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AGENDA

- Track Record in Offshore Oil & Gas
- Measures to Mitigate events of the past
- Benchmark in Offshore Oil & Gas
- International Association of Oil & Gas Producers
- Conclusion

Track Record in the Offshore Industry

Safety - Deadliest Accidents

1. Piper Alpha 167

Occidental's Piper Alpha platform was destroyed by explosion and fire in 1988. 167 workers were killed in the blaze.

2. Alexander L. Kielland 123

In 1980, the accommodation rig Alexander L. Kielland capsized during a storm after a leg support brace failed.

3. Seacrest Drillship 91

The Seacrest drillship capsized in 1989 during Typhoon Gay, with the loss of 91 crew.

4. Ocean Ranger 84

A ballast control malfunction caused the Ocean Ranger to capsize during a ferocious storm in the North Atlantic in 1982, with the loss of all hands.

5. Glomar Java Sea Drillship 81

Another storm fatality, the Glomar Java Sea capsized and sank during Typhoon Lex in 1983 with the loss of all on board.

6. Bohai 2 72

In 1979, the jack-up Bohai 2 capsized and sank in a storm while on tow off the coast of China.

Safety - Deadliest Accidents

7. Brent Field Chinook Helicopter 45
A Chinook helicopter shuttle between the Brent Field and Sumburgh crashed into the North Sea in 1986 with only two survivors.

8. Enchova Central 42
During a blowout on the Enchova Central off Brazil, 42 workers lost their lives attempting to evacuate the platform.

10. C. P. Baker Drilling Barge 22
Built in 1962 using an uncommon catamaran design, the C. P. Baker drilling barge burned and sank after a shallow gas blowout.

11. Mumbai (Bombay) High North 22
A support vessel collided with Mumbai High North in 2005, rupturing a riser and causing a major fire that destroyed the platform.

12. Usumacinta 22
Storm winds caused the Usumacinta jack-up to strike the adjacent Kab-101 platform, resulting in a fatal evacuation and blowout in 2007.

Loss of Assets - Most Expensive Accidents

1. Piper Alpha $1,270,000,00

Occidental's Piper Alpha platform was destroyed by explosion and fire in 1988. 167 workers were killed in the blaze.

2. Petrobras P36 $515,000,000

In 2001, an explosion destabilised the P36 production rig in the Campos Basin, Brazil, eventually causing it to sink.

3. Enchova Central $461,000,000

Petrobras' Enchova PCE-1 Platform suffered twice with blowouts and fire in both 1984 and 1988, ending with the loss of the platform in 1988.

4. Sleipner A $365,000,000

A design error resulted in the structural failure in 1991 of the gravity base unit of the original Sleipner A platform.

5. Mississippi Canyon 311 A (Bourbon) $274,000,000

In 1987, the Mississippi Canyon 311 A Bourbon platform in the Gulf of Mexico was tilted to one side by an extensive underground blowout.

Loss of Assets - Most Expensive Accidents

6. Mighty Servant 2 — $220,000,000

The Mighty Servant 2 struck a rock and sank off Indonesia whilst carrying platform modules in 1999.

7. Mumbai (Bombay) High North — $195,000,000 (2005)

A support vessel collided with Mumbai High North in 2005, rupturing a riser and causing a major fire which destroyed the platform.

8. Steelhead Platform — $171,000,000

A blowout in 1987 led to six months of trouble for the Steelhead Platform, resulting in fire and extensive platform damage.

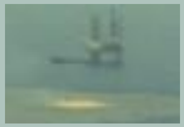
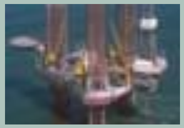
9. Name not known — $122,000,000

1993: Explosion and fire destroyed a platform control room and damaged adjacent platforms on Lake Maracaibo, Venezuela, with eleven fatalites.

10. Petronius A — $116,000,000

In 1998, a crane load line broke while lifting the south topside module of the Petronius platform, dropping the module into the Gulf of Mexico.

