



ISO/TC 67

Materials, equipment and offshore structures for  
petroleum, petrochemical and natural gas industries

**ISO/TC 67 N 1119**

1 March 2011

## **ISO/TC 67 Management Committee AHG Industry Events (ISO/TC 67 MC N088) Action Plan on Recent Industry Events**

**Proposed ISO/TC 67 programme for drilling, well construction and well operations standards, resulting from the Montara and Macondo accidents.**

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### **1. Introduction**

Following the Montara and Macondo accidents ISO/TC 67 decided at its plenary meeting in October 2010 to establish an Ad-hoc Group (AHG) in its Management Committee (MC) with the scope:

“To prepare a roadmap/action plan on ISO/TC 67 standards which should be revised or developed in response to the latest accidents (Montara (West Australia) and Macondo (US Gulf of Mexico)).”

This AHG was asked to report on their proposals to the ISO/TC 67 Secretariat no later than December 31st 2010, such that the MC could discuss and agree on the action plan at their meeting in Brussels, in February 2011 and to report to ISO/TC 67 accordingly. The report was agreed by the MC on 9 February 2011.

This AHG report provides a proposed programme of standards development activities for ISO/TC 67 to address the lessons learned from these accidents in so far that they relate to international standards. In addition a list is provided of standards/documents relevant to the two accidents that are available for use now.

## 2. Public reports and studies ongoing (from where input has been taken)

The AHG has taken input from the ISO/TC 67 Subcommittee chairs, and Working Group convenors. The AHG has examined the current work programme of ISO/TC 67, and the work programmes of other standards developing organizations, most importantly API. Representatives of the AHG have collaborated with the work of OGP's GIRG (Global Industry Resource Group), which will publish its recommendations in Q1 2011. Representatives of the AHG have had discussions with representatives from the IRF (International Regulators' Forum). Specifically, the following key documents have been analyzed:

- Montara Commission of Inquiry Report, Commissioner David Borthwick, 17 June 2010.
- National Academy of Engineering (NAE) and the National Research Council (NRC), *Interim Report on Causes of the Deepwater Horizon Oil Rig Blowout and Ways to Prevent Such Events*, 16 November 2010.
- The Bly (BP) Report, *Deepwater Horizon, Accident Investigation Report*, September 8 2010.
- European Commission (EC) communication to the European Parliament and the Council, *Facing the challenge of the safety of offshore oil and gas activities*, 12 October 2010.
- The Deepwater Report to President Obama, *The Gulf Oil Disaster and the Future of Offshore Drilling*, National Commission on the BP Deepwater Horizon, January 2011.
- BOEMRE (the US offshore regulator, Bureau of Ocean Energy Management, Regulation and Enforcement), *Drilling Safety Rule*, Federal Register/Vol. 75, No 198/14 October 2010.
- BOEMRE, *Safety and Environmental Management Systems (SEMS) Rule*, Federal Register/Vol. 75, No 199/15 October 2010.
- BOEMRE, *Notices to Lessees (NTL)*.

Since all this information is publicly available, this AHG report does not provide summaries of the above documents, rather it goes directly to the proposals in Table 1.

It should be noted that over time, further analysis and documentation of the accidents will become available. This ISO/TC 67 proposal should therefore be seen as part of an evolution of the digestion of the lessons learned from them.

## 3. Proposed programme of standards development activities for ISO/TC 67

Table 1 provides a proposed programme of standards development activities for ISO/TC 67 to address the lessons learned from the two accidents in so far that they relate to international standards. This table follows the organizational structure of ISO/TC 67, listing the proposed activities firstly for the Working Groups (WGs) which report to the Technical Committee (TC) itself, and then for the Subcommittees (SCs) with their WGs. Only groups that have proposed activities are listed. For each subject (existing or proposed document), its status and summary of proposed action is given together with an indicative (relative) priority. A number of the high priority subjects are already being addressed in API, which is indicated accordingly. The proposed ISO/TC 67 activity for these subjects is generally to adopt the outcome of the API work into ISO. A number of the relevant ISO/TC 67 standards are already in development or revision, i.e. already on the active ISO/TC 67 work programme. The proposed ISO/TC 67 activity here is to ensure that the lessons learned from the two accidents are properly incorporated in this work.

