Paper

"The involvement of IRF in setting standards and best practices"

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September 2011: Prepared by Steve Walker (UK) and Jan de Jong (NL)

The involvement of IRF in setting standards and best practices.

Preamble

Following the impact of both the Montara and Macondo blowouts, the importance of the offshore industry having comprehensive sets of standards has been emphasised, and the drive towards much greater consistency of safe practice worldwide, particular in the drilling community, has been highlighted.

Whilst it is industry that will utilise and put standards into operation, those standards are used in a variety of ways in national regulatory systems. Offshore regulators (whether on safety or environmental aspects) therefore have an important role in the standards process, whether selecting topics for standardisation, in actually helping to develop standards themselves, or in using completed standards within the regulatory landscape.

The International Regulator Forum (IRF) is the principal international regulator forum for offshore safety. IRF is the network of senior "mature" offshore safety regulators, and has been in existence since 1994, IRF comprises offshore regulators from US, Canada, UK, Norway, Netherlands, Brazil, Australia, New Zealand, Mexico and Denmark. The Terms of Reference of IRF are on the IRF website and are:

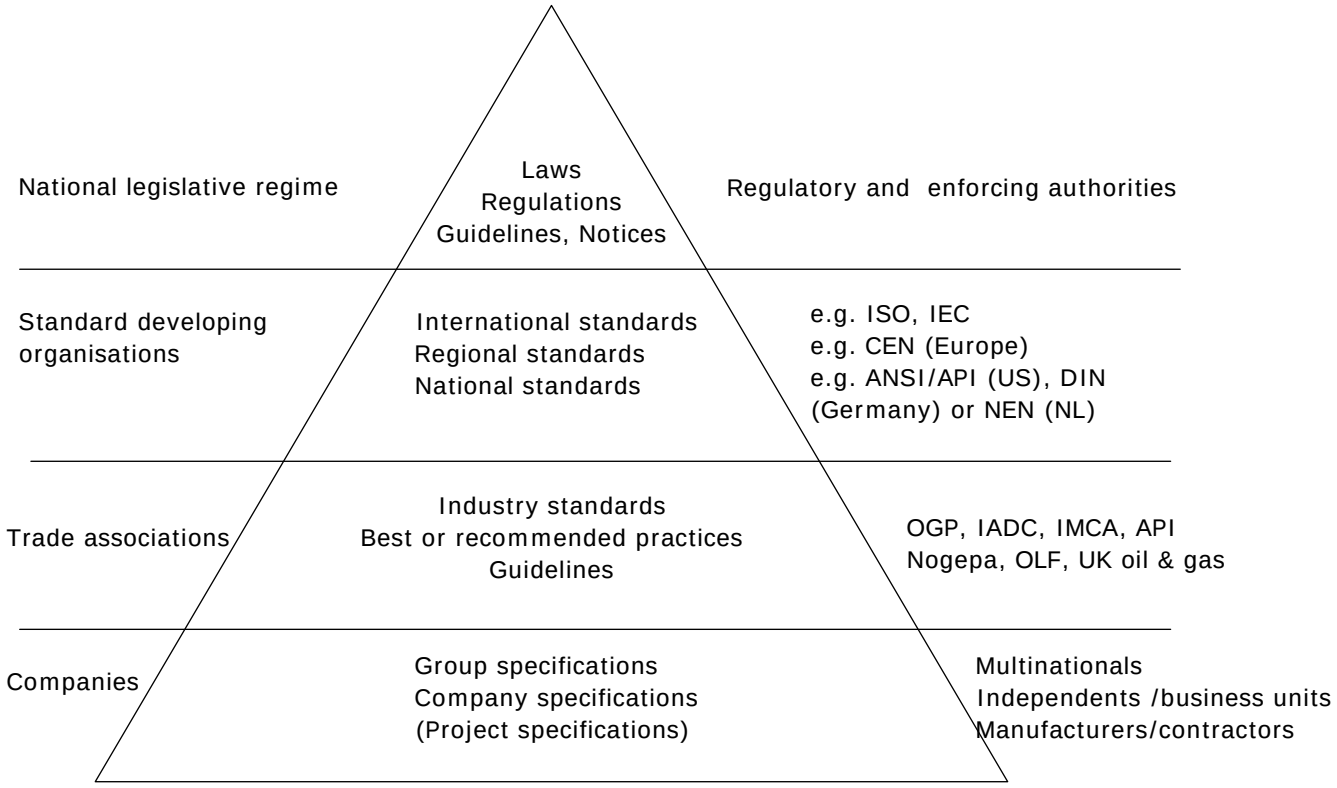
- To promote best sustainable safety practise
- To enable an exchange of information between regulators
- To provide a network of heath and safety regulators for mutual support and advice.

IRF has prepared this paper as a basis for discussions at the IRF Summit Conference 2011. It summarises the current use of standards within regulatory environment, and proposes ways in which IRF can do more.

