National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

CONTINUOUS IMPROVEMENT IS ESSENTIAL: LEVERAGING GLOBAL DATA AND CONSISTENT STANDARDS FOR SAFE OFFSHORE OPERATIONS

Staff Working Paper No. 18

Staff Working Papers are written by the staff of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling for the use of members of the Commission. They do not necessarily reflect the views of the Commission or any of its members. In addition, they may be based in part on confidential interviews with government and non-government personnel.

"To get where we need to be on safety, continuous improvement is essential. In an industry such as ours, which operates 24 hours a day around the world, the need to manage risk never ends. Even the best safety framework should be viewed as a work in progress." Rex Tillerson, CEO ExxonMobil[1]

Introduction

The participants at the 3rd International Regulators' Offshore Safety Conference concluded: "Wherever possible, the best standards should be identified and applied internationally."

They met over 18-20 October, 2010 in Vancouver, British Columbia, Canada after two of the worst offshore blowouts and spills in history on opposite sides of the globe and agreed that the need for international cooperation and collaboration could not have been clearer. They noted: "Regulators should serve as catalysts for learning by distributing information, hosting workshops, participating in research, and identifying gaps in standards and best practices…Sustaining outstanding performance is critical to the reputation of industry and government."[2]

Despite variations in regulatory regimes, geological settings, and marine environments, oil and gas drilling operations have a lot in common, and these commonalities allow for uniform data collection. Such data can then be used as the basis for international

[1] Testimony of Rex Tillerson, ExxonMobil, Hearing before the National Commission, November 9, 2010, 256.
[2] "Conference Summary," International Regulators' Forum, http://www.irfconference2010.com/showcontent.aspx?MenuID=940.

standards that would provide oil and gas regulators a common language in which to discuss and assess ways to manage the challenges presented by work offshore.

Today there are many different standard-setting bodies involved in the creation of technical standards. The resulting variations in standards creates a high regulatory "transaction cost" for companies working under multiple regulatory jurisdictions. These transaction costs could be lowered by more globally unified standards.

Creating well-informed standards with regard to best practice and safety requires comprehensive, objective, high-quality data in order to highlight trends and areas in need of specific attention. While the economic benefits of equipment standards and bare minimum requirements are often clear, the value of improved safety and risk management can be hard to quantify.

This paper identifies the various organizations that collect incident and personal injury data for offshore oil and gas operations, what data each collects, and how that data might be used. This paper also considers the various national and international standard-setting organizations related to offshore oil and gas activities and their governing guidelines.

Offshore Oil and Gas Incident and Injury Databases

Collecting High-quality, Objective, Comprehensive Data. Complete and accurate industry incident data are critical to informing industry and regulators about the safety of offshore operations, identifying areas that need work, and guiding both industry and regulators toward improvements. In countries where competent regulatory systems exist, the regulators can impose a high degree of compliance in developing quality statistical information. Industry organizations also collect such data from their members but rely on voluntary compliance. Yet, while voluntary, these industry sources provide the only information in areas of the world where the regulatory regimes either do not exist or are not engaged in proactive oversight of offshore activity. Comprehensive data reflecting the common experience of this global industry is lacking because national regulators and these other organizations collect offshore data in a nonuniform fashion. As a result, data from different jurisdictions is not relatively comparable, undermining meaningful efforts to compare how differing regulatory regimes and safety standards work in application.

For that this reason, there is a compelling for national regulators with the cooperation of the industry organizations to establish uniform standards for comprehensive and objective data collection in order to promote improvements in safety globally.

Incident Data-Collecting Organizations. There are a number of organizations that strive to maintain databases reflecting offshore oil and gas activity and practice, for both occupational and process safety, covering such things as fires, explosions, structural

failures, release of hydrocarbons, near-misses, minor and major injuries to personnel, and fatalities.

Offshore Regulators

The International Regulators' Forum (IRF), a group of offshore health and safety regulators for the oil and gas industry, was formed to promote information sharing and collaboration through joint programs. Through its Performance Measurement Project,[3] the IRF collects incident data from its member countries to measure and compare offshore safety performance on a common set of criteria.[4]

The Performance Measurement Project includes annual data related to number of fatalities, injuries, collisions, fires, and losses of well control. The program uses hours worked, production, number of offshore installations, and the number of well-related activities as bases for comparison. IRF data include helicopter-related incidents only if they are "at or near" an offshore installation. Detailed information is compiled based on data reported by companies to each government regulator. IRF compiles the information based on criteria (scope, definitions, and data collation guidelines) developed jointly by IRF members.[5] There is a comparable data set across the group of countries for the years 2006 through 2009.