Environmental - Offshore Blowouts

	Five Worst Blowouts	Volume Released
	**1. Sedco 135F and the IXTOC-1 Well** In 1979, the IXTOC-1 blowout flowed uncontrollably in the Bahia de Campeche, Mexico until it was capped 9 months later.	3,500,000 barrels
	**2. Ekofisk Bravo Platform** Phillips Petroleum's Ekofisk B platform experienced an 8-day oil and gas blowout in 1977 during a production well workover.	202,381 barrels
	3. Funiwa No. 5 Well Oil from the 1980 Funiwa 5 blowout polluted the Niger Delta for 2 weeks, followed by fire and the eventual bridging of the well.	200,000 barrels
	**4. Hasbah Platform Well 6** Drilled in 1980 by the Ron Tappmeyer jack-up, exploratory well No. 6 blew out in the Persian Gulf for 8 days and cost the lives of 19 men.	100,000 barrels
	**5. Union Oil Platform Alpha Well A-21** The 1969 Union Oil Platform A blowout lasted 11 days but continued leaking oil into the Santa Barbara Channel for months afterwards.	80,000 barrels

Transocean Horizon Rig

Loss of Assets, Loss of Life, Environmental Damage

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Environmental Damage

BP told to pay upto $10 billion for oil spill

United States has asked British energy giant BP to pay in full for the Gulf of Mexico oil spill. The US has also significantly backed increasing the cap on damages faced by companies that pollute the environment. Under a law

introduced after the Exxon Valdez oil tanker disaster in Alaska in 1989, oil companies are bound by law to pay for the full clean-up and containment costs of any oil seeping from their facilities after an accident.

However the legislation caps damages for which the firm is liable at $75 million unless the company is guilty of gross negligence. Bills introduced in the House and the Senate would fix the cap at $10 billion. White House Press Secretary Robert Gibbs has said "We would be in favour of significantly lifting that cap," but did not specify if the White House accepted the $10 billion limit.

"I don't have a specific number. I would reiterate that as the president said, BP is going to get a bill for the recovery, the cleanup and the damage it's caused." Gibbs said.

BP has already offered cash grants of $25 million for US states facing costly cleanup efforts and said that it will "absolutely" live up to its responsibilities to pay for the clean-up operation. It has also said it will honour all legitimate claims stemming from the slick, which is threatening precious fishing grounds, wildlife habitats and beaches along the southern US coast. BP leased the Deepwater Horizon oil platform that blew up and sank in April in the Gulf of Mexico from Houston-based contractor Transocean. The accident killed 11 workers and left an oil well gushing thousands of barrels of oil a day into the ocean. Source: Commodity Online

Track Record in Offshore Oil & Gas

The results of these accidents boiled down to three basic risks or losses:

- Human Life
- Environmental damage
- Loss of assets

Mitigating Measures

Measures to mitigate events of the past:

- ❖ Most Producing companies operating in the offshore environment insist that the contractors and suppliers meet a minimum level of competency in:
  - Quality
  - Safety
  - Environment

Benchmark in Offshore Oil & Gas

Producing companies will not consider a contractor, fabricator, supplier or service provider unless he has been accredited with the following standards or similar:

- **Quality Management (ISO 9000)**
- **Health and Safety Management (ISO 18000)**
- **Environment Management (ISO 14000)**

Benchmark in Offshore Oil & Gas - Levels of Contracting

PRODUCER

TOTAL

bp

LEVEL 1

Eni GROUP Saipem s.a.

KBR

Technip

H MARINE CONTRACTORS

LEVEL 2

Degrémont SUEZ

Linde Engineering Linde

bluewater

PONTICELLI

VWS ENVIG

Litwin A winning future

LEVEL 3

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Benchmark in Offshore Oil & Gas