1. Introduction on standards and standardisation

The term "standard" has many definitions, but for the purpose of this paper standards are considered to be technical documents which serve as an authoritative reference. Standards can be, and are, produced at a number of levels and from a variety of sources, acquiring particular force and importance if they are endorsed by national or international organisations. This hierarchy is explained in Figure 1 below:

Figure 1: Hierarchy of standards



Standards are like DNA. They are the basic building blocks for all technology and economic systems and may relate to such issues as material/product specification, process and management systems and practises, terminology, and methods of measuring, testing, analysing or sampling. Standards can provide a common reference point for an industrial product or activity, protect consumer interests through adequate and consistent quality of goods and services, promote economy in human efforts, materials, and energy in the production and exchange of goods, and promote trade by the removal of barriers caused by differences in national practices. They also enhance technical integrity.

In the context of this paper, though, the key benefit of standards is to promote safety, health and the protection of the environment by providing consistent, authoritative advice which, if adopted, should ensure some level of ”acceptable” worker and environmental protection. This is especially important for the E&P industry because of the global nature of that industry, its workforce and its contractors - developing standards together is an efficient alternative for every company making their own standards and enables supply or movement of equipment and materials across national borders. By using common globally accepted international standards to provide a “level playing field” between countries, particularly useful for mobile drilling units who can easily move around the world. This issue has come under close scrutiny post-Macondo, with the clearer realisation that the consequences of a major offshore incident in terms of oil pollution could cross national borders.

Within the offshore industry, much equipment and material and associated practices have been addressed by the American Petroleum Institute (API) *Recommended Practices, Standards and Specifications.* Although originating in the US, API standards have traditionally been used globally in conditions and for applications similar to those found in US operating areas – however, they predominately refer to equipment specifications. There are a number of other significant bodies of regional, national and industry standards (e.g. CEN or NORSOK) which are also used outside the original sphere of origin.

The International Organization for Standardization (ISO) provides an international dimension to standards, with the main offshore focus being Technical Committee 67 (ISO/TC67) and it's various Subcommittees and Working Groups [see Annex 1 provided by ISO]. Over half of the standards developed by ISO/TC 67 have been based on the content of API standards as a starting point - drafts developed this way thus receive the input and comments from outside API that then enrich the global relevance of the standards. Where it has not been possible to obtain total agreement on certain standards a national or regional annex can be added. There are some countries that do not wish to make reference to US standards, so the idea of supplementing a "core" agreed to standard with an annex will continue as a mechanism to address certain regional or domestic needs.

Also, the International Electrotechnical Commission (IEC) provides internationally agreed standards for electrical equipment and installations that are relevant to, and widely used by, the offshore industry. Technical Committees 18 (Electrical installations of ships and of mobile and fixed offshore units), 31 (Equipment for explosive atmospheres), 44 (Safety of machinery) and 65 (Industrial process automation and control) all provide standards that are relevant to the offshore industry. In any cases these IEC standards underpin the effective application of the ISO/TC 67 standards.

The International Maritime Organization (IMO) is a third body with international involvement in setting standards relevant to the offshore industry. In this case, though, their remit is limited to marine integrity issues of MODUs rather than the standards of relevant to operational issues of such vessels when engaged in drilling or production operations.

The vast majority of the standards developed by standard development organisations (SDOs) are equipment/material standards, with the number of operating/process standards being very limited. The development of "Codes of Practises", which detail recommended systems of working rather than design or material characteristics, have up until now have primarily originated from national and international trade associations such as IADC, OGP, Oil & Gas UK etc. This is changing, with ISO (and API) now looking much more closely at issues of competence, risk analysis, management systems etc.

2. How do regulators currently use standards?

National legislation for the oil and gas industry is set by national regulators. This inevitably leads to differences in regulations across the globe – both in style and in content - as they are written by different people of different background and culture, with different legal systems and different regulatory expectations. The range of the style and content of the legislation varies enormously, from very general, through goal setting, to strong prescription. Similarly, the level of actual enforcement of those national laws also has a broad spectrum. However, what unites regulators across the world is that regulators use standards in some way to whilst defining their schemes, regulations, guidelines or other regulatory documents. The hierarchy of these documents is typically as shown in Figure 1 above. Typically, the legal enforceability of these documents generally decreases as one goes from laws and regulations down to company level policies and standards. The way in which regulators reference standards varies as well, with some directly referring to dated standards as the mandatory standard to be adopted, whereas others may reference undated standards in guidance to assist industry commonly in more goal setting regimes.

In Europe EU Product Safety Directives (many of them supported by CEN/CENELEC harmonised standards) are made national regulations in all member states.

The regulator and not the operator decides whether a standard meets the regulatory intent within their own jurisdiction.

