



# NEVER SAY NEVER AGAIN

BY DEREK PARK | OIL & GAS IQ

## MACONDO: NEVER SAY NEVER AGAIN



**On the evening of 6<sup>th</sup> July 1988, Piper Alpha exploded and 167 people lost their lives. The subsequent Cullen enquiry was seen as a watershed for UK offshore safety and integrity.**

**In April 2010, Deepwater Horizon suffered a blowout and eleven people died, unleashing an oil slick of up to 4.9 million barrels over an area of 68,000 square miles. Both these tragedies made headlines around the world and have become etched into our industry brains.**

**The reaction from governments and public was ‘never again’ but can government or industry say with any certainty that these tragedies will not be repeated?**

What is perhaps less well known is that in August 2009 there was a blowout in the Montara field off Western Australia involving the jack up rig *West Atlas*.

Thankfully no one died, but the similarities between this incident and the *Deepwater Horizon* tragedy are striking and rather chilling, not only from the technical viewpoint but also in the way that the people involved reacted - or some would say failed to react.

The main players in these dramas are well known and do not need to be named here, but nobody will argue that, fundamentally, both operators and contractors failed to heed George Santyana’s warning that: **“Those who cannot remember the past are condemned to repeat it.”**

It has to be said that governments were equally at fault in the Macondo incident. The US government, particularly stinging in its criticisms after *Deepwater Horizon*, must also bear responsibility for failing to learn the lessons of history, particularly regarding its responsibility to regulate the industry.

So, 21 months on from Macondo, has the industry actually learned the lessons this time? The UK certainly learned from Piper Alpha but have we become smug? Deepwater Horizon surely couldn’t happen here, could it? We have learned and applied all the lessons, surely?

But this year has seen incidents such as the Gannet leak, Chevron’s Nigerian rig fire and *Scotland on Sunday*, recently reported under the headline ‘UK oil spill exercise proves less than slick,’ that ‘a

major exercise to test Britain's handling of a Deepwater Horizon-style disaster has exposed a catalogue of failures...'

We need to have our house in order. It is true that the findings of many past incidents have pointed fingers at governments as well as operators, but we all know who will feel the boot when the political knee jerks.

The European Union is hovering in the wings and a huge consultation exercise is underway. A few clicks around the internet reveal official documents expressing concern that 'there are no EU laws specifically for the offshore industry' followed by a list of directives which could be developed or indeed which exist already and just need to be applied.

Be afraid, be very afraid.

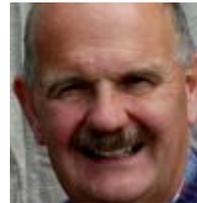
To avoid being overwhelmed with new regulation, the industry needs to be sure of the highest integrity, not just on paper or in press releases but deep and wide across all operations.

I decided to go back through the history of offshore disasters to look for common themes and ask some questions. Have we really learned? Have we really changed? And how exactly would we know if we have?

We can look at statistics and audit reports and kid ourselves that all is fine and dandy but what is the reality? For me, the real answer can only come from those working on the front line.

How does it look and feel working at the sharp end of the industry today?

Are staff listened to when they have a concern or is it true, as most of the media would have it, that cash is king and safety and integrity are kicking about the alms house?



Derek Park

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## LOOKING BACK: DISASTERS IN CONTEXT

### Sea Gem



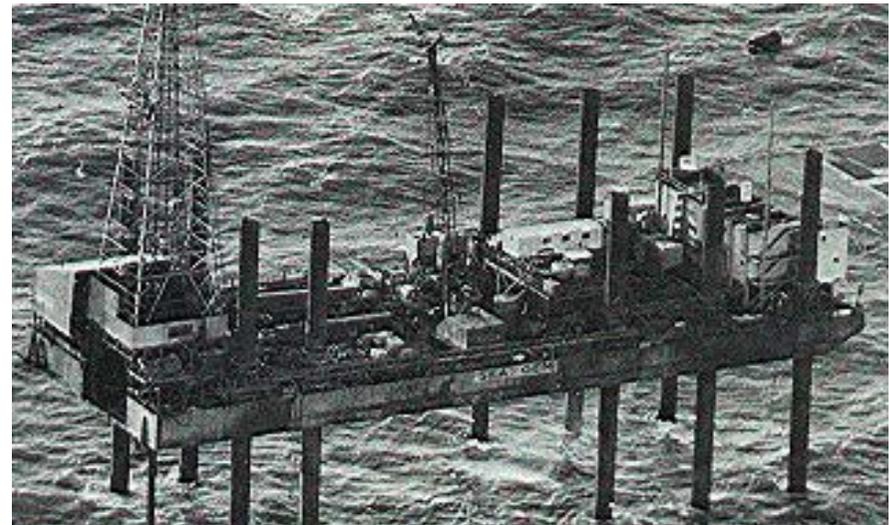
Piper Alpha was nowhere near the start of the story, even in the UK. In September 1965 the jack up rig *Sea Gem* struck gas in what became the West Sole field.