INTERNATIONAL REGULATORS FORUM GLOBAL OFFSHORE SAFETY	
Member Country Profiles[6]	**Reporting Authority**
Australia	National Offshore Petroleum Safety Authority
Brazil	National Agency of Oil, Gas and Biofuels (ANP)
Canada	Canada-Newfoundland and Labrador Offshore Petroleum Board & Canada-Nova Scotia Offshore Petroleum Board
Netherlands	State Supervision of Mines
New Zealand	Department of Labour

[3] "IRF Performance Measurement Project," International Regulators' Forum, http://www.irfoffshoresafety.com/country/performance/scope.aspx.
[4] Ibid.
[5] "IRF Country Performance Measures," International Regulators' Forum, http://www.irfoffshoresafety.com/country/performance/.
[6] "Member Country Profiles," International Regulators' Forum, http://www.irfoffshoresafety.com/country/.

Norway	The Petroleum Safety Authority
United Kingdom	Health and Safety Executive
United States	Bureau of Ocean Energy Management, Regulation and Enforcement

The data are published annually in an online database, accessible as data downloads to allow for easy third-party data analysis.

Industry Associations

The International Association of Drilling Contractors (IADC)[7] is an industry organization of the oil-and-gas and geothermal drilling and completion industry worldwide.[8] Through its Incident Statistics Program, it collects and tracks safety and accident information for the drilling industry in order "to record data reflecting accident experience which can be compared to other industries, to identify causes and trends of drilling industry injuries…"[9]

Detailed information is collected from drilling contractors voluntarily participating in the IADC program.[10] Thus the data is a subset of all oil and gas operations. The program collects monthly data related to number of fatalities, number of injuries, and total hours worked for both onshore and offshore operations. Participating companies file detailed information about each reported incident. In order to ensure the integrity of its data and analysis, IADC periodically refines its definitions, categories, and reporting guidelines. The data include helicopter-related incidents only if they are at or near an offshore installation.

IADC data are published in quarterly summary reports and an annual report known as the *Summary of Occupational Incidents*.[11] In this annual online report, data are compared across geographic regions by calculating rates of fatalities and injuries; incidents are further analyzed through charts and tables that delineate various categories and causes. Each annual online report is accessible as data downloads to allow for easy analysis by interested third parties. Given that categories and reporting guidelines change, it can be difficult to compare trends over time.

The International Association of Oil & Gas Producers (OGP)[12] is an industry organization of the world's oil and gas exploration and production (E&P) companies. Through its

[7] "International Association of Drilling Contractors," http://www.iadc.org/.
[8] "About IADC," International Association of Drilling Contractors, http://www.iadc.org/iadc.htm.
[9] "IADC Incident Statistics Program (ISP) – Introduction," International Association of Drilling Contractors, http://www.iadc.org/asp.htm.
[10] Ibid.
[11] International Association of Drilling Contractors, *IADC Incident Statistics Program 2010: Reporting Guidelines* (January 19, 2010).
[12] "International Association of Oil & Gas Producers," http://www.ogp.org.uk/.

Safety Performance Indicators report, OGP tracks safety incident data for the E&P industry.

Detailed information is collected from OGP's 43 member companies and their contractor employees.[13] Thus the data is a subset of all offshore oil and gas operations. The program collects annual data related to the number of fatalities, number of injuries, and total hours worked for onshore and offshore operations. Additionally, companies must report information about each incident, indicating the cause of the incident and the activity being performed when the incident occurred. Like IADC, the OGP periodically refines its definitions, categories, and reporting guidelines. OGP data include offshore helicopter-related incidents.

OGP data are published in an annual report, which provides "trend analysis, benchmarking and the identification of areas and activities on which efforts should be focused to bring about the greatest improvements in performance."[14] In this report, data are presented and analyzed by geographic region, function, and company by calculating rates of fatalities and injuries, and incidents are analyzed further by various categories and causes. The data are presented in tables in each annual report, but are not accessible through direct download.