OGP surveyed the variation amongst fourteen regulators on their use of on standards in 2009/10. The main findings of the subsequent report "Regulators' use of standards"[2] were:

1. Regulators make good use of standards. 1,348 references to standards in total were identified, to 1,140 different, individual standard titles. In these numbers Russia was not included and China had no specific references;
2. Of these 1,140 different standards, 989 (87%) were referenced by one regulator only. Only 13% of the standards to be referenced by two or more regulators;
3. The standards emanated from more than 60 different international, regional, national and industry standards developing organisations around the globe. There was a dominance of references to industry standards (44%), compared to national standards (35%) and international standards third (21%);
4. Compared to an earlier analysis in 1996, there had been a significant increase in the reference to international standards and a sharp decrease in references to national standards;
5. API standards were dominating, with 225 references, including 49 API Manual of Petroleum Measurement (MPMS) standards;
6. 152 ISO standards were referenced by the regulators, with 59 of those coming from the work of ISO/TC 67;
7. the regional source of the referenced standards is 40% from SDOs in America, 24% from Europe, 21% are international standards and 15% emanates from SDOs in India, Australia and New Zealand;
8. Different regulators referenced different standards which covered the same subject and thus duplicated each other. Examples of these are in the subject areas of offshore structures and pipelines;
9. most of the references are to undated revisions of standards, whereas some regulators, e.g. PSA, US MMS (now BOEMRE) and USCG make reference to dated revisions only;

This important report showed 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. However, 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. The report considered that the duplication of standards should be looked into for harmonization, with the objective of reducing the number of standards covering the same subject - whilst the references to international standards by the regulators on a global basis had increased to 21%, there was still more international standardisation effort to be done. The subsequent drive for greater consistency of approaches and greater standardisation post-Macondo/Montara highlights the size of this particular issue. Additional, and updated, industry views on this issue is given in Annex 2, provided by OGP

3. How can regulators contribute to the standard setting process?

The role of individual national offshore regulators in their national, regional or international standards setting process does vary. Overall, though, regulators take the approach that the main beneficiaries of such standards are the E&P industries themselves, so the principal resource in developing standards should be from the industry. However, where standards are suitable for being referenced in a safety or environmental legislative regime, there is often a minimum involvement by the national offshore regulator to ensure consistency and suitability for that particular national regime, often via links with the national standards development organisation (SDO) or with the national offshore trades association (to some extent).

There are several reasons why regulatory authorities should be involved with the standards development process and in the promotion of standards:

1. the use of transparent and mutually developed consensus standards enhances technical integrity, improves safety, reduces environmental damages and enables supply or movement of equipment and materials across borders. That is certainly the case for the E&P industry because of the global nature of that industry, its workforce and its contractors;
2. standards and in particular internationally recognised standards are an alternative to prescriptive legislation. Such an approach can be particularly effective if there is an enforceable mechanism in the regulations that requires compliance with the standards;
3. standards agreeable to the regulators can reduce the need for regulatory document text;
4. using common globally accepted international standards provides a "level playing field" between countries, and can be used to demonstrate the removal of technical barriers to trade with the WTO. For example not to make national resources unattractive to investors as a result of "tight" regulations. Note that this is likely a political decision rather than a safety or environmental decision by the regulator;
5. the application of international standards will make for much easier transfer of mobile facilities between different regulatory regimes, thereby easing the burden on regulators;
6. it is inevitably much easier for a regulator to amend guidance than it is to amend the supporting legislation, so it is possible new developments in technology or best practice can be more quickly accommodated by referring to standards. This approach, though, may not work so well for those regulators whose legislation requires the specification of specific dated standards.

Post-Macondo, there has been a wide demand from a number of voices for adoption of standards which are applicable across the offshore industry, and so the emphasis of the need for globally accepted best practices and standards has grown. From some quarters there have also been clear expectations of the need for some level of approval and involvement by offshore regulators (including IRF as a body) in the development and setting of such international offshore safety and environmental standards.

From the work done in the project so far, it seems clear that ISO are the only body that is able to deliver globally agreed standards (apart from IEC with respect to electrical equipment). ISO has a funded and agreed process at national levels to develop ISO standards and to seek "conversion" of national of regional standards into such a globally accepted form. It is acknowledged that different countries have different systems, for example the US which has a preference for referencing domestically developed standards issued by SDOs such as API, ASME etc. Hence it is accepted that some legislative regimes will require some level of national or regional standards. However IRF members should encourage their regimes and their own priorities so that the ultimate goal is to have a comprehensive suite of ISO standards, and to seek to put forward national and regional requirements into the ISO process;

Proposal 1: that, at its meeting on 6 October, IRF should formally commit to supporting the ISO standards system as the principal one for offshore regulators to support (whilst recognising the role of IEC for electrical standards offshore).

As part of the work to develop this paper, IRF started engagement with the Chair of ISO Technical Committee 67 (ISO/TC 67) which is the ISO technical committee responsible for standards for the petroleum and gas industries (see Annex 1). That dialogue helped to inject some IRF priorities into the action plan for ISO/TC 67 resulting from the Macondo and Montara incidents (Ref 1), but that one-off IRF involvement ought to become more permanent.