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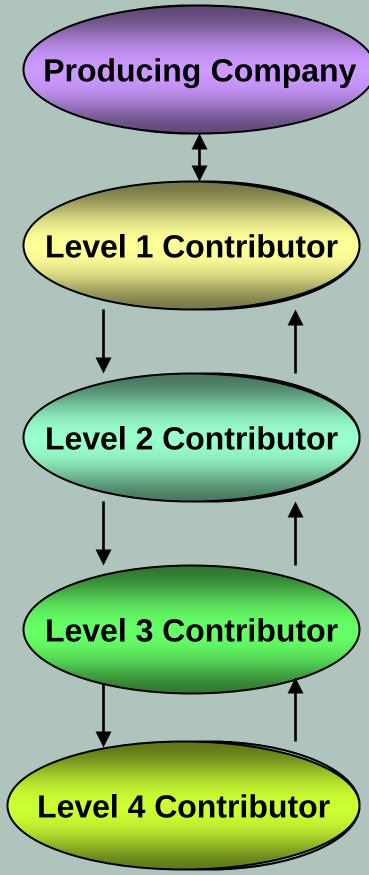
Accreditation must be back to back at all levels of the supply chain



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Health, Safety and Environment – Typical Questionnaire

- Have you got a Health, Safety and Environment Management System in force?
- Is an HSE Manager in place?
- Details of your Health, Safety and Environmental policy
- Have you got an HSE Incentive Scheme implemented?
- Provide details of a management review of the HSE management system
- Attach overall Risk Assessment Document of Contractor and main Subcontractors
- Details of your HSE information and training activity and related procedures
- Details of your HSE Audit planning and procedures
- Details of your environmental management system
- Engineering – details how HSE issues are addressed in the engineering phase (HAZID, HAZOP)
- Details how HSE issues are addressed in the procurement and subcontracting activity
- Provide details about reference Legislation; applicable Contractor's standards, procedures and instructions; project HSE plan
- Provide details about emergency plan, drills, training
- Provide details of incident management procedures

Services – Typical Questionnaire

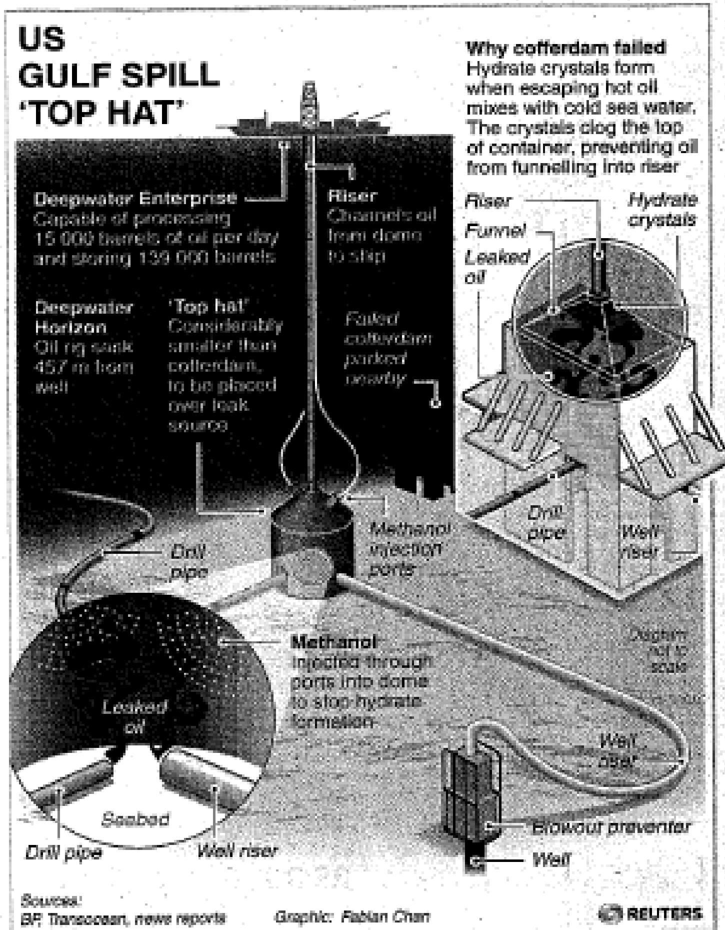
- QA Management System approved by Third Party? (Name of Third Party/Certificate) to be provided.
- Quality Policy
- QA mandatory procedures
- Other QA procedures in place
- Corrective/Preventative/Improvement Actions Management
- Customer Satisfaction monitoring system
- Process monitoring system
- Non-conformities management
- Management review