It was the first economically viable strike of the embryonic North Sea industry. Celebrations were short lived because at Christmas that year, two of her ten legs collapsed whilst jacking down and she sank in thirty minutes.

Thirteen men lost their lives. There was no standby boat but fortunately a passing freighter saw the rig collapse and was able to mount a rescue, assisted by helicopters, saving the rest of the crew.

Forty six years on, the technical reasons for the disaster are less important than the other lessons learned.

In the aftermath of 'Sea Gem' two significant regulations were introduced; it was decided that 'somebody should be in charge', leading to the 'OIM regulations' and also that installations should have a dedicated standby boat.



## Alexander Kielland



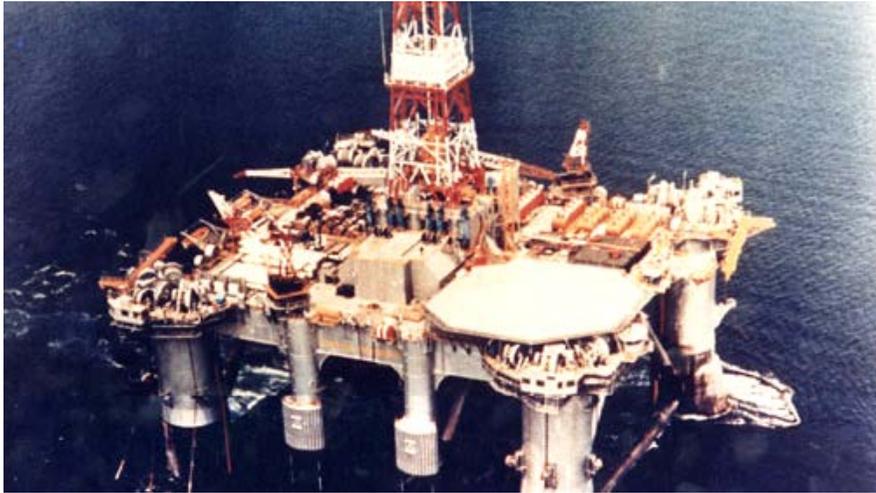
Fifteen years later, in March 1980, the *Alexander Kielland*, a pentagon rig working as a flotel in the Norwegian sector, suffered a leg collapse and 123 people died.

The technical causes of this incident had a significant impact on design and construction, but it was also highlighted that there was no clear source of authority for crisis management and ordering abandonment.

It was claimed that in the 14 minutes between the initial failure and the rig's eventual collapse most of the personnel on board could have escaped if there had been a more effective command structure. It seems that no one took command on the night.



## Ocean Ranger



In February 1982 the *Ocean Ranger* was drilling off Newfoundland. She was hanging off drill pipe in response to severe weather when a portlight failed and her ballast control room was flooded.

Damage to the ballast control panel resulted in an uncontrollable list and in atrocious weather the rig was abandoned and eventually sank. All 84 crew lost their lives.

Investigations concluded that ‘the chain of events was not an inevitable progression and could have been broken by human intervention’.

Also highlighted was a lack of written casualty control procedures, insufficient crew safety equipment and training and a lack of training in the routine and emergency operation of the ballast control system.

There were also issues about appointment, training and certification of the ‘person in charge’.



The Canadian Royal Commission also concluded that the inspection and regulation of the industry by the US and Canadian Governments was ineffective, and subsequently both made commitments to the improvement of the regulatory framework.

## Piper Alpha



Then in 1988 there was Piper Alpha. There is no doubt that in the UK, this awful disaster was a defining moment for the regulation of offshore operations.

Much has been written about the causes of this incident but problems with permit to work, shift handover and isolation procedures all contributed to the fire and explosion.

Another feature that stands out for me was that there was a late change of plan, and a plant isolated for maintenance was brought back on line at short notice.

There were also issues around effective emergency command and control both on Piper itself and on the neighbouring platforms.

At the Public Inquiry, Lord Cullen called for widespread changes in the UK industry - probably the most profound of these was the introduction of the Health and Safety Executive as an independent regulator.