Proposal 2: that, at its meeting on 6 October, IRF creates a standing IRF sub-group with the following remit:

(a) to set clear priorities for ISO standards (whether in general topics, in specific work streams, or general scope);
(b) to monitor the progress of the development of relevant ISO/IEC standards to ensure that regulatory concerns are identified at an early stage (but limited to the generality of a

particular standard rather than being involved in the precise development of the standard itself);
(c) to engage with ISO/TC67 Management Committee to present IRF needs and views on ISO standards (with the chair of this IRF group representing IRF at ISO TC MC/plenary)
(d) to engage with the OGP Standards Committee to present IRF views
(e) to formally analyse the gaps in international standards arising out of the Macondo and Montara reports and any national work (e.g. OSPRAG in UK, OLF in Norway); and
(f) to influence management of international standards to cater for IRF members' needs;

However, members of IRF also take an active part in key international standards development via their own national standards development organisation decision-making process (e.g. for Norway, PSA engages with Standards Norway and the Norwegian Electrotechnical Committee), with the subsequent national position going into ISO. This should continue, as it provides the national vehicle for the views of an individual IRF member to be progressed. There are times when IRF members will thus be involved in the detailed development of a standard to guard against a consensus approach that may lead to a lowest common denominator. By taking part in the detailed drafting as a member of a national SDO, or review draft standards during ballot, individual IRF members can also identify how a particular standard will fit into, or not fit into, their national legislation.

IRF members join in other standards work as appropriate. However, IRF members have different approaches in how they get involved in the standards process, at national, regional and international level. Therefore, there could be more transparency amongst IRF members:

(a) to be clear who is involved in what standards; and

(b) to provide an opportunity to learn from each other about how to ensure that a regulatory view is being considered during the standards process.

Proposal 3: that, at its meeting on 6 October, IRF considers developing a questionnaire for IRF members so that it is clear what each member does. This should include the different practices used by national regulators in referencing standards.

The OGP report (Ref 2) identified the wide range of standards referenced by individual national legislative regimes. Post-Macondo, there has been a drive for greater standardisation of safe practices in the international offshore industry, and although the long term goal of a comprehensive suite of ISO standards should be the long term goal (see Proposal 1 above) this will take time.

Proposal 4: that, at its meeting on 6 October, IRF considers what further action it should take in response to the OGP Report "Regulators' Use of Standards", and in particular to consider whether there was a need for IRF to create a further list (formal or informal) of useful and/or "recognised" international standards.

4. What should be the role of IRF in setting best practise?

Learning from incidents and accidents have always found their way into industry standards, and, where necessary, regulations.

Since Deepwater horizon there has been discussion at political, regulator and industry levels about the introduction of "best practice"/"state of the art" etc into the offshore drilling and production industry. This discussion is variously applied to best practice in regulatory systems, best practise in technical standards, and best practise in systems of working/operation. This is an issue that is linked to standards, but is somewhat different, and the discussion can cause confusion in industry and government. We in IRF need to be very clear what we mean, and what our role is in promoting and, possibly, ensuring adoption of best practise.

The automatic adoption across the offshore industry of the highest and most sophisticated safety and environmental control measures ("best practice") is not necessarily the legal requirement in most countries – most regulatory regimes do not specify absolute safety within their legislation. A more helpful concept is therefore "good practice" (the concept of "good oilfield practise" has some historical acceptance):

"good practice is the generic term for those standards for controlling risk which have been judged and recognized (by the regulator?) as satisfying the law when applied to a particular relevant circumstance in an appropriate manner"

The presumption is that good practice is written down or defined in some form, with its scope/detail reflecting the nature of the hazards and risks, the complexity of the activity or process, issues of technical feasibility and the nature of the relevant legal requirements. It also gives tacit acceptance of any residual risks that will remain.
Sources of recognised good practice include:

- specific detailed requirements contained in primary legislation or regulations
- guidance and codes written or formally approved by the relevant regulator
- standards produced by authoritative standards-developing organizations (e.g. ISO, CEN, API);
- guidance written by industry representative bodies (e.g. global/ regional/national trade associations such as OGP, IADC, OOC, etc)

other, unwritten, sources of good practice that may be recognized if they are established standard practice that is widely adopted throughout the industry.

NB. In this respect it is important to also consider the state of the art (see definition on page 14).

'Good practice' can be distinguished from the term 'best practice' that usually means a standard of risk control above the legal minimum. Whilst regulators should encourage industry's continuous improvement, just because one operator is performing to a significantly tougher standard than the existing norm does not mean that regulators can enforce that higher standard on others. Some operators may implement standards of risk control that are more stringent than good practice for a number of reasons such as meeting corporate responsibility goals, or because they strive to be the best at all they do, but it does not automatically follow that everyone else must adopt them. However, this is not a static situation – "best practice" can become "good practice" over time as a result of, for example, technological innovation becoming more widely adopted, costs of new approaches change or because of changes in accepted management practices. Good practice may also change because of increased knowledge about the hazard and/or a change in the acceptability of the level of risk control achieved by the existing good practice – the current position post-Macondo is going to be a time when such changes are inevitable, and possibly more rapid than normal. The IRF members should encourage / influence continuous improvement such that "best practice" becomes recognized as "good practice" as quickly as possible.