#### **4. Standards/documents for drilling, well construction and well operations available for use now**

Table 2 provides a list of those standards/documents for drilling, well construction and well operations relevant to the two accidents that are available for use at the end of December 2010. This list is not exhaustive. There are many other standards/documents for drilling, well construction and well operations, but these are not relevant to the two accidents and consequently not listed. These can be searched on the websites of ISO, IEC, API and other national and regional standards organizations.

#### **5. Conclusions**

To carry out the activities proposed in Table 1 will require considerable effort and resources. Some of these activities can be seen as typical ongoing work of ISO/TC 67, and as such the resources are generally available. This is particularly true for the equipment or product standards. Other proposed potential subjects are new: for example the "Wells integrity - umbrella document"; the "Development and implementation of HSE management systems" and "competence of personnel". If agreed, these will require new resources from the interested stakeholder groups. The ISO/TC 67/MC agreed to assign a small task force to look after and support these aspects.

In the Macondo and Montara accidents, our industry lost 11 colleagues, 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 defence against such accidents. In order to continue with this, it is now essential that the recommendations identified in this report are implemented in the international standards portfolio.

This AHG report demonstrates the need for "global standards used locally worldwide" (ISO/TC 67's vision statement). As an international industry, the lessons learned from an accident in one country must be transferred globally. International standards developed by ISO/TC 67 are one way of achieving this.

The preparation of this AHG report has also demonstrated the value of direct communication between the multidimensional stakeholders. These stakeholders include: countries involved in the international oil industry; oil companies; equipment manufacturers; contractors; national regulators; certification bodies; professional and trade associations; standards organizations. These stakeholders shall all be involved and engaged in the ongoing work.

Finally, developing and maintaining consensus based international standards is only the first step. These remain only as paper and electronic documents, until implemented in or by a particular country project or user. Ongoing work is required to facilitate this use.

#### **6. Recommendations**

The following recommendations are supported by the ISO/TC 67/MC:

- a) The ISO/TC 67/MC supports the proposals in Table 1 and arranges that they will be carried out;
- b) Users of standards for drilling, well construction and well operations should examine the documents listed in Table 2 for application in their activities.

**Table 1:**  
**Proposed ISO/TC 67 programme for drilling, well construction and well operations standards, resulting from the Montara and Macondo accidents**

Number	Title	Latest edition	Status	Proposed ISO/TC67 action	Priority
<b>ISO/TC67/WG2 – Conformity assessment</b>					
No number	Competence of personnel		Sourced from Recommendations 62 & 63 of Montara report	As quoted in the Montara report: "Consider how to address the international standards implications of the following issue: Licensees, rig operators and relevant 3rd party should develop well control competency standards for key personnel in other entities involved. Achievement and maintenance of well control should be written into the job responsibilities of key personnel". See also ISO CD 10018.	1
<b>ISO/TC67/WG4 - Reliability engineering &amp; technology</b>					
ISO TR 12489	Reliability modelling and calculation of safety systems		Planned issued end 2011	Proceed standardization activities as already planned	2*
<b>ISO/TC67/SC3 – Drilling and completion fluids, and well cements</b>					
<b>ISO/TC67/SC3/WG2 – Cementing</b>					
ISO 10426-2/ API Spec 10B-2	Testing of well cements	2003/2005	ISO in revision	Fully reconsider the in-situ test situation. This part of ISO 10426 specifies methods and gives recommendations for the testing of cement slurries and related materials under simulated well conditions.	1*
ISO 10426-3/ API RP 10B-3	Testing of deepwater well cement formulations	2003	Published in 2003	Consider revision	2*
API Std 65-2	Isolating Potential Flow Zones During Well Construction	2010	Published 10 Dec 2010	Consider adopting in ISO. Will be discussed at ISO/TC67/SC3/WG2 meeting on 27 January 2010.	1