Quality Control System – Typical Questionnaire

- QC procedures in place
- QC plans for activities in place
- Identification and Tracking system
- Customer Property system
- Identification, Handling, Packaging, Storage and Protection of products
- Equipment/Instrumentation control procedures in place
- Management of Non-conforming products

'SAFETY FEATURES BARELY REGULATED'

The failures that led to devastating oil blowout



JEFF DONN, H JOSEF HEBERT and MITCH WEISS
Sapa-AP

WASHINGTON: The first firm evidence of what probably caused the Gulf of Mexico oil blowout – a devastating sequence of equipment failures – drives home a central unsettling point about America's oil industry: key safety features at tens of thousands of offshore rigs in the United States are barely regulated.

Hearings in Washington and Louisiana laid out a checklist of unseen breakdowns on largely unregulated aspects of safety that may have contributed to the blowout: a leaky cement job, a loose hydraulic fitting, a dead battery.

The trail of problems highlights that safety components are left to the discretion of the companies doing the work.

As the day of the catastrophe got under way on the platform, workers were stabilising the exploratory well to mothball until production.

Shortly after midnight, 22 hours before the explosion, contractor Halliburton finished pumping cement into the well. Workers capped the drill pipe with cement plugs to stop any upsurge of gas or oil in the piping. The cement and metal casing along well walls were checked. Positive pressure tests indicated they were sound.

But there are no federal standards for the make-up of the crucial cement filler. Government and industry have been working to publish new guidelines later this year, but they will not be mandates.

BP said yesterday its costs for trying to stop the gusher, containing the spill and helping Gulf states foot the response tab totalled $450 million (R3.3bn), up $100m since its May 10 update to securities regulators. BP Chief Operating Officer Doug Suttles said the bill rises by at least $10m a day.

Yesterday, Louisiana crab fishermen claimed that Halliburton used a cement mix with nitrogen that could allow dangerous bursts of methane gas to escape up the well.

Testimony was that the first sign of trouble came before dawn. Workers pumped out heavy drilling fluid for a negative pressure test to make sure underground gas couldn't seep into the well. That test failed, as did another test.

Workers debated what to do, and decided to resume work.

Further reducing blowout protection, heavy drilling fluid was pumped out from the wellhead. It was replaced with seawater in preparation for placing the last cement plug.

Federal rules say an operator must hold newly cemented well-wall casing under pressure for up to 12 hours before resuming drilling. Other than that, there are few rules about how long to let cement set.

The last plug was still missing just before 10pm on April 20, when drilling fluid pushed by underground gas started kicking up uncontrollably.

Desperate rig workers tried to activate hydraulic cut-off valves. But hydraulic fluid was leaking from a loose fitting in the preventer's emergency system, making it harder to activate rams to cut piping and cap the blowout. A battery had gone dead in a control pod meant to switch on the preventer in an emergency.

Yet industry officials acknowledged a fistful of regulatory and operational gaps: there is no government standard for design or installation of blowout preventers; the federal government doesn't routinely inspect them before installation; emergency systems usually go untested once set on the seafloor at the mouth of the well; the federal government doesn't require a backup.

As gas pushed upward on the Deepwater Horizon, it suddenly ignited from an unknown source and turned the platform into an enormous fireball, killing 11 people. In the following days, workers tried to force the blowout preventer to close.

Maddeningly, they lost a day trying to close a ram without realising it had been replaced by a useless test part.

The unrelenting gusher of oil is now threatening wetlands, wildlife, the fishing industry and tourism.

International Association of Oil & Gas Producers

- 75% of oil and gas producers belong to OGP
- Set standards for contractors, fabricators, designers, manufacturers, suppliers and designers

International Association of Oil & Gas Producers

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OGP's position on standards is to:

- Promote development and use of ISO and IEC International Standards
- Ensure standards are simple and fit for purpose
- Use International Standards without modification wherever possible
- Ensure visibility of the international standard's identification number, whatever the method of publication
- Base development of standards on a consensus of need
- Avoid duplication of effort
- Minimise company specifications which should be written, where possible, as functional requirements; and
- Promote "users" on standards work groups

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ISO Standards for use in the oil & gas industry