Proposal 5: the role of IRF on issues of good practice and of best practice needs to be distinguished. IRF should influence good practice via the standards route, and sections 1-3 above discuss that further. In relation to best practice, though, the role of IRF has to be different, and should include:

- general influencing and challenging industry to continuously innovate, via existing IRF projects and liaison with OGP, IADC etc
- facilitating cross-industry learning so that existing examples of "best practice" can be made known and hence encourage greater adoption of such practice so that they then become industry "good practice". The 2010 IRF Conference and the 2011 IRF summit are examples of this.
- individual IRF members sharing examples of best practice with other IRF members, for further national or regional cascade

5. References

1. ISO/TC 67 Management Committee *Action Plan for drilling, well construction, and well operations standards, resulting from the Montara and Macondo accidents*, ISO/TC 67 doc. N1119, March 1st 2011.
2. OGP: Regulators 'use of standards' (Report no. 426, March 2010);

Annexes

Annex 1 Contribution from ISO/TC67, by Neil Reeve (Chair) and Harold Pauwels (Secretary)
Annex 2 Contribution from OGP, by Ross Smith (Chair) and AlfReidar Johansen (Manager) of OGP Standards Committee

Annex 1

Contribution from ISO/TC67
By Neil Reeve (Chair) and Harold Pauwels (Secretary) of ISO/TC67

Mission, vision and scope of ISO/TC 67

ISO Technical Committee 67 (ISO/TC 67) is the technical committee in the International Organization for Standardization (ISO) responsible for standards for equipment for the petroleum and gas industries. There are two other ISO technical committees specifically relating to the oil and natural gas industries. These are ISO/TC 28 *Petroleum products and lubricants* and ISO/TC 193 *Natural gas*. However these two committees relate to the specifications and associated test methods for the products these industries sell, rather than the equipment required to produce these products.

The title of ISO/TC 67 is: *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries.*

Its formal scope is: *Standardization of the materials, equipment and offshore structures used in the drilling, production, transport by pipelines and processing of liquid and gaseous hydrocarbon within the petroleum, petrochemical and natural gas industries. Excluded: aspects of offshore structures subject to IMO requirements (ISO/TC8).*

The mission, vision and goals of ISO/TC 67 are:

Mission: To create value-added standards for the oil and natural gas industry.

Vision: Global standards used locally worldwide.

Goals:

- Prepare standards required by this industry;
- Prepare standards that are adopted worldwide by bodies such as ABNT (Brazil), API (USA), CEN (Europe), GOST R (Russian Federation), GSO (Gulf Region) and SAC (China);
- Prepare standards that are recognized by regulators;
- Publish standards that enable companies to minimize their specifications;
- Deliver standards to the target dates on the agreed work programme.

Full information on ISO/TC 67 is available at the ISO website **http://www.iso.org**under technical committee 67.This website specifically provides the membership, organizational structure, work programme status (details and summary), and list of published documents.

Organization

ISO/TC 67 has divided its work programme under six subcommittees (SCs) and some 50 working groups reporting to the TC or SCs. ISO works with a national model, and the leadership of the TC, SC and WGs are provided from representatives of a wide range of countries. These are arranged through the national standards body of the country members of ISO. Countries providing leadership in ISO/TC 67 TC, SCs and WGs are: Brazil, Canada, China, France, Germany, Italy, Japan, Netherlands, Norway, Russian Federation, Spain, Qatar, UK and USA. The full membership of ISO/TC 67 is some 60 countries, of which 30 are so-called observer members (with lower voting and participation rights and obligations). The membership continues to grow year on year. In this way, the large majority of countries with an interest in the oil and gas industry are actively involved.

ISO/TC 67 was re-established in 1989 with ANSI/API holding the Secretariat till 2009, when the Netherlands was allocated this role. Its initial work program was based on approximately 70 API standards, with the intent that these should be used to initiate the development of a coherent framework of International Standards for the industry. As of July 2011 the committee has a portfolio of 151 published ISO standards, over half of these are in their second or third revision; some 70 standards are in currently in development (either as new documents or revisions); some 35 documents are on the work programme being prepared for their first edition. Typically some 20 documents are published (new or revisions) each year. i.e. the committee is active. The average time to develop a standard is some 3.5 years. However this can be done (if particular urgency requires) in as few as 18 months. The main reason for the duration is the time required to gain international consensus on the technical content of the document.
Reporting to the TC is a Management Committee (MC) comprised of one representative from those countries wishing to be actively involved in the strategic issues of the committee. Currently there are 15 members. The MC meets face-to-face twice per year, and holds monthly telephone conferences calls.

The SCs hold at least one plenary meeting each year. The TC holds one plenary meeting each year. This was in Doha, Qatar in 2010, and will held be in Moscow on 14, 15 September 2011.

It is hard to identify the exact number of experts involved in the work of ISO/TC 67. Some 1000 are currently formally registered in the ISO database, however if one includes the numbers who are involved in commenting on the documents at a national level it is conservatively estimated that over 3000 people are involved to a greater or lesser extent. Virtually all are part-time volunteers representing their stakeholder organization. A rough analysis shows that participation in the technical work comes approximately: 40% from users, mostly the oil companies; 40% from manufacturers/suppliers including service suppliers; and 20% from academia, regulators, certification/classification bodies, trade unions etc.