Other Sources of Offshore Data

Det Norske Veritas(DNV) is an "independent foundation with the purpose of safeguarding life, property, and the environment."[15] DNV has "collected accident data and provided the offshore industry with statistical material since 1975."[16] Through its Worldwide Offshore Accident Databank (WOAD), DNV tracks safety and accident history to be a source of data "available for offshore risk assessments and emergency planning."[17] Through its Leak Program, DNV tracks incidents in the UK HSE Hydrocarbon release database in order to allow companies "to calculate leak frequency in process equipment and manage [the] risk."[18]

The WOAD database is compiled from information available from authorities, official publications and reports, newspapers, databases, rig owners, and operators globally.[19] WOAD consists of data for over 6,000 accidents and incidents from 1970 forward.[20] The data include details such as "name, type and operations mode of the unit involved in the accident, date, geographical location, chain of events, causes and consequences, and

[13] OGP, *Safety Performance Indicators – 2009* (International Association of Oil & Gas Producers, May 2010), iv-v.
[14] Ibid., iv.
[15] "Safeguarding Life, Property and the Environment," Det Norske Veritas, 2010, http://www.dnv.com/moreondnv/profile/about_us/.
[16] "Woad – Offshore Accident Databank," Det Norske Veritas, 2010, http://www.dnv.com/services/software/products/safeti/safetiqra/woad.asp.
[17] Ibid.
[18] "Leak – Calculate Leak Frequency," Det Norske Veritas, 2010, http://www.dnv.com/services/software/products/safeti/safetiqra/leak.asp.
[19] "Woad – Offshore Accident Databank," Det Norske Veritas.
[20] Ibid.

evacuation details."[21] WOAD also contains technical information about "approximately 3,700 offshore units including mobile drilling units' locations and operation modes at any time."[22] Both databases are available for purchase.

The SINTEF Group is an independent research organization based in Norway.[23] Its Offshore Blowout Database "is a comprehensive event database for blowout risk assessment. The database includes information on 573 offshore blowouts/well releases that have occurred world-wide since 1955. The blowouts/well releases are categorized in several parameters, emphasizing blowout causes. A user-friendly interface allows for customized search patterns."

The descriptions contain "51 different fields describing each blowout/well release," which are organized into six groups: "category and location, well description, present operation, blowout causes, blowout characteristics, [and] other."[24] The database and annual report are confidential and accessible only by the project sponsors.[25]

From Gathering Data to Setting Standards

Standards are a core component of safety programs for any industry, particularly those dependent upon complex processes and technology. Developing international standards for incident reporting in the offshore environment is crucial to developing a consistent, high-quality, global data set to inform the need for other new and/or improved risk management and safety standards.

The offshore oil and gas industry operates internationally with rigs, barges, support vessels, and personnel moving from one region to another. Components of a deepwater production facility, whether it is being built for Brazil, West Africa, or the Gulf of Mexico, are made throughout the world. The consistent application of standards can promote safety and prevent pollution, enhance operational efficiency and facilitate international commerce. Developing collective, international offshore standards, rather than relying on an array of different national standards, would promote efficiency and facilitate information sharing to ensure best practices are embodied in standards.

Who participates in the standardization process? The primary groups that govern the standardization process for oil and gas activity inside and outside the United States are the International Organization for Standardization (ISO), the American National

[21] Ibid.
[22] Ibid.
[23] "About SINTEF," SINTEF, January 7, 2011, http://www.sintef.no/Home/About-us/.
[24] "SINTEF Offshore Blowout Database," SINTEF, April 16, 2010, http://www.sintef.no/Home/Technology-and-Society/Safety-Research/Projects/SINTEF-Offshore-Blowout-Database/.
[25] The project sponsors are Statoil, Total E&P Norge, Shell Research Limited, BP Norge, Safetec A/S, Scandpower Risk Management, DnV, Lilleaker Consulting a.s., Eni Norge AS, ConocoPhillips Norge, and BHP Billiton.

Standards Institute (ANSI), and the American Petroleum Institute (API).[26] ANSI is the U.S. Member Body and dues-paying organization of the ISO."[27]

The ISO, the world's largest developer and publisher of international standards, is a network of the national standards institutes of 163 countries, one member per country, with a secretariat in Geneva, Switzerland that coordinates activities.

ANSI is the official U.S. representative to ISO, but delegates most responsibilities for oil and gas standards to API. As the U.S. member of ISO, ANSI is responsible for participation in those technical areas of work where U.S. interests have indicated support. ANSI normally looks to the body that develops national standards in a particular area or industry to determine U.S. positions in similar international standardization activities. ANSI adds an additional level of transparency to the process by providing notifications of U.S. standards development activities, including national adoptions of international standards, through the ANSI "Standards Action" newsletter.