ISO 10418	Basic surface safety systems
ISO 10423	Wellhead & christmas tree equipment (Rev)
ISO 13533	Drill-through equipment (BOPs)
ISO 13534	Hoisting equipment - care/maint (Rev)
ISO 13535	Hoisting equipment - specification (Rev)
ISO 13626	Drilling and well-servicing structures
ISO 13702	Control & mitigation of fire & explosion
ISO 13703	Offshore piping systems
ISO 14224	Reliability/maintenance data
ISO 14692	GRP piping, Parts 1-4
ISO 14693	Drilling equipment

ISO 15156-1	Selection of cracking resistant materials for use in H_2S environments (Rev)
ISO 15156-2	Cracking-resistant steels and cast irons for use in H_2S environments (Rev)
ISO 15156-3	Cracking-resistant alloys for use in H_2S environments (Rev)
ISO 15138	HVAC
ISO 15544	Emergency response (Amd)
ISO 15663	Life cycle costing, Parts 1-3
ISO 17776	Assessment of hazardous situations
ISO 20815	Production assurance and reliability management
ISO 21457	Materials selection (New)
ISO/TS 27469	Method of test for offshore fire dampers (New)
ISO/TS 29001	Sector-specific quality management systems (Rev)

ISO 3977-5	Gas turbines – procurement
ISO 10428	Sucker rods
ISO 10431	Pumping unites
ISO 10434	Bolted bonnet steel gate valves
ISO 10437	Special-purpose steam turbines (Rev)
ISO 10438	Lubrication, shaft-sealing and control-oil systems, Parts 1-4
ISO 10439	Centrifugal compressors
ISO 10440-1	Rotary-type positive-displacement process compressors (oil-free)
ISO 10440-2	Rotary PD packaged air compressors
ISO 10441	Flexible couplings – special
ISO 10442	Integrally geared air compressors
ISO 13631	Reciprocating gas compressors
ISO 13691	High speed enclosed gear units
ISO 13704	Calculation of heater tube thickness
ISO 13705	Fired heaters for general service
ISO 13706	Air-cooled heat exchangers
ISO 13707	Reciprocating compressors
ISO 13709	Centrifugal pumps (Rev)

ISO 13710	Reciprocating positive displacement pumps
ISO 14691	Flexible couplings – general
ISO 15547-1	Plate & frame type heat exchangers
ISO 15547-2	Brazed aluminium platefin type heat exchangers
ISO 15649	Piping
ISO 15761	Steel valves DN 100 and smaller
ISO 16812	Shell & tube heat exchangers
ISO 17292	Metal ball valves
ISO 21049	Centrifugal and rotary pumps shaft sealing
ISO 23251	Pressure-relieving and depressuring systems
ISO 23936-1	Thermoplastics (New)
ISO/TS 24817	Composite repair of pipework
ISO 25457	Flares details
ISO 28300	Venting of storage tanks
ISO 28460	LNG - Ship to shore interface (New)

ISO 13624-1	Marine drilling riser systems (New)
ISO/TR 13624-2	Marine drilling riser system analysis (New)
ISO 13625	Marine drilling riser couplings
ISO 19901-7	Station-keeping systems for floating offshore structures (Rev)
ISO 19904-1	Floating offshore structures

ISO 19900	Offshore structures - general requirements
ISO 19901-1	Metocean design and operating considerations
ISO 19901-2	Seismic design
ISO 19901-3	Topsides structure (New)
ISO 19901-4	Geotechnical and foundation design
ISO 19901-5	Weight control
ISO 19901-6	Marine operations (New)
ISO 19902	Fixed steel offshore structures
ISO 19903	Fixed concrete offshore structures
ISO 19906	Arctic offshore structures (New)