Number	Title	Latest edition	Status	Proposed ISO/TC67 action	Priority
No number	RP for design and testing of foam cement slurries		Sourced from Recommendation in Bly (BP) report	Bly report recommends making new API RP. Will be discussed at ISO/TC67/SC3/WG2 meeting on 27 January 2010. Make joint API/ISO standard? See also ISO 10426-4.	1
New	Design and Manufacture of Float Equipment		Does not exist	Consider to make a standard for design and manufacture of float equipment. Will be discussed at ISO/TC67/SC3/WG2 meeting on 27 January 2010. See also ISO 10427-3.	2
<b>ISO/TC67/SC4 – Drilling and production equipment</b>					
<b>ISO/TC67/SC4/WG2 – Drilling well control equipment</b>					
ISO 13354/API RP 64 not (yet) co-branded	Shallow gas diverter equipment/Diverter Systems Equipment and Operations	2001/2001	ISO in revision; resource constrained to finish.	Once revised by ISO, fast-track adopt in API. Lower priority than API RP 53	3*
ISO 13533/ API Spec 16A	Drill through equipment (BOPs)	2001/2004	API in revision	Once revised by API, fast-track adopt in ISO. Review whether repair and remanufacture is sufficiently covered.	1
ISO 16339	Well control equipments for HPHT (High Pressure High Temperature) drilling operations	New	New Work Item	Complete work in ISO; petition API for using PER15K-1 as source.	3*
ISO 22830/API Spec 16D	Control systems for drilling well control equipment and diverter systems	2004/2004	API in revision	Once revised by API, fast-track adopt in ISO	2
API Spec 16C	Choke and kill systems	1993	API in revision	Once revised by API, fast-track adopt in ISO	2
API Std 53	BOP equipment systems for drilling wells	1997	In revision under API DPO Com; API RP53 is referenced in USA 30CFR 250.446	Once revised by API, fast-track adopt in ISO. To be Std not RP.	1

Number	Title	Latest edition	Status	Proposed ISO/TC67 action	Priority
API RP 59	Well Control Operations	2006	In revision under API DPO Com; resources tied up in RP53.	Once revised by API, fast-track adopt in ISO. Consider if RP59 needs an explicit section on volumetric monitoring to identify influxes during displacements	2
API RP 90	Annular Casing Pressure Management for Offshore Wells	2006	In revision under API DPO Com; resources tied up in RP53.	Once revised by API, fast-track adopt in ISO	2
API TR PER15K-1	HPHT Design Verification and Validation	New	New TR being drafted.	Once revised by API, fast-track adopt in ISO as part of HPHT Well Control Equipment. Ref ISO 16339 work	2
<b>ISO/TC67/SC4/WG4 – Production equipment</b>					
ISO 14998	Completion accessories	New	New std being drafted in ISO	Once revised by ISO, adopt-back by API	3*
ISO 16530	Well integrity in the operational phase	New	New std being drafted in ISO	Once revised by ISO, adopt-back by API. Check if hydraulic workover units and coiled tubing units are fully covered	1*
No number	Well integrity - Umbrella document	New		Consider ISO new standard. Scope to be determined. Our industry could well use an overall ISO umbrella standard for Well Integrity based on relevant elements from the new US DOI BOEMRE rules, OGP CIRG recommendations, NORSOK D-010, etc. and with normative references to API/ISO standards in revision or development. This also addresses the recommendation in the Interim report from the National Academy of Engineering and National Research Council, (2010-11-16) that points to apparent lack of standard industry practice for a systems approach in assessing the full range of factors affecting safety of drilling operations. Aim to publish ISO TR late 2011 or early 2012.	1
<b>ISO/TC67/SC4/WG? – Potential new WG for Well integrity</b>				Need to determine need for and where this potential new WG fits in TC67 organization. Discuss at next ISO/TC67/MC meeting	3
API RP 96	Deep water well design considerations	New	New API RP being drafted. Ballot Feb/Mar 2011.	Once revised by API, fast-track adopt in ISO. Check if production casing cementing is covered. Check if negative pressure test of casing shoe is covered. Check if hydraulic workover units and	1

Number	Title	Latest edition	Status	Proposed ISO/TC67 action	Priority
				coiled tubing units are covered.	
<b>ISO/TC67/SC4/WG6 – Subsea equipment</b>					
ISO 13628-8/API 17H	Remotely operated tools and interfaces on subsea production systems	2002/2004	ISO in revision	Once revised by ISO, adopt-back by API	1*
<b>ISO/TC67/SC6 – Processing equipment and systems</b>					
<b>ISO/TC67/SC6/WG1 – Offshore platform systems</b>				Determine whether the scope of this WG needs expanding. Discuss at next ISO/TC67/MC meeting	2
ISO 10418	Basic surface process safety systems	2003	In revision	Also to aim to allow API RP 14C to be able to adopt as next revision of API RP 14C	2*
ISO 13702	Control and mitigation of fires and explosions on offshore production installations	1999	In revision	Expand scope to cover MODUs? Discussion ongoing in ISO/TC67/SC6/WG1.	2*
ISO 15544	Requirements and guidelines for emergency response	2000		Review to check need for revision, after ISO 10418 and ISO 13702. Include MODU blowout scenario	3
ISO 17776	Guidelines on tools and techniques for hazard identification and risk assessment	2000		Review to check need for revision, after ISO 10418 and ISO 13702	3
OGP 210	Guidelines for the development and application of HSE management systems	1994	In revision	Propose to make new ISO standard on the basis of OGP Report 210, IPIECA document, API RP 75 and new US Federal Register/Vol. 75, No 199/15 Oct 2010, (Safety and Environmental Management Systems; Final Rule) 30 CFR Part 250.	1