This established a clear distinction between the UK Government's dual roles to develop and regulate the industry.

Recommendations called for improvements to the selection, training and assessment of OIMs and emergency teams. The role of safety representatives was formalised and safety committees established.

An overarching change was the introduction of 'goal setting' regulation and with it the need for operators to submit a safety case covering all aspects of operations.

It meant that operators had to fundamentally run a safe operation rather than allowing them to meet their legal obligations by merely following prescriptive regulations.

## Petrobras P-36



In March 2001, the *Petrobras P-36* platform, a drilling rig converted for Brazilian production, suffered an explosion following over pressurisation of an emergency drain tank (EDT) in a column.

Eleven men lost their lives and the destabilised vessel sank after five days. The depth of water made salvage impossible but the inquiry said the most likely causes were incorrect alignment of the EDT, which permitted oil and gas to flow into the tank, causing the over pressurisation.

The subsequent gas cloud migrated via open doors and ventilation hatches to find an ignition source.

Failure of dampers allowed water to flow into column and pontoon compartments and with two sea water pumps under repair, control of the incoming water became impossible.

A remaining sea water pump was overwhelmed by the flooding and failed, leaving the sea chest valve open. Activation of fire pumps added to the flooding problems.

The inquiry also cited inadequate contingency plans and inadequate training in dealing with emergencies.



## West Atlas



In August 2009, there was a blowout and fire on a wellhead platform in the Montara field off Western Australia. The cantilever jackup *West Atlas* was operating over an adjacent well at the time but all 69 workers were safely evacuated. The well was eventually killed after leaking for 74 days.

The inquiry found that when the well had been suspended earlier in the year - **none** of the well control barriers complied with the operator's own standards or with sensible oilfield practice. The problems centred on the cementing of the 9 $\frac{5}{8}$ " casing, and it transpired that no proper pressure testing had been carried out on the casing shoe.

Amongst other things, the failure of top and bottom plugs and float

valves meant that the cement was likely to have been compromised, yet there was no proper evaluation of the situation or remedial action proffered. The problems were reported to senior personnel at the time but there appeared to be little understanding of the risk. The cement report clearly showed that the casing shoe could not be regarded as having barrier integrity but was signed off by the company man on board.

The situation was compounded by inadequate placement and subsequent removal of other barriers. When the rig returned in August this resulted in the well being exposed to the air for several days without any secondary well control barrier.

There was sole reliance on the untested primary barrier (the cemented 9 $\frac{5}{8}$ " casing shoe) that had been the subject of significant problems during its installation.

The inquiry commented:

*'The problems were not complicated or unsolvable, and the potential remedies were well known and not costly'  
'In essence, the way that the Montara Oilfield was operated ..... did not come within a 'bulls roar' of sensible oilfield practice.'*

*'The Inquiry is of the view that nothing should detract from the primary responsibility of (the operator) to ensure well integrity. However, the Inquiry finds that the (government) regulatory regime was totally inadequate, being little more than a 'tick and flick' exercise.'*

## Deepwater Horizon



And so just 8 months after West Atlas, in April 2010, there was *Deepwater Horizon*. Eleven men died but rightly or wrongly the impact on the environment became the main story.

24 hour news and the involvement of the US President probably gave this incident more coverage than the all the others put together.

We should acknowledge the deep water/high pressure nature of the Macondo operation, but in fact the problems were in many ways predictable and certainly not the result of some 'unknown unknown'.

Detail of the sequence of events is well covered elsewhere but the bare facts are:

- Last minute changes to the design and testing of the 9 $\frac{7}{8}$ " casing and cement contributed to the barriers being inadequate.
- The negative pressure test was accepted although well integrity had not been established.
- Initially the hydrocarbon influx into the wellbore was not recognised and the crew did not act to control the well until oil and gas were past the BOP and into the riser.
- Well control response actions failed to regain control of the well. Three methods of operating the BOP failed.
- Hydrocarbons were diverted to the mud gas separator rather than overboard. This separator was quickly overwhelmed resulting in gas venting on the rig.

(This leaves the intriguing question as to whether concerns for BP's much vaunted environmental performance clouded the judgement of those making critical emergency decisions. With hindsight

the catastrophic environmental impact may well have been averted if a relatively small discharge had been allowed in the early stages of the incident.)

- The fire and gas system failed to prevent gas ignition

There are reams and reams of detailed findings and recommendations arising from *Deepwater Horizon*, but at the risk of over simplification it just seems that every lesson the industry had learned from previous incidents was ignored.

