

EXECUTIVE SUMMARY

A set of International Standards for a wide selection of vital oil & gas industry materials, equipment and offshore structures is emerging from the International Standards Organization, ISO. These standards are primarily the responsibility of ISO Technical Committee 67 (ISO TC67). They are developed using a consensus process that includes more than 3000 oil & gas industry experts from around the globe and an international review and approval process.

150 ISO standards have now been issued, including 15 revisions or new publications in 2010. As many as 28 standards are planned for revision or new publication this year. The international oil and gas industry and national standardisation

organisations support these standards for worldwide applications. North and South American, Canadian, Chinese, European, Gulf states, Russian and other standards bodies are now adopting them for regional and national use.

For industry, they will reduce costs and delivery time, and facilitate trade across national borders. For regulators, they offer support for goal-setting and functional regulations, while achieving higher levels of safety through better design. These standards are now being implemented widely in oil and gas provinces around the world, replacing existing industry, regional and national standards and eliminating or reducing the need for company-specific specifications. For details on standards available from ISO TC67, See the wall-chart inside or www.iso.org.



<http://info.ogp.org.uk/standards/>

- Deep water well design considerations
- Control and mitigation of fires and explosions
- Risk and emergency preparedness analysis
- Reliability modeling and calculation of safety systems
- General approach to in-service inspection
- Competence of personnel
- Safety culture

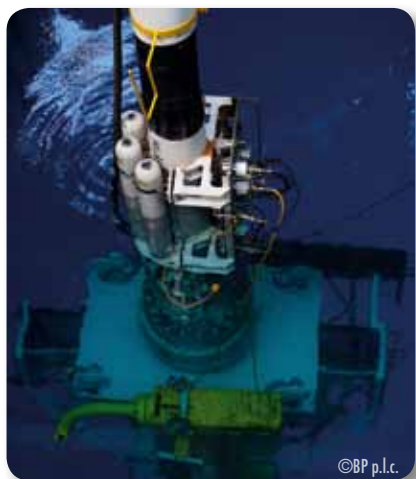
ISO POST MONTARA AND MACONDO

In the Montara (West Australia) and Macondo (US Gulf of Mexico) accidents, our industry lost 11 colleagues, injured 17, caused much environmental damage, and caused material, financial and reputational loss. Standards bodies such as ISO (via its ISO/TC 67), API, and others have developed and maintained standards that are intended to facilitate the defense against such accidents. As an international industry, the lessons learned from an accident in one country must be transferred globally. International standards developed by ISO are one way of achieving this. In order to continue with this, it is now essential that the recommendations following out of the investigations into these and other accidents as well as those resulting from a more general period of industry reflection are implemented through the international standards portfolio.



As a consequence, ISO/TC 67 decided at its plenary meeting in October 2010 to prepare a roadmap/action plan on standards which should be revised or developed. Its Management Committee (MC) has now agreed a program for revision or new development of drilling, well construction and well operations International Standards. The plan seeks to implement the recommendations referred to above in so far that they relate to international standards. It includes 31 off actions and standards for subjects like:

- Wells integrity
- HSE management systems
- Testing of deepwater well cement formulations
- Isolating potential flow zones during well construction
- Design and testing of foam cement slurries
- Design and manufacture of float equipment
- Well control equipments for HPHT (High Pressure High Temperature) drilling operations
- BOP equipment systems for drilling wells



The plan has seen input from API, International Regulators' Forum, OGP's Global Industry Resource Group, ISO Subcommittee chairs, Work Group conveners etc. A number of key investigation reports on recent accidents have been analyzed for input to the plan. A number of the high priority subjects are already being addressed in API and in ISO. The MC has assigned a small task force to look after and support these activities.

OGP Standards Committee and ISO TC67 plenary go to Moscow for meetings 13th and 14-15th September 2011 respectively.