In the case of oil and gas activities ANSI looks to API. Thus this portion of the paper focuses on API's standardization process, as approved by ANSI and ISO. "Part of ANSI's responsibilities as the U.S. member body to the ISO includes accrediting U.S. Technical Advisory Groups (U.S. TAGs). The primary purpose of these groups is to develop and transmit, via ANSI, U.S. positions on activities and ballots of the Technical Committees (and as appropriate, subcommittees and policy committees). These technical issues include the approval, reaffirmation, revision and withdrawal of ISO standards."[28] In accordance with ANSI accreditation procedures, API is required to respond to all public comments and objections resulting from this public notification.

ISO Technical Committee (TC) 67, "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" is responsible for the materials, equipment, and offshore structures used in drilling, production, pipeline operations, and oil and gas processing, and is the most important committee from the standpoint of offshore oil and gas operations. API serves as the secretariat of TC 67's Subcommittee 4, "Drilling and Production Equipment" on behalf of ANSI. "All U.S. TAGs to ISO must adhere to the procedural requirements contained in the *ANSI Procedures for U.S. Participation in the International Standards Activities of ISO*."[29] Additionally, API must also follow the guidelines outlined in *ANSI Essential Requirements: Due process requirements for American National Standards*, which outlines "the minimum acceptable due process requirements for development of consensus… The standards development process shall not be dominated by any single interest category, individual, or organization… The standards process should have a balance of interests." However,

[26] API is also a lobbying organization.
[27] "ANSI Accredited U.S. Technical Advisory Groups (TAGs) to ISO," American National Standards Institute, http://www.ansi.org/standards_activities/iso_programs/tag_iso.aspx?menuid=3.
[28] "ANSI Accredited U.S. Technical Advisory Groups (TAGs) to ISO," American National Standards Institute.
[29] Ibid.; ANSI, ANSI Procedures for U.S. Participation in the International Standards Activities of ISO (January 2010).

"no test for dominance is required… Appropriate, representative user views shall be actively sought and fully considered in standards activities."

When the ISO committee responsible for petroleum and natural gas was reactivated in 1989 (ISO TC 67) API offered up a suite of API standards to be used as the basis for ISO standards. That coordination continues, with about 70 percent of all the published TC 67 standards being based on API standards.[30]

Phases of Standards Development

The process for developing oil and gas standards generally consists of three main phases: establishing the need for a standard, negotiating the specifics of the standard, and approving the standard. According to ISO, "[i]nternational standardization is market-driven and therefore based on voluntary involvement of all interests in a given marketplace."[31] ISO describes the standards development process as follows:

> The need for a standard is usually expressed by an industry sector, which communicates this need to a national member body. The latter proposes the new work item to ISO as a whole. Once the need for an International Standard has been recognized and formally agreed, the first phase involves definition of the technical scope of the future standard. This phase is usually carried out in working groups which comprise technical experts from countries interested in the subject matter.[32]
>
> Once agreement has been reached on which technical aspects are to be covered in the standard, a second phase is entered during which countries negotiate the detailed specifications within the standard. This is the consensus-building phase.[33]
>
> In the ISO process, "The final phase comprises the formal approval of the resulting draft International Standard (the acceptance criteria stipulate approval by two-thirds of the ISO members that have participated actively in the standards development process, and approval by 75% of all members that vote), following which the agreed text is published as an ISO International Standard.[34]

API follows a slightly different method:

> API [also] develops industry standards on the basis of consensus. Consensus is established when substantial agreement has been reached. Substantial agreement means more than a simple majority but not necessarily unanimity.

[30] David Miller, Director, Standards, API, e-mail message to Commission staff, February 16, 2011.
[31] "How are ISO Standards Developed?," International Organization for Standardization, 2011, http://www.iso.org/iso/standards_development/processes_and_procedures/how_are_standards_developed.htm.
[32] Ibid.
[33] Ibid.
[34] Ibid.

> Consensus is defined as approval by a majority of those eligible to vote and at least two-thirds of those voting, excluding abstentions.[35] API's procedures are approved by ANSI for compliance with its "Essential Requirements" of openness, balance, consensus and due process. ANSI conducts regular audits of the API standards program to ensure ongoing compliance.