ISO 3183	Steel pipe for pipeline transportation systems
ISO/TS 12747	Pipeline life extension (New)
ISO 13623	Pipeline transportation systems (Rev)
ISO 13847	Pipeline welding
ISO 14313	Pipeline valves
ISO 14723	Subsea pipeline valves (Rev)
ISO 15589-1	Cathodic protection for on-land pipelines
ISO 15589-2	Cathodic protection for offshore pipelines
ISO 15590-1	Pipeline induction bends (Rev)
ISO 15590-2	Pipeline fittings
ISO 15590-3	Pipeline flanges
ISO 16708	Pipeline reliability-based limit state design
ISO 21329	Test procedures for pipeline mechanical connectors
ISO 21809-2	Fusion-bonded epoxy coatings
ISO 21809-3	Field joint coatings for pipelines (Amd)
ISO 21809-4	Polyethylene coatings (2-layer PE) (New)
ISO 21809-5	External concrete coatings (New)

ISO 13628-1	Subsea production systems (Amd)
ISO 13628-2	Subsea flexible pipe systems
ISO 13628-3	Subsea TFL pumpdown systems
ISO 13628-4	Subsea wellhead and tree equipment (Rev)
ISO 13628-5	Subsea control umbilicals (Rev)
ISO 13628-6	Subsea production controls

ISO 13628-7	Completion/workover riser system
ISO 13628-8	ROV interfaces
ISO 13628-9	ROT intervention systems
ISO 13628-10	Bonded flexible pipe
ISO 13628-11	Flexible pipe systems for subsea and marine applications

ISO 10427-2	Centralizer placement and stop-collar testing
ISO 10427-3	Performance testing of cement float equipment
ISO 10432	Subsurface safety valves
ISO 11960	Casing and tubing (Rev)
ISO 11961	Drill pipe
ISO 13500	Drilling fluids (Amd)
ISO 13501	Drilling fluids - processing systems evaluation
ISO 13503-1	Measurement of viscous properties of completion fluids
ISO 13503-2	Measurement of properties of proppants (Amd)
ISO 13503-3	Testing of heavy brines
ISO 13503-4	Measurement of stimulation & gravelpack fluid leakoff
ISO 13503-5	Measurement of long term conductivity of proppants
ISO 13678	Thread compounds (Rev)
ISO 13679	Connection testing (Rev)
ISO 13680	CRA seamless tubes for casing and tubing

ISO 14310	Packers and bridge plugs
ISO 15136-1	Progressing cavity pump systems (Rev)
ISO 15136-2	Progressing cavity pump systems - drive heads
ISO 15463	Field inspection of new casing, tubing and plain end drill pipe
ISO 15546	Aluminium alloy drill pipe
ISO 16070	Lock mandrels and landing nipples
ISO 17078-1	Side-pocket mandrels (Amd)
ISO 17078-2	Flow control devices for side-pocket mandrels (Amd)
ISO 17078-3	Latches & seals for side-pocket mandrels & flow control devices (New)
ISO 17078-4	Side-pocket mandrels and related equipment (New)
ISO 17824	Sand control screens (New)
ISO 28781	Subsurface tubing mounted formation barriers (New)

ISO/TR 10400	Calculations for OCTG performance properties
ISO 10405	Care/use of casing/tubing
ISO 10407-1	Drill stem design
ISO 10407-2	Inspection and classification of drill stem elements
ISO 10414-1	Field testing of water-based fluids
ISO 10414-2	Field testing of oil-based fluids
ISO 10416	Drilling fluids - lab testing
ISO 10417	Subsurface safety valve systems
ISO 10424-1	Rotary drill stem elements

ISO 10424-2	Threading and gauging of connections
ISO 10426-1	Well cementing (Rev)
ISO 10426-2	Testing of well cements (Rev)
ISO 10426-3	Testing of deepwater well cement
ISO 10426-4	Preparation and testing of atmospheric foamed cement slurries
ISO 10426-5	Shrinkage and expansion of well cement
ISO 10426-6	Static gel strength of cement formulations
ISO 10427-1	Bow spring casing centralizers

Standards in brown issued in 2009

Standards in green are a priority for 2010 issue

These ISO standards are only a core collection of several hundreds of International Standards available for the oil & gas industry

with 1996 analysis shows an increase from 16 to 38% reference to international standards and a decrease from 39 to 14% reference to national standards.