API POST MACONDO

API has been very active the last several months with a significant standards development and revision programme following the Macondo accident that includes among others the following documents:

- RP 96 – Deepwater Well Design Considerations (new)
- Bull 97 – Well Construction Interface Document (new)
- Std 53 – Blowout Equipment Systems for Drilling Wells (revision)
- Spec 16A – Specification for Drill-through Equipment (revision)
- Spec 16C – Choke and Kill Systems (revision)
- Spec 16D – Control Systems for Drilling Well Control Equipment (revision)
- RP 17H/ISO 13628-8 – Remotely Operated Vehicles (revision)
- Std 65-2 – Isolating Potential Flow Zones During Well Construction (new)

ISO Standards for use in the oil & gas industry

ISO 10418 Basic surface safety systems
 ISO 10423 Wellhead & christmas tree equipment
 ISO 13533 Drill-through equipment (BOPs)
 ISO 13534 Hoisting equipment - care/maint
 ISO 13535 Hoisting equipment - specification
 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 H₂S environments
 ISO 15156-2 Cracking-resistant steels and cast irons for use in H₂S environments
 ISO 15156-3 Cracking-resistant alloys for use in H₂S environments
 ISO 15138 HVAC
 ISO 15544 Emergency response
 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 23936-1 Thermoplastics
 ISO 23936-2 **Elastomers (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 units
 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 12211 **Spiral plate heat exchangers (New)**
 ISO 12212 **Harpin heat exchangers (New)**
 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 (Rev)**
 ISO 13707 Reciprocating compressors
 ISO 13709 Centrifugal pumps
 ISO 13710 **Reciprocating positive displacement pumps (Rev)**

ISO 14691 Flexible couplings – general
 ISO 15547-1 Plate & frame type heat exchangers
 ISO 15547-2 Braze 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 (Rev)**
 ISO 23251 Pressure-relieving and depressuring systems
 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
 ISO/TR 13624-2 Marine drilling riser system analysis
 ISO 13625 Marine drilling riser couplings
 ISO 19901-7 **Station-keeping systems for floating offshore structures (Amd)**
 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
 ISO 19902 Fixed steel offshore structures
 ISO 19903 Fixed concrete offshore structures
 ISO 19905-1 **Jack-ups (New)**
 ISO/TR 19905-2 **Jack-ups commentary**
 ISO 19906 **Arctic offshore structures (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
 ISO 13628-6 Subsea production controls
 ISO 13628-7 Completion/workover riser system
 ISO 13628-8 **ROT and interfaces (Rev)**

ISO 13628-9 ROT intervention systems
 ISO 13628-10 Bonded flexible pipe
 ISO 13628-11 Flexible pipe systems for subsea and marine applications
 ISO 13628-15 **Subsea structures and manifolds (New)**
 ISO 13628-16 **Spec for flexible pipe ancillary equipment (New)**
 ISO 13628-17 **RP for flexible pipe ancillary equipment (New)**

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 13085 **Tubing aluminium alloy pipes (New)**
 ISO 13500 **Drilling fluids (Amd)**
 ISO 13501 **Drilling fluids - processing systems evaluation (Rev)**
 ISO 13503-1 **Measurement of viscous properties of completion fluids (Rev)**
 ISO 13503-2 Measurement of properties of proppants
 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 **Casing and tubing connections testing (Rev)**
 ISO 13680 **CRA seamless tubes for casing and tubing (Rev)**

ISO 14310 Packers and bridge plugs
 ISO 15136-1 Progressing cavity pump systems
 ISO 15136-2 Progressing cavity pump systems - drive heads
 ISO 15463 Field inspection of new casing, tubing and plain end drill pipe
 ISO 15464 Gauging and inspection of threads
 ISO 15546 **Aluminium alloy drill pipe (Rev)**
 ISO 16070 Lock mandrels and landing nipples
 ISO 17078-1 **Side-pocket mandrels (Amd)**
 ISO 17078-2 Flow control devices for side-pocket mandrels
 ISO 17078-3 Latches & seals for side-pocket mandrels & flow control devices
 ISO 17078-4 **Side-pocket mandrels and related equipment (New)**
 ISO 17824 Sand control screens
 ISO 20312 **Design of aluminium drill string (New)**
 ISO 27627 **Aluminium drill pipe thread gauging (New)**
 ISO 28781 **Subsurface tubing mounted formation barriers (New)**