Number	Title	Latest edition	Status	Proposed ISO/TC67 action	Priority
NORSOK Z-013	Risk and emergency preparedness analysis	2010		Propose to make new sector specific ISO standard based on NORSOK Z-013, building on ISO 31000. Check gaps/overlaps with ISO 17776	1
IMO MODU Code	Mobile Offshore Drilling Units	2009		Consider whether to approach IMO to propose that this MODU Code should make references to relevant ISO standards from ISO/TC67/SC6/WG1, instead of the provisions in the code. This will align the requirements for drilling plants on fixed and mobile installations.	2

#### ISO/TC67/SC7 – Offshore Structures

#### ISO/TC67/SC7/WG5 – Floating systems

ISO 19901-7	Stationkeeping systems for floating offshore structures and mobile offshore units	2005	In revision	Ensure standard adequately covers the stability of the drilling vessels, and that the vessel's movements (intact or in damage condition) nor ultimate capsizes could not harm the drilling riser.	2*
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#### Miscellaneous

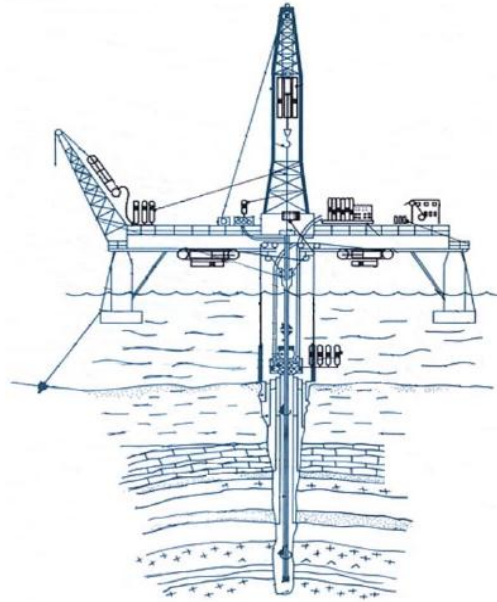
OGP Report 435	Safety culture	2010	Interim report from National Academy of Engineering and National Research Council, 2010-11-16	Liaise with OGP to explore ways to establish international standards (arrange workshops) to foster continuous improvement in safety culture.	1
Determine need for potential new Work Group	Inspection. General approach to in-service inspection			Consider what is generically needed to be documented in international standards, and how to address; specifically in relation to in-service inspection. Discuss at next ISO/TC67/MC meeting.	2

Priority: Ranking Priority 1/2/3 (1 most important) where "\*" means already on ISO/TC67 plan.



**Table 2: Standards for drilling, well construction and well operations, relevant to the Montara and Macondo accidents. Available for use end December 2010 (unless stated as in development)**

- API TR PER15K-1 HPHT Design Verification and Validation (in development)
- API Spec 16A /ISO 13533 Drill through equipment (BOPs) (API in revision)
- API Spec 16C Choke and kill systems (in revision)
- API Spec 16D/ISO 22830 Control systems for drilling well control equipment and diverter equipment (API in revision)
- API Spec 16RCD Drill Through Equipment Rotating Control Devices
- API RP 53 BOP equipment systems for drilling wells (in revision)
- API RP 59 Well Control Operations
- API RP 64 Diverter Systems Equipment and Operations
- API RP 65 Cementing Shallow Water Flow Zones in Deepwater Wells
- API Std 65-2 Isolating Potential Flow Zones During Well Construction (in revision)
- API RP 90 Annular Casing Pressure Management for Offshore Wells
- API Bull 96 Deep water well design considerations (in development)
- DNV OS-C101 Drilling plant
- ISO TR 10400/API TR 5C3 Equations and calculations for the properties of casing, tubing drill pipe and line pipe used as casing or tubing
- ISO 10405 Care and use of casing and tubing
- ISO 10423/API Spec 6A Wellhead and Christmas tree equipment
- ISO 10426-1/API Spec 10A Cements and materials for well cementing
- ISO 10426-2/API Spec 10B-2 Testing of well cements (in revision)
- ISO 10426-3/API Spec 10B-3 Testing of deepwater well cement formulations
- ISO 10426-4/API Spec 10B-4 Preparation and testing of foamed cement slurries at atmospheric pressure
- ISO 10426-5/API Spec 10B-5 Determination of shrinkage and expansion of well cement formations at atmospheric pressure
- ISO 10426-6/API Spec 10B-6 Methods of determining the static gel strength of cement formulations
- ISO 10427-3/API RP 10F Performance testing of cementing float equipment
- ISO 11960/API Spec 5CT Casing and tubing for wells (in revision)
- ISO 11961/API Spec 5D Steel drill pipe
- ISO TR 12489 Reliability modelling and calculation of safety systems (in development)
- ISO TR 13881 Classification and conformity assessment of products, processes and services >>>continue on column on right side>>>