Status of standards developed by ISO/TC67

1. ISO/TC 67 continues to react to the needs of the international oil and natural gas industry, through its vision “Global standards used locally worldwide”. This means developing standards that can be used with as few changes as possible everywhere in the world, and that such standards are used. The committee, often together with OGP, reaches out to facilitate participation in the development of the standards, and in encouraging their use. New content originates from many sources, but notably industry and company standards, for example API, CEN, NORSOK and OGP member company specifications. Recently, new work items have been added originating from oil companies in Brazil, China, Qatar and Russia.
2. Examples of globally relevant new fields of standardization over the recent past include: arctic engineering (the first arctic offshore structures document ISO 19906:2010 was published in 2010. This was a totally new document developed in ISO/TC 67); LNG equipment (the first ISO/TC 67 document for LNG, *ship to shore interface,* ISO 28460:2010, was published in 2010. This was originally based on a CEN European standard); and CCS and CO2 (a work programme for relevant equipment standards is just starting under the leadership of Brazil and Canada).
3. Over half of the standards developed by ISO/TC 67 have been based on the content of API standards (as a starting point). Drafts developed this way always receive the input and comments from outside API that then enrich the global relevance of the standards.
4. The vast majority of the standards developed by SDO’s are equipment/material standards. This is because the original focus was on these documents, and it was deemed that they are simpler to agree. The number of operating/process standards is fairly limited, however the demand for these, which tend to be more difficult to write, is growing.
5. There are excellent standards both technical and operational, amongst the so called “other standards” that could be upgraded to (preferably) International Standards. These are in the future standards pipeline.
6. The national adoption of the ISO/TC67 standards is accelerating. For example: In the last three years (to July 2011) the Russian Federation have adopted 30 of the 151 published

ISO/TC67 standards as GOST national standards. The Gulf Standards Organization (a region comprising the countries Saudi Arabia, Bahrain, Qatar, UAE, Oman, Kuwait, and Yemen) have adopted 77 as national standards in each country. Over the last 4 years China has adopted 55 and Kazakhstan 89. Over the last ten years CEN (as national standards in all 30 member countries in Europe) and API have respectively adopted 133 and 80. The majority of these adoptions are as “identical”, however there are some which are “modified” nationally for various reasons. Ref 1.

7. Typically, English language version identical adoptions are simple pdfs of the original ISO version with a cover sheet(s) of the issuing SDO. Language translations are typically authorized by the relevant language national standards body.
8. Where it has not been possible to obtain total agreement on certain standards a national or regional annex can be added. The idea of supplementing a “core” agreed to standard with an annex will continue as a mechanism to address certain domestic needs.The development of "country" or "regional" annexes to international standards is an approach which can accommodate needs and/or conditions specific to individual countries or regions. Most commonly these annexes are published in the “modified” national adoption (for example to accommodate the requirements of the API monogram program in some API adoptions). Sometimes these can be in the ISO documents, and an example of this is the draft revision to ISO 3183, *linepipe,* where an annex to accommodate particular requirements for the European Gas Supply industry is being included.
9. A standard does not in itself impose any obligation upon anyone to follow it. However, such an obligation may be imposed, for example, by legislation/regulation (Ref 6) or by a contract. In order to be able to claim compliance with a document, the user needs to be able to identify the requirements he/she is obliged to satisfy. The user also needs to be able to distinguish these requirements from other provisions where there is a certain freedom of choice. Clear rules for the use of verbal forms (including modal auxiliaries) are therefore essential. In ISO, CEN, API etc. the use of the words “shall”, “should”, “can”, “may” and “must” etc are clearly defined (see also below). Ref 2 and 3.
10. Through the work of OGP, and direct input to its MC, ISO/TC 67 notes that Regulators around the world are increasingly recognizing the standards developed by ISO/TC 67. See Ref 4. Corresponding increased participation from the Regulators would be welcomed in the work of the committee.

ISO/TC 67 response to Macondo and Montara

Following the Montara and Macondo accidents ISO/TC 67 developed an Action Plan for drilling, well construction, and well operations standards (Ref 5). The Action Plan of standards development activities addresses the lessons learned from these accidents in so far as they relate to international standards. A total of 33 standards actions have been identified, of which 13 are deemed high priority. In addition a list is provided of 71 standards/documents from ISO and other organizations, particularly API, relevant to the two accidents that are available for use now.

To carry out the actions 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, such as for well cements, foam slurries, isolation of flow zones during well construction, and BOP equipment. Other proposed subjects are new: for example the "Wells integrity - umbrella document"; the "Development and implementation of HSE management systems" and "competence of personnel". These require new resources from the interested stakeholder groups. The ISO/TC 67/MC has assigned 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 actions identified in this Action Plan are implemented in the international standards portfolio.