The failed cement job showed startling similarities to Montara just months before, especially in the reaction by those in charge to the unfolding problems.

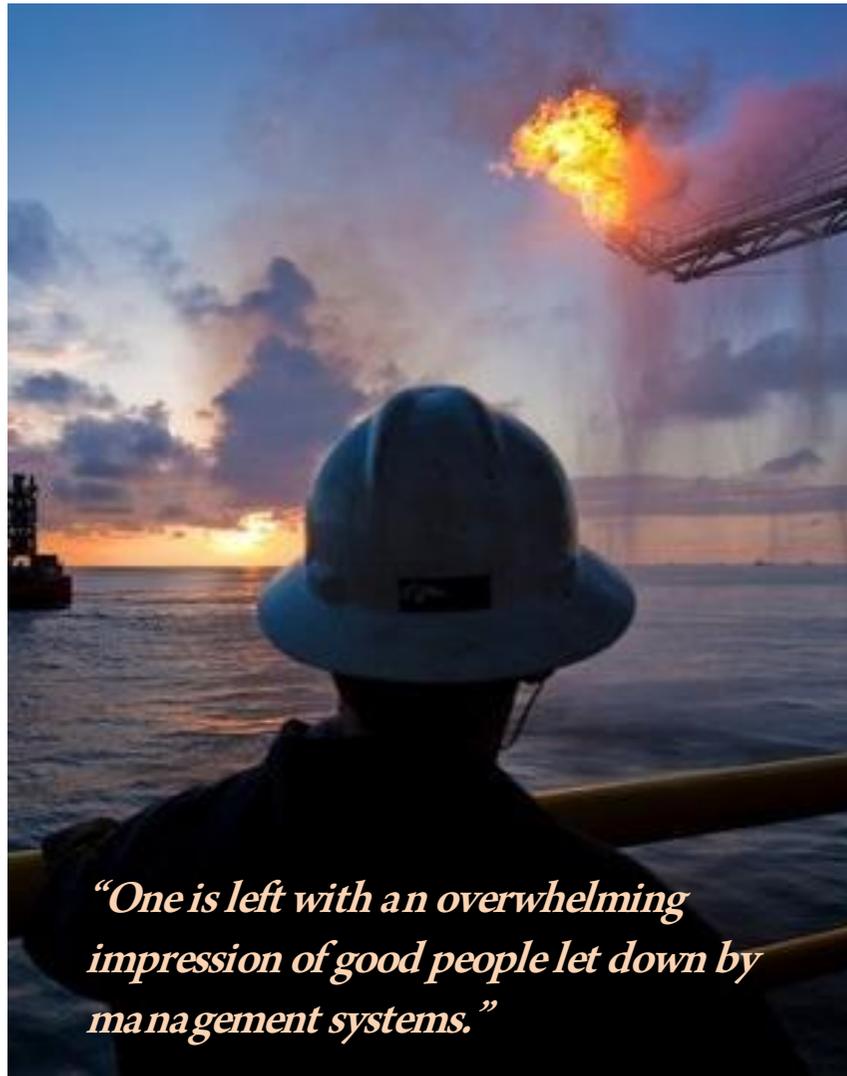
The same service company were involved on both occasions, so opportunities should have been there for all parties involved at Macondo to learn from Montara, if the wider industry culture had been able to absorb and learn.

It was not only the cement job that was at fault. Study the reports and you will find evidence of just about everything seen at previous incidents including:

- Issues around command; who had the ultimate responsibility for controlling the well, activating the emergency disconnect system or organising the evacuation?

- Lack of training in well control and maintenance and operation of BOPs.
- Lack of training in crisis management and emergency response.
- Late and continual changes of design and plan in an atmosphere of urgency and the need to save money. The inquiry later said that BP's corporate culture remained one that was embedded in risk taking and cost cutting.
- Fitness for purpose of the fixed systems for detecting gas, fighting fires and the suitability of passive protection etc. Lack of training in the maintenance of such critical equipment.
- No overarching 'safety case' such as that required in the UK, to demonstrate and test the overall integrity of the operation.
- A mistaken belief that the safety record and culture was good. A ceremony had been held on board on the day of the disaster to celebrate 7 years without a lost time injury.
- No independent government body, similar to the UK HSE, with responsibility for assessing and regulating offshore operations.

## CONCLUSIONS



I have read many reports and sifted through some pretty depressing data whilst writing this article.

Probably the worst part was to read through the *Deepwater Horizon* literature, and repeatedly see mistakes and inadequacies that we hoped had been addressed in the recommendations from earlier incidents.

