and reliability-related risk. They noted that this good performance was due precisely to their data-sharing practices.

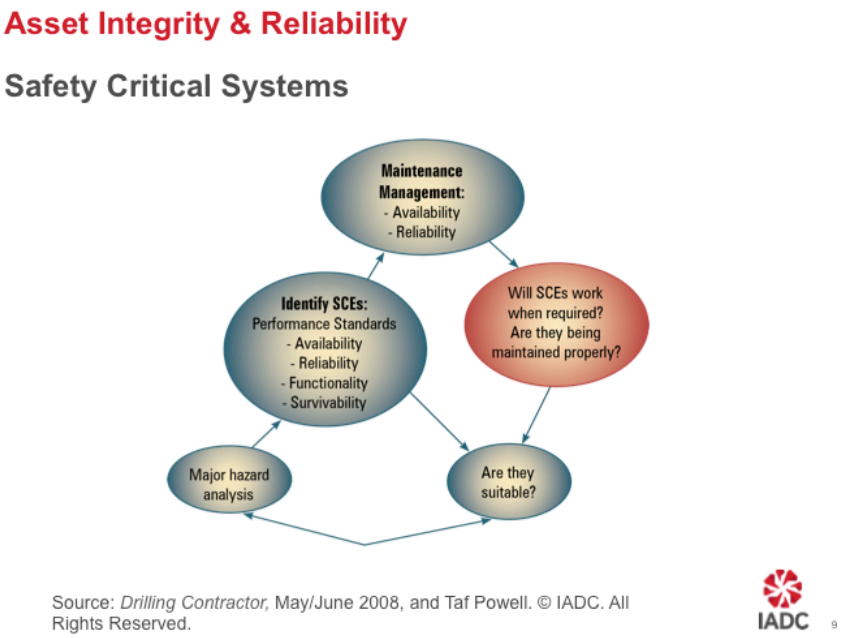
Documentation is important, as well. In a business as complicated as operating drilling rigs, we must accurately document our audits, inspections and system failures. Regulators and operators also require evidence of integrity and reliability through our verification and monitoring.

However, our documentation needs to be fit for purpose and not a just a pencil-pushing exercise. Don't let the paperwork obscure the data and restrain verification.

About 10 years ago the UK regulator undertook an unusual exercise of function-testing safety critical systems, rather than auditing the paperwork. This project was called KP3, and was the subject of an article in the July/August 2008 edition of IADC's Drilling Contractor magazine.

The regulator found functional defects in critical areas, such as fire-intake dampeners and water sprinklers. It was clear that some of the documentation was prepared to satisfy the regulator, rather than assure the rig and platform owners their critical systems were effective.

This was an important lesson in managing integrity.

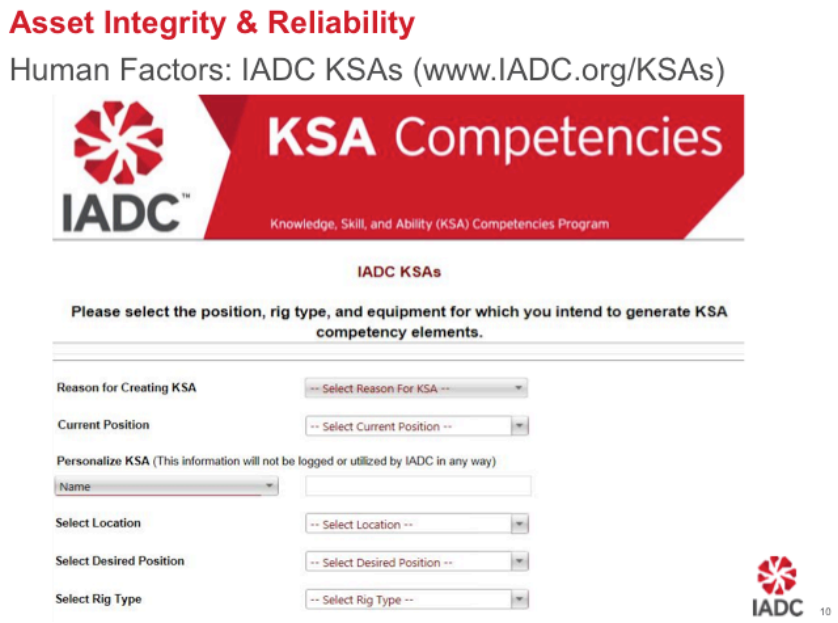


An Integrity Management System should address quality at every stage of the asset life cycle, from the design of new facilities to maintenance management to decommissioning. Inspections, auditing and assurance, human interfaces and overall quality processes are just a few tools designed to ensure an effective integrity management system.

We, the drilling industry, can finish the job and join other high reliability sectors, such as civil aviation and automotive manufacturing. There is a key role here for IADC as the authoritative body in the drilling space.

On the human factors side, IADC's competency program, the KSAs, or knowledge, skills and abilities, identifies maintenance procedures and the proper operation of specific types of equipment, depending on the rig type and environment. This differentiated approach to

competency is vital. The forthcoming issue of Drilling Contractor will feature a major article on human factors. Look for it in September.



For data collection of equipment performance I hope I have demonstrated that arbitrary time-based maintenance procedures can be detrimental to the life cycle of a key component like BOPs. But without sufficient data to support this, it can be difficult to show that other approaches might be more effective.

Contractors are sensitive to this and to sharing data with the goal of improving reliability and performance. This is being demonstrated by a group of Gulf of Mexico drilling contractors who are developing a system to track BOP performance, with the intention that the system will eventually be facilitated by IADC. IADC is supporting this by coordinating efforts such as this one with other industry-led initiatives, such as a global subsea BOP reliability data-collection JIP with the International Oil and Gas Producers (OGP). Our vision is that the end result will be a single global BOP performance information system.

IADC is actively engaging with government policy makers, regulators, and producers to sensibly influence new policies, to advocate better regulatory practices to enable drilling contractors to perform to their best, and to give stewardship to the values of our industry. This active leadership creates trust and gives the space for us to improve reliability and asset integrity in our rigs, our people, and our equipment.

I encourage you to review the excellent article on asset integrity in the July/August edition of Drilling Contractor, which is available here at the conference.

Finally, I want to stress the importance of contractors actively participating in IADC committees, such as well control and operational risk management and competency. We

should also be active in developing standards, which can affect our equipment and its performance, and by putting more focus on life cycle management.

Thank you for your attention, ladies and gentlemen. Have a great conference.

About IADC:

IADC is dedicated to enhancing the interests of oil-and-gas and geothermal drilling contractors worldwide. IADC's contract-drilling members own most of the world's land and offshore drilling units and drill the vast majority of the wells that produce the planet's oil and gas. IADC's membership also includes oil-and-gas producers, and manufacturers and suppliers of oilfield equipment and services. Founded in 1940, IADC's mission is to improve industry health, safety and environmental practices; advance drilling and completion technology; and champion responsible standards, practices, legislation and regulations that provide for safe, efficient and environmentally sound drilling operations worldwide. IADC holds Accredited Observer status at the International Maritime Organization and the International Seabed Authority, specialized agencies of the United Nations. The Association is a leader in developing standards for industry training, notably its Well Control Accreditation Program (WellCAP)□ and rig-floor orientation program, RIG PASS□. IADC is headquartered in Houston and has offices in Washington D.C., the Netherlands, Thailand, and the United Arab Emirates, as well as chapters in the UK, Venezuela, Brazil, Australasia, South Central Asia, Southeast Asia, the Middle East and across the United States. For more information, visit the IADC website at www.iadc.org.

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