This work 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 Action Plan has also demonstrated the value of direct communication between the multidimensional stakeholders. Input has been seen from API; the International Regulators Forum (IRF); CEN; the North Sea Offshore Authorities Forum (NSOAF); OGP's Standards Committee and Global Industry Resource Group; ISO Subcommittee Chairs and Work Group conveners; equipment manufacturers; etc. 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.

Definitions (from Ref 2)

It is important that in discussions on this subject people involved do know the precise definitions of some of the most frequently used words.

Authority: body that has legal powers and rights.

Regulatory authority: authority that is responsible for preparing or adopting regulations

Enforcement authority: authority that is responsible for enforcing regulations.
Note: The enforcement authority may or may not be the regulatory authority.

Standardisation: activity of establishing with regard to actual or potential problems, provisions for common and repeated used, aimed at the achievement of the optimum degree of order in a given context.
Note 1: In particular, the activity consists of the processes of formulating, issuing and implementing standards.
Note 2: Important benefits of standardisation are improvement of the suitability of products, processes and services for their intended purposes, prevention of barriers to trade and facilitation of technological cooperation.

International standardisation: standardisation in which involvement is open to relevant bodies from **all** countries.

Regional standardisation standardisation in which involvement is open to relevant bodies from countries from only one geographical, political or economic area of the world.

National standardisation: standardisation that takes place at the level of one specific country.

Standard: document established by consensus and approved by a recognised body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.
Note: Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits.
(Note in this context recognized body means a recognized standards organization).

Consensus: general agreement, characterised by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned *(i.e. manufacturers, suppliers, including service suppliers, users including the oil companies, academia, regulators, certification bodies, trade unions etc*) and to reconcile any conflicting arguments.
Note: consensus need not imply unanimity.

International standard: standard that is adopted by an international standardising / standards organisation and made available to the public.

Regional standard: standard that is adopted by a regional standardising / standards organisation and made available to the public.

National standard: standard that is adopted by a national standards body and made available to the public.

Code of practice: document that recommends practices or procedures for the design, manufacture, installation, maintenance or utilization of equipment, structures or products
Note: A code of practice may be a **standard**, a part of a standard or independent of a standard.

Other standards
Note: Standards may also be adopted on other bases e.g. branch standards and company standards. Such standards may have a geographical impact covering several countries.

State of the art: developed stage of technical capability at a given time as regards products, processes and services, based on the relevant consolidated findings of science, technology and experience.

Verbal forms (from Ref 3)
The word *shall* indicates a requirement.
The word *should* indicates a recommendation.
The word *may* indicates a permission.
The word *can* indicates a possibility.
In ISO/IEC the use of the word “must” is deprecated.

References

1. OGP: Global standards used locally worldwide (Report No.4210, September 2010);

2. ISO/IEC Guide 2:2004, Standardization and related activities - General vocabulary
3. ISO/IEC Directives Part 2:2011, *Rules for the structure and drafting of International Standards, Annex H, Verbal forms for the expression of provisions*
4. OGP: Regulators ‘use of standards’ (Report No. 426, March 2010);
5. ISO/TC 67 Management Committee *Action Plan for drilling, well construction, and well operations standards, resulting from the Montara and Macondo accidents*, ISO/TC 67 doc. N1119, March 1st 2011.
6. ISO: “Using and referencing ISO and IEC standards for technical regulations:2007”;

Annex 2

Contribution from OGP

By Ross Smith (Chair) and AlfReidar Johansen (Manager) of OGP Standards Committee

Value of standards

Standards are the tools we use to organize our technical world. They underpin expectations that the platforms, systems and equipment will be safe, reliable and fit-for-purpose.

International standards are particularly important for the oil and gas industry; simplifying global procurement and assuring quality. Such standards, which have become integral components of our economic, social and legal systems, are often taken for granted; their crucial role in modern society often unrecognized.

Yet standards do not come into this world ready-made for use. Someone has to create them. For the oil & gas industry that responsibility often falls to OGP's active membership. Ref 1: OGP Report 440, June 2011.

OGP's position on use of standards

The petroleum and natural gas industries use a great number of standards developed by industry organisations, through national and regional standardisation bodies, by the individual companies in the industries and by international standards bodies.

The use of these standards enhances technical integrity, improves safety, reduces environmental impact, and promotes business efficiencies that result in reduced costs. The current, intensified period of international standards development reflects the global nature of the industry and the imperative to operate more effectively and reduce costs further. International standards for the petroleum and natural gas industries are the area that is the focus of OGP through its Standards, Offshore Structures and other OGP committees.

OGP's position on the development and use of international standards is set out in Ref 2 Report No. 381, March 2010. In this document, OGP strongly supports the internationalization of key standards used by the oil & gas industry, building on work started in conjunction with the International Organization for Standardization (ISO) in 1989. OGP recognize that other standards development organizations publish standards used globally.

Global standards used locally worldwide

The vision of the petroleum, petrochemical and natural gas industries standards effort in ISO Technical Committee 67 is *global standards used locally worldwide*. Ref 3 OGP Report No. 4210 reflects where we are in this vision, i.e. which countries have adopted the ISO/TC67 standards.