API standards are dominating, with 225 references, including 49 API Manual of Petroleum Measurement (MPMS) standards. ISO has delivered 152 of the standards referenced by the regulators covered by this report and 59 of these come from the work of ISO/TC 67. Referenced standards appear to be voluntary in most of the regulatory regimes, in the sense that other technical solutions can be opted for provided proof of compliance can be documented.

Capture the value added

Make use of well over 145 new ISO standards for your own benefit!

The main conclusions based on these findings can be summarised as follows: This report shows clearly that standards play an important role in the regulators technical definition of the safety level of oil and gas installations they regulate. In fact, the oil and gas industry and regulators cannot work effectively without using these standards. The diversity of references provides a challenge for international operators in understanding and applying correctly all of these different references for the actual E&P activities in different countries. Download OGP's report from *http://www.ogp.org.uk/pubs/426.pdf*.

ISO STANDARDS ON PIPELINE COATINGS

Until now, the existence of different standards throughout the world for external pipeline coatings has posed problems for suppliers, purchasers, manufacturers and end users. Solutions are now available with the recent publications of three standards that were developed by the ISO/TC67/SC2:

- ISO 21809-1: Polyeofin coatings (3 layer) – publication pending
- ISO 21809-2, -3 and -4 published
- ISO 21809-5: External concrete coatings – publication due first half of 2010

Each of these standards will provide in a single document a consistent and unified approach to requirements for these pipeline coating systems worldwide. The standards specify in detail the requirements for the qualification, application, testing and handling of the coatings applied for the external corrosion protection of bare steel pipe for use in pipeline transportation systems in the petroleum and natural gas industries. They will facilitate the educated purchasing, specification, manufacturing and application of these coatings in the international market place. These ISO standards will cut costs and complications for petroleum and natural gas sectors.

ISO 10423 WELLHEADS & CHRISTMAS TREES REVISED

December 2009 saw the release of the 4th edition of this key ISO standard 10423 for Wellheads and Christmas trees. This complex standard has been updated to the needs of the industry today. For example, it includes now a wider references to International Standards for e.g. NDE techniques. ISO 15156 (NACE MR 0175) has now been implemented for sour service material requirements. Many more changes have been made that are relevant to manufacturers and end-users. Implementation of this latest revision offers more flexibility without compromising safety. API voted at their winter meeting in February to issue an adopt-back ballot for the new issue of ISO 10423 as API 6A 20th edition.

SUCCESS STORY – ADOPTION PROGRESS

API have now (February 2010) re-adopted some 76 of the ISO standards shown above. CEN adoptions are at some 132. GSO has adopted around 62 ISO standards shown above. These numbers represent growing consensus in the oil & gas industry around the globe. With Brazil, Canada, China, Kazakhstan, Russia and others adopting the same ISO standards, we are progressing towards the vision:

Global standards used locally worldwide

Conclusion

If you are not ISO certified or similar, you stand a minimal chance of doing business in the offshore Oil and Gas Industry

PS:

Venezuelan gas rig sinks in Caribbean,

A Venezuelan natural gas exploration rig sank in the Caribbean sea early on Thursday, but all 95 workers were evacuated safely and there was no leakage, the government said.

Left : File photo of the **ABAN PEARL**, seen under maintenance at Batam (Indonesia) early last year
Photo : Piet Sinke ©

The accident came less than a month after a rig owned by BP exploded and sank in the Gulf of Mexico, triggering one of the world's worst-ever oil spills. Venezuela's Energy Minister Rafael Ramirez said no gas was escaping from the Aban Pearl rig site after the platform disappeared beneath the waves near the northeast coast of the OPEC nation, close to the Trinidad and Tobago islands. "At 2:20 a.m. (0650 GMT) the rig sunk completely. I flew over it this morning and there is nothing to see," Ramirez told Reuters.

The government had been proud of the **Aban Pearl**, which was the first offshore gas rig operated by state oil company PDVSA. State television frequently portrayed the platform as evidence of Venezuela's engineering prowess. PDVSA said the Dragon 6 oil field where the rig was working had been successfully sealed after the accident. Critics of President Hugo Chavez say he weakened state-oil company PDVSA by firing thousands of managers and technicians several years ago. The company is the main financier of his socialist revolution and has suffered cash flow problems on lower oil prices.