API (as well as ISO) requires proper notification of standards activities "in order to provide an opportunity for participation by all directly and materially affected persons. Such announcements may be in the form of notices or copies of committee notices, to known interested parties or announcements in suitable media, including electronic, appropriate for the known affected interests."[36] Public notifications must be issued for: meetings of standards committees; intent to develop, revise, reissue, or withdraw standards; availability of drafts of standards; and letter ballot approval of new, revised, or reissued standards or approval of withdrawal of standards. API also submits "a list of planned standards activities each year (both new standards under development and existing standards under revision) to the National Institute of Standards and Technology (NIST) for publication in the Federal Register."[37] API is one of only two U.S. standards development organizations that regularly publish their annual standards plan in the Federal Register.

Adoption

The adoption of ISO/TC67 standards is accelerating internationally. API has now adopted 75 ISO standards. In the last two years the Russian Federation adopted 30 of the 145 published ISO/TC67 standards as national standards. The Gulf Standards Organization (which provides standards for Saudi Arabia, Bahrain, Qatar, UAE, Oman, and Kuwait) has adopted 50 ISO/TC67 standards. Over the last four years China and Kazakhstan have adopted 57 and 94 standards respectively, and in the last 10 years the European Committee for Standardization (CEN, representing 30 member countries in Europe) adopted 124 standards.[38]

Adoption simply means that an international standard (typically ISO) is embraced by the national standards organization (in this case ANSI/API) as a national standard. The standard may be revised to accommodate national and regional differences. The national adoption must include identification and explanation of these deviations. Unless national laws and regulations dictate otherwise, a company may follow the guidance in an international standard whether or not it is domestically adopted.

[35] API, *Procedures for Standards Development,* 3rd ed. (May 2006, approved by ANSI September 2006), 3.
[36] Ibid.
[37] Ibid.
[38] David Miller, Director, Standards, API, e-mail message to Commission staff, February 16, 2011.

Revisiting and Updating

A five-year review cycle is stipulated by ISO, ANSI, and API. Technological evolution, new methods and materials, new quality or safety requirements may render a standard out of date. Therefore, ISO has established the general rule that all standards should be reviewed at intervals of not more than five years.[39] In the ANSI review process, the review team must revise, revoke, or reaffirm each existing standard every five years. This is a large task performed by industry volunteers and trade associations.

API follows a different review process: If a standard has not been revised by the end of year four of the five year period, API staff will advise the responsible standards committee, who will then a) revise the standard, b) reaffirm it, or c) withdraw it. The standards committee may ask its parent committee for an extension of up to two years for the revision, reaffirmation, or withdrawal of a standard. Any standard that is not acted upon (revised, reaffirmed, or withdrawn) at the end of seven years will be administratively withdrawn as an API standard. Requests for extensions should demonstrate that work is underway to revise, reaffirm or withdraw the document.[40]

API Standards Process

The API Procedures for Standards Development state that "API committees responsible for standards development shall maintain written procedures in accordance with API Policy 602 addressing individual committee organization, scope, membership, and conduct."

For the API Upstream Process, this is further delineated in the API document "Organization and Procedures for Standardization of Oilfield Equipment and Materials: Policy and Procedures Guide", API S1, available at API's Standards Committee website,[41] the following is stated in 5.3, Subcommittees, and in particular 5.3,3.1, Membership General:

"Members of a subcommittee shall be representatives of companies or other interests whose business is directly and materially affected by the activities and standards under the subcommittee's jurisdiction. Members may include users and manufacturers of products covered by the standards, plus other particularly qualified individuals. They shall be qualified by reason of training, experience, and company responsibilities."

Likewise, S1 defines voting members as follows, **"**[a]ny member of the ECS,[42] a subcommittee or of a task, work, resource, or advisory group designated by their company to vote on consensus issues."

---

[39] "How are ISO Standards Developed?" International Organization for Standardization.
[40] API, *Procedures for Standards Development*, 8.
[41] "CSOEM: Committee on Standardization of Oilfield Equipment and Materials," API Energy, http://mycommittees.api.org/standards/ecs.
[42] Ibid., 2. The ECS is the Executive Committee on Standardization.

The document also provides information on how standards are progressed through the API committee approval process and provides an organizational model in Figure 1. In essence, while the API "Procedures for Standards Development" provide information on how the API standards process meets the ANSI essential requirements for balloting, comment resolution, etc., the individual committees have procedures for how subcommittees are organized and standards are progressed, and are available on the API Standards Committee website.