Regulators use of standards

Regulations for the oil and gas industry are normally set by national regulators, with a few international exceptions such as ILO and IMO. This inadvertently leads to differences in regulations across the globe as they are written by different people of different background and culture, with potential for small or large differences in the technology to be applied. Most of the regulators use standards in defining their schemes, regulations, guidelines or other regulatory documents.

OGP carried out a survey amongst fourteen 'regulators' on their use of standards that were published by any of the many standards developing organisations around the globe. Ref 4 OGP Report 426, March 2010.

The main findings can be summarized as follows:

1) This report shows that regulators make good use of standards. 1,348 references to standards in total have been identified, whereas 1,140 of these references are to different, individual standard titles. In these numbers Russia has not been included and China has no specific references.

2) Of these 1,140 different standards, as many as 989 or 87% are referenced by one regulator only. This shows a wide spread in regulators references. This leaves only 13% of the standards to be referenced by two or more regulators.

3) These standards emanate from more than 60 different international, regional, national and industry standards development organisations around the globe.

4) There is a dominance of references to industry standards (44%), then to national standards (35%) and finally international standards third (21%) on a global basis. Compared with an earlier European analysis performed in 1996, there is a significant increase in the reference to international standards and a sharp decrease in references to national standards. Considering the European regulators only, the new analysis compared 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.

5) The regional source of the referenced standards is 40% from SDOs in America, 24% from Europe, 21% are international standards and 15% emanates from SDOs in India, Australia and New Zealand.

6) API standards are dominating, with 225 references, including 49 API Manual of Petroleum Measurement (MPMS) standards.

7) ISO has delivered 152 of the standards referenced by the regulators covered by this report and59 of these come from the work of ISO/TC 67.

8) There is a set of standards referenced by regulators that cover same subject and thus duplicate each other. Examples of these are in the subject areas of offshore structures and pipelines.

9) Nearly all of the regulators examined make specific references to standards in their documents, with large variations in numbers referenced, from 5 to 393 references. However, there are many general references to standards in regulatory documents so all regulators examined expect standards to be used.

10) Most of the references are to undated revisions of standards, whereas some regulators, e.g. PSA, US MMS and USCG make reference to dated revision only.

11) 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.

The main conclusions based on these findings can be summarised as follows:

1) 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.

2) 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.

3) Duplication of standards should be looked into for harmonization, with the objective of reducing the number of standards covering the same subject.

4) The oil and gas industry is able to directly influence the content of 380 of the standards listed in this report and therefore is largely responsible for their development and maintenance.

5) Whilst the references to international standards by the regulators on a global basis have increased to 21%, there is still more international standardisation effort to be done.

Global Industry Response Group (GIRG) recommendation

In response to accidents such as Macondo and Montara, the OGP Management Committee set up a GIRG with leadership from the international oil & gas industry. They worked together to develop recommendations for improving well incident prevention, intervention and response capability. The output from this work is now available.

- Summary (Ref 5)
- Deepwater wells (Ref 6)
- Capping & containment(Ref 7) (also www.SubSeaWellResponse.com)
- Oil spill response (Ref 8)

The GIRG reports integrate with the specific Macondo and Montara investigations and reports separately undertaken in individual jurisdictions, such as the United States, United Kingdom and Australia.

The development of these global recommendations was a large and complex year-long undertaking that required significant industry investment in terms of both human and financial resources. The membership of the International Association of Oil & Gas Producers (OGP) pooled its knowledge and experience to create three dedicated teams drawn from some 20 companies and comprising more than 100 technical experts and senior managers. Each team looked at a different key element of well incident management – prevention, intervention and response – with a view to collectively developing an overarching package of recommendations to reduce the likelihood and impact of well incidents.

Many of the recommendations outlined in these reports are already underway (such as the establishment of the consortium on capping response) and others are continuations of work already in progress. However, all of them create a lasting legacy for the industry; one that requires an enduring financial and cultural investment. This report and the recommendations it contains are not a one-off exercise but a constant requirement and commitment to review and invest in industry safety. Improving safety is necessarily a continuous task and there will always be new developments, improvements and enhancements to be made. These proposals – if adopted and implemented as a whole – represent an important step forward in that ongoing endeavor.

Whilst the technical content of each set of recommendations is necessarily varied and highly specialized, they have one very important principle in common: prevention is paramount. Action on prevention will yield both the most effective outcomes and represent the most efficient use of resources. These recommendations, and their implementation and promotion by OGP and its member companies, will not only advance significantly well incident prevention, but also greatly improve intervention and response capability.

References

1. OGP: Value of standards (Report No. 440, June 2011)
2. OGP: Position paper on the development and use of international standards (Report No. 381, March 2010)
3. OGP: Global standards used locally worldwide (Report No.4210, August 2011)
4. OGP: Regulators' use of standards (Report No. 426, March 2010)
5. OGP: GIRG Summary report (May 2011)
6. OGP: Deepwater Wells (Report No. 436, May 2011)
7. OGP: Capping & containment(Report No. 464, May 2011)
8. OGP: Oil spill response(Report No. 465, May 2011)