- API RP 75 Development of a Safety and Environmental Management Program for Offshore Operations and Facilities
- API Bull 97/ IADC Well Construction Interface Document (in development)
- IADC HSE Case guidelines for MODUs
- IADC Deepwater Well Control guidelines
- IEC 61892-7 Mobile and fixed offshore units - Hazardous areas
- IMO MODU (Mobile Offshore Drilling Units) Code
- ISO 10418 Basic surface process safety systems (in revision)
- ISO 13702 Control and mitigation of fires and explosions on offshore production installations (in revision)
- ISO 15544 Requirements and guidelines for emergency response
- ISO 17776 Guidelines on tools and techniques for hazard identification and risk assessment
- ISO 28300/API Std 2000 Venting of atmospheric and low-pressure storage tanks (in revision)
- ISO 23251/API Std 521 Pressure relieving and depressuring systems (in revision)
- NORSOK Z-013 Risk and emergency preparedness analysis
- OGP 210 HSE Management system (in revision)
- OGP 415 Asset integrity
- OGP 435 HSE culture tools

- ISO 13354 Shallow gas diverter equipment
- ISO 13624-1/API RP 16Q Design, selection and operation of marine drilling riser systems
- ISO 13625/API 16R Marine drilling riser couplings
- ISO 13628-1/API RP 17A Design and operation of subsea production systems (in revision)
- ISO 13628-2/API Spec 17J Unbonded flexible pipe systems for subsea and marine applications
- ISO 13628-4/API Spec 17D Subsea wellhead and tree equipment
- ISO 13628-5/API Spec 17E Subsea umbilicals
- ISO 13628-6/API Spec 17F Subsea production control systems (in revision)
- ISO 13628-7/API RP 17G Completion/workover riser systems (in revision)
- ISO 13628-8/API RP 17H Remotely operated tools and interfaces on subsea production systems (in revision)
- ISO 13628-11/API RP 17B Flexible pipe systems for subsea and marine applications
- ISO 13679/API RP 5C5 Procedures for testing of casing and tubing connections (in revision)
- ISO 13680/API Spec 5CRA CRA casing and tubing
- ISO 14224/API Std 689 Collection and exchange of reliability and maintenance data for equipment
- ISO 14310/API Spec 11D1 Packers and bridge plugs
- ISO 14998 Completion accessories (in development)
- ISO 16339 Well control equipments for HPHT (High Pressure High Temperature) drilling operations (in development)
- ISO 16530 Well integrity in the operational phase (in development)
- ISO 19901-6/API RP 2MOP Marine operations
- ISO 19901-7 Stationkeeping systems for floating offshore structures and mobile offshore units (in revision)
- ISO 19904-1 Floating offshore structures - Monohulls, semi-submersibles and spars
- ISO 20815 Production assurance and reliability management
- ISO 28781 Subsurface barrier valves and related equipment
- NORSOK D-001 Drilling facilities
- NORSOK D-002 System requirements well intervention equipment
- NORSOK D-SR-007 Well testing system
- NORSOK D-010 Well integrity in drilling and well operations (considered in API 96 and ISO 16530)
- OLF 117 Well integrity guideline



ISO/TC 67 N1119 <i>Action Plan on Recent Industry Events</i>	
Source	ISO/TC 67 Management Committee AHG <i>Industry Events (MC N 088)</i>
Committee	ISO/TC 67 <i>Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries</i>
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