ISO 3183 Steel pipe for pipeline transportation systems
 ISO 12490 **Actuation, mechanical integrity and sizing for pipeline valves (New)**
 ISO/TS 12747 **Pipeline life extension (New)**
 ISO 13623 Pipeline transportation systems
 ISO 13847 Pipeline welding
 ISO 14313 Pipeline valves
 ISO 14723 Subsea pipeline valves
 ISO 15589-1 Cathodic protection for on-land pipelines
 ISO 15589-2 **Cathodic protection for offshore pipelines (Rev)**
 ISO 15590-1 Pipeline induction bends
 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 21809-1 **Polyolefin coatings (3-layer PE and 3-layer PP) (New)**
 ISO 21809-2 Fusion-bonded epoxy coatings
 ISO 21809-3 **Field joint coatings (Amd)**
 ISO 21809-4 Polyethylene coatings (2-layer PE)
 ISO 21809-5 **External concrete coatings (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 drilling fluids (Rev)**
 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
 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 2010

Standards in green are a priority for 2011 issue

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

AUTOMATION STANDARDS WORK

OGP Instrument and Automation Standards Subcommittee (IASSC) established in 2006 bring common oil & gas industry experiences into two IEC/TC65 standards:

- Revision of IEC 61511 Safety instrumented systems
- New IEC 62682 on Management of alarm systems.

The OGP WG for looking into IEC 61511 has collected national guideline experiences used by oil and gas companies as ISA 84.00.04, OLF 070 (Norwegian sector) and UKOOA/EEMUA/EIC (British sector) or other improvements from our industry.

The OGP WG for Alarm system has reviewed guidelines and standards as ISA 18.2, PSA

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 Make use of well over 150 new ISO standards for your own benefit!

YA 711, NAMUR NA 102 and EEMUA 191 in addition to company requirements to form input for a new IEC standard. IEC/TC65/SC65A/WG15 Alarm system is now established with IASSC report input launched into the standard work group for further work.

New topics are under development in IASSC for further similar contribution to IEC standards for our oil & gas industry.

STANDARDS ON CO₂ ASPECTS

PETROBRAS successfully proposed work in the area of ISO standards related to CO₂ aspects in view of subsurface equipment, topside equipment and pipeline systems.

The first proposal concerns development of a guide for selection of corrosion resistant materials used in CO₂ environment in the petroleum and natural gas industries. This document applies only to materials for seamless tubes, for use as casing, tubing and downhole equipments.

The second proposal is about development of a guide for the design and operation of petroleum and natural gas offshore platforms, dealing with streams

OGP lists of instrument & automation, coating, material and global standards are available online at: <http://info.ogp.org.uk/standards>

containing elevated levels of CO₂ at high pressures and high flow rates.

The third proposal involves revision of ISO 13623 (Pipeline transportation systems) proposes inclusion of more stringent requirements for CO₂ transportation based on DNV RP J202.

SUCCESS STORY – ADOPTION PROGRESS

In the last 12 months, Gulf Standards Organization (representing 6 Middle-East countries) has adopted 27 ISO standards, with a total of 77 adoptions. API has now (March 2011) adopted back some 76 of the ISO standards shown above, CEN adoptions is now at 135. These numbers represent growing consensus in the global oil & gas industry. With China, Brazil, Canada, Kazakhstan, Middle East, Russia, Ukraine and others adopting the same ISO standards, we are steadily progressing towards the vision:

GLOBAL STANDARDS USED LOCALLY WORLDWIDE

THE INTERNATIONAL STANDARDS BULLETIN

This bulletin is developed by the OGP Standards Committee, which includes members from: Addax, API, BP, CEN, Chevron, ConocoPhillips, China Petroleum Standards Committee (CPSC), Eni, Energy Institute, ExxonMobil, Gazprom, Inpex, ISO, Kuwait Oil, Marathon, MOL, Maersk, NCO, OMF, Pemex, PetroChina, Petrobras, Suncor, PETRONAS, PTTEP, Qatar Petroleum, RasGas, Repsol, Santos, Shell, Statoil, Total & Woodside.