Just as I was feeling particularly low I came to a chapter called ‘Administrative Recommendations’ in the US Coast Guard Investigation report. It is a list of personnel recommended for public recognition of their actions in response to the emergency. After mentions for the heroic standby boat crew (at least that lesson was learned from *Sea Gem*) there follows a list of heroes from amongst the rig crew.

One is left with an overwhelming impression of good people let down by management systems. I work with front line crews in a variety of industries and cultures and always find an overwhelming majority of people who want to do *the right thing*.

The problems that face the offshore industry can only be addressed by establishing a culture where good people are encouraged and allowed to do *the right things*. It is a pity that in the case of *Deepwater Horizon* the management systems seemed incapable of allowing that to happen.

In 2005, there was an explosion at BP’s Texas City refinery which killed 15 people and should have given the company five years to

get things right, but clearly there was no management recognition that they were very vulnerable to another major incident. Study of the various reports shows that there were many opportunities to do things right, not only as the *Deepwater Horizon* incident unfolded but in the years and months prior to 2010.

So where does that leave us in the UK? Are we doing everything right and the rest of the world has just to catch up? Back in 2004, the HSE produced 'HSE Offshore Health and Safety Strategy to 2010' which stated,

*'A number of barriers appear to inhibit improvements in the safety performance on the UKCS. The UKCS has developed relatively sophisticated safety policies and procedures, which have served to improve the technical integrity of installations, yet have failed to instil, at all levels, personal accountability and responsibility for safety. More importantly visible safety leadership from senior players in the oil and gas industry is not consistent. As a result many workers do not believe it to be the high priority that duty holders claim it to be.'*

One thing that we have in abundance is advice. There are terabytes of reports, studies, audits and articles sloshing around the internet. Management may tend to want a fresh start, yet again, and the consultants will make a fortune whilst all the good work and experience out in the field will be ignored.

There are two sides to every incident; technical and the behavioural. History shows us that it is relatively easy to solve the

technical problems. *Sea Gem* and *Alexander Kielland* were basic problems of engineering and I have no doubt that the experts have made sure that the *Montara* and *Macondo* technical cement problems are solved if indeed there ever was a technological gap.



Of much more concern, and this is what consistently catches us out, is that we fail to effectively change the behaviours that allow the technical hazards to steal up and bite us.

Time and time again there is a failure to do the right thing at the right time which could have nipped a potential incident in the bud.

*“Rushed, last minute and bad decisions made in the middle of the night are all too familiar to most of us.”*



There are many theories as to why this should be, and academics, consultants and regulators will continue to study and analyse. But do we want them to lead the way?

For me there are a few simple things that we should bear in mind which could help us take a big step forward.

- The technical near misses are easy to learn from because they can be scientifically analysed. It is not so easy to learn from the behavioural near misses but we have to get better at routinely doing that analysis. There will be few occasions where equipment failure is the absolute root cause of any incident or near miss, there will almost always be a human element. Do those who have the knowledge and skill needed to prevent these incidents have the power to do so?
- In a global industry with horrendous potential for getting things wrong, is it too much to expect that operators will adopt best practice wherever they operate even there is no obligation to do so? Governments also need to be attentive to their responsibilities.
- Are companies more concerned with their image and influencing business analysts than with real integrity? When an incident occurs is the priority to ‘spin’ the story rather than be open and honest? Which way is the moral compass really pointing?
- Accountability for safety and integrity cannot be contracted out. Managers have to be really clear

about who is responsible for what, especially in a changing or emergency situation.

- How good is the emergency and crisis training for managers and crews? In my experience this developed well after Piper Alpha but have things slipped back at all? When the squeeze comes on costs often the first thing to suffer is training. Is there confidence offshore that key personnel are ready for an emergency?

We should be extremely careful of late changes of plan. Rushed, last minute and bad decisions made in the middle of the night are all too familiar to most of us.

- Are we complacent about our safety performance and culture? I too have the tee shirts from numerous safety awards. Remember that *Deepwater Horizon* held an onboard ceremony on the day of the incident. Such celebrations are *lagging* indicators; we should take more notice of things we are doing which are *leading* us towards genuine improvements.

The only way to be sure that there will not be another Piper or Macondo type incident is if people feel that at all times that they have the confidence and authority to do the right thing within their sphere of expertise.

What alternative is there? We already have rules, standards, audit reports, academic papers and the rest.

These count for nothing if on a remote location in the middle of the night, some hard pressed manager, engineer or technician feels under pressure to take a chance.



WHAT DO YOU THINK?