According to API's *Procedures for Standards Development*, "API standards reflect current industry practices and encourage best practical environmental and safety performance throughout industry." Current industry practice, however, is not necessarily equivalent to "best" environmental and safety performance. Steps should be taken to ensure timely sharing of industry research and operational experiences to further strengthen the standards process.

API plainly possesses considerable, longstanding technical expertise and has certainly authored many widely used standards, especially with regards to equipment and general practice. Also, it is important that the regulator actively participate in the standards-setting process; doing so allows it to stay current with accepted industry practices and understand the relative level of specific standards. Federal and state regulators, including staff of the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), participate in the API standards process. According to API, regulator participation is considered key to improving industry standards and safety performance.[43]

Regulators' use of standards

Standards have an important role in almost every regulatory program, regardless of a nation's culture or regulatory philosophy. In a safety management or safety case regime, the operator identifies the standards that will govern an activity, how they will be employed, how risks will be mitigated, and how management will ensure that the standards are being followed. In a prescriptive regime, the regulator requires compliance with referenced or incorporated standards, and approves and inspects operations to verify compliance.

According to OGP's *Report on Regulators' Use of Standards* (2010, Report No. 426), 1,140 different standards are referenced by the 14 regulators that were surveyed; 87% of these standards are referenced by only one regulator. This means that only 13% of the standards were referenced by two or more regulators, and implies an inconsistent application of standards among regulators.[44]

[43] David Miller, Director, Standards, API, e-mail message to Commission staff, February 18, 2011.
[44] OGP, *Regulators' Use of Standards* (International Association of Oil & Gas Producers, March 2010).

The OGP's report noted that the standards used by the 14 regulators were written by more than 60 different international, regional, national, and industry standards organizations.[45] Different organizations may write standards that cover the same subject matter. For example, at least six different organizations have developed standards covering offshore structures. In some cases, different versions of the same production safety standard are referenced by different regulators. Also, an ISO standard may differ significantly from an API standard with the same title.

Unlike many of their international counterparts, US regulators reference only specific editions of standards. This means that the regulator must incorporate new versions after they are finalized, a time-consuming and burdensome process that may delay the use of the latest technical and procedural advances. More API standards (225) are referenced than those of any other standards development organization. However, almost half of those references are by U.S. regulators, and 49 of the references are for production measurement standards.

In the U.S., promulgating regulations is a long, costly, and difficult process. Two years is typically required per standard, and some new rules have taken a decade or more to finalize. By requiring compliance with standards, the regulator may opt to use the expertise held by industry and various standard-setting organizations while minimizing the burdensome process of promulgating rules.

[45] OGP's report *Regulators' Use of Standards* analyses standards referenced by the following regulators :

- Canada, represented by:
  - Canada-Nova Scotia Offshore Petroleum Board (CNSOPB)
  - Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB)
  - National Energy Board (NEB)
- China National Offshore Oil Company (CNOOC), China
- Danish Energy Agency (DEA), Denmark
- Department of Labour (DoL), New Zealand
- Department of Mineral Fuels (DMF), Thailand
- Ministero dello Sviluppo Economico (MES), Italy
- National Agency of Petroleum, Natural Gas and Biofuels (ANP), Brazil
- National Offshore Petroleum Safety Authority (NOPSA), Australia
- Oil Industry Safety Directorate (OISD), India
- Petroleum Safety Authority (PSA), Norway
- Russia represented by:
  - The Ministry of Natural Resources of the Russian Federation (MNR)
  - The Ministry of Industry and Energy of the Russian Federation (Minpromenergo)
- State Supervision of Mines (SODM), The Netherlands
- UK Health and Safety Executive (HSE), UK
- United States represented by:
  - US Coast Guard (USCG)
  - US Minerals Management Service (US MMS).

Ongoing and Future Work

The International Regulators Forum, at its October 2010 conference in Vancouver, discussed a number of consensus recommendations to improve offshore safety including the following:

> *Regulators should serve as catalysts for learning by distributing information, hosting workshops, participating in research, and identifying gaps in standards and best practices. Wherever possible, the best standards should be identified and applied internationally.*[46]

The regulators agreed that the Netherlands and the U.K. would take the lead on assessing options for evaluating existing standards and applying them internationally. The two were expected to report back to IRF members during the first quarter of 2011 with a proposed action agenda.[47]

[46] "Conference Summary," International Regulators' Forum, http://www.irfconference2010.com/showcontent.aspx?MenuID=940.
[47] Elmer "Bud" Danenberger, interview with Commission staff, December 17, 2010.