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ARCTIC OFFSHORE STRUCTURES

ISO 19906 for Arctic offshore structures was published in December 2010. It specifies requirements and provides recommendations and guidance for the design, construction, transportation, installation and removal of offshore structures, related to the activities of the petroleum and natural gas industries in arctic and cold regions. Reference to arctic and cold regions in ISO 19906:2010 is deemed to include both the Arctic and other cold regions that are subject to similar sea ice, iceberg and icing conditions. The objective of ISO 19906:2010 is to ensure that offshore structures in arctic and cold regions provide an appropriate level of reliability with respect to personnel safety, environmental protection and asset value to the owner, to the industry and to society in general.

ISO 19906, together with ISO 19901-3 Topsides structure also published in December 2010, complete the set of "first editions" of the ISO 19900-series of codes for offshore structures. All these standards have been adopted as European Standards and will be used in parallel with the EuroCodes throughout Europe. API for the United States, CSA for Canada and GOST-R for Russia are also among those adopting these ISO Standards with the minimum modifications necessary to ease transition from their existing codes. Such transition takes time but all industry effort is now focussed on maintaining the ISO Standards such that future ISO editions will lead the way.

All the Arctic nations and many others with arctic knowledge have participated in the development of ISO 19906. The standard builds on the other ISO 19900-series documents with the provisions necessary for

arctic and cold regions. In particular, ISO 19906 provides the most up-to-date global consensus approach for defining ice event scenarios and for calculating ice actions on all types of offshore structures whether bottom-founded or floating. Further, ISO 19906 codifies for the first time such arctic structures as man-made islands and ice structures including ice roads. The new IEC code for wind turbine design refers to ISO 19906 for ice actions on offshore turbine supports in regions such as the Baltic Sea. Further information on ISO 19906 may be found in conference papers OTC 22068-22074 published by OTC at the Arctic Technology Conference, Houston, February 2011.

BARENTS 2020

Industry is already building on ISO 19906 as the basis for developing and codifying new knowledge and technologies for arctic offshore structures. In anticipation of imminent developments in the Barents Sea, authorities and industry in Russia and in Norway recognise the challenges facing the industry in this area due to low temperatures, harsh weather, ice, icing, darkness, lack of infrastructure and special need to protect the environment. They are now cooperating on the development of harmonised offshore standards and guidelines under the Barents 2020 project. Launched in 2008, Barents 2020 is addressing the challenges with the working assumption that operations in the Barents Sea should be at least as safe as those in the North Sea. Phase 4 will complete at end 2011 with guidance for ice actions on floating structures, for EER (Escape, Evacuation and Rescue), working environment and safety related to human performance and decision making (human factors) for operations, emissions and discharges to air and water.



ABOUT OGP

The International Association of Oil & Gas producers (OGP) encompasses most of the world's leading publicly traded, private and state-owned oil & gas companies, oil & gas associations and major upstream service companies. OGP members operate in more than 80 different countries and produce more than half the world's oil and about one third of its gas.

The association was formed in 1974 to develop effective communications between the upstream industry and an increasingly complex network of international regulators.

An essential part of OGP's mission is to represent the interests of the upstream industry to international regulators and legislators.

OGP also helps members achieve continuous improvement in safety, health and environmental performance, and in the engineering and operation of upstream ventures. OGP's extensive international membership brings with it a wealth of know-how, data and experience. OGP committees and task forces manage the exchange and dissemination of this knowledge. OGP

additionally promotes awareness of Corporate Responsibility issues such as transparency of revenues and combatting corruption.

The OGP Standards Committee monitors, co-ordinates and influences the development of International Standards to meet the needs of OGP members. There is close communication with national, regional and International Standards bodies, particularly the API, CEN, GOST, GSO and ISO. Information on the activities of the OGP Standards Committee and other OGP committees, including freely downloadable publications produced by the OGP, can be accessed via the OGP website at www.ogp.org.uk.

OGP POSITION ON STANDARDS

OGP has been a catalyst in the industry's approach to standards and strongly supports the internationalisation of key standards used by the petroleum and natural gas industries.

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.

The adoption of this approach is expected to minimise technical barriers to trade, enable more efficient worldwide operations, and improve the technical integrity of equipment, materials, and offshore structures used by the petroleum and natural gas industries.