International Association of Oil & Gas Producers

Oil Spill Response

Global Industry Response Group recommendations

Report No. 465
May 2011

OGP Vision, Mission and Objectives

Vision

To work on behalf of the world's oil and gas exploration and production (E&P) companies to promote safe, responsible, and sustainable operations.

Mission

- To facilitate continuous improvement in HSE, security, social responsibility, engineering and operations.
- To undertake special projects and develop industry positions on critical issues affecting the industry.
- To create alignment between oil & gas E&P companies and with relevant national and international industry associations.
- To advance the views and positions of oil & gas E&P companies to international regulators, legislative bodies and other relevant stakeholders.
- To provide a forum for sharing experiences, debating emerging issues and establishing common ground to promote cooperation, consistency and effectiveness.

Objectives

- To improve understanding of our industry by being a visible, accessible, reliable and credible source of information.
- To represent and advocate industry views by developing effective proposals based on professionally established technical arguments in a societal context.
- To improve the collection, analysis and dissemination of data on HSE and security performance.
- To develop and disseminate good practice in HSE, security, engineering and operations continually improved by feedback from members, regulators and other stakeholders.
- To promote awareness and good practice in social responsibility and sustainability.
- To ensure that the membership is highly representative of our industry.



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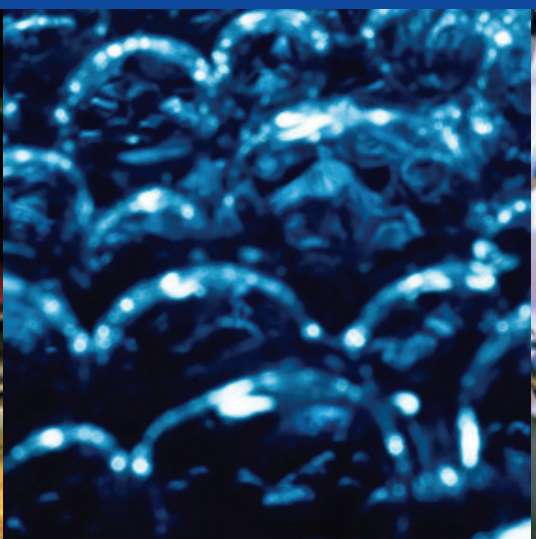
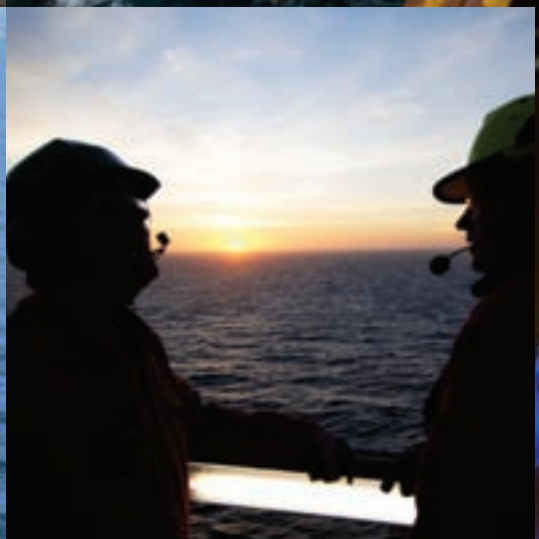
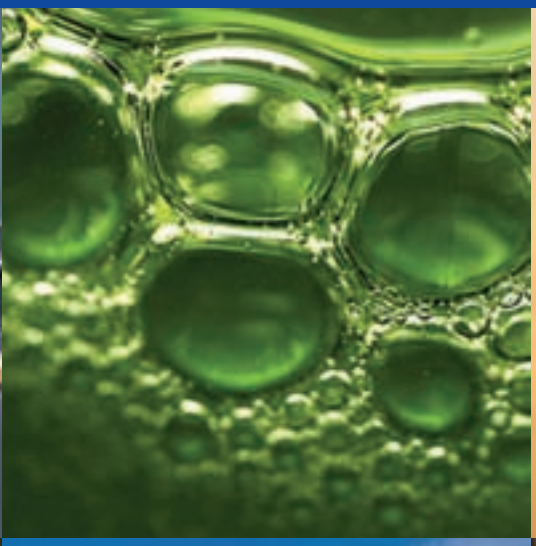









Contents






Executive Summary

GIRG

The International Association of Oil & Gas Producers (OGP) formed the Global Industry Response Group (GIRG) in July 2010 in the aftermath of the tragic accident in the Gulf of Mexico on the Macondo prospect, Montara in Australia, and other similar incidents. Previously, the oil and gas industry had drilled more than 14,000 deepwater wells around the world without major incident but, this history notwithstanding, the Macondo and Montara accidents were a reminder of the risks inherent in such operations.

GIRG aimed to ensure that the lessons learned from Macondo, Montara and other accidents are applied around the world. To do that, part of GIRG's remit is to monitor and collate the outcomes of the official Macondo and Montara accident investigations. This process is helping to identify and answer other questions about Macondo, Montara and other deepwater operations.

GIRG is working in three areas:

- Prevention: developing better capabilities and practice in well engineering design and well operations management in order to reduce the likelihood of future incidents
- Intervention: improving well capping response readiness (in the event of an incident) and to study further the need for, and feasibility of, global containment solutions
- Response: delivering effective and fit-for-purpose oil spill response preparedness and capability

OGP formed three teams of technical experts to address these objectives: Well Engineering Design and Equipment/Operating Procedures; Capping and Containment; and Oil Spill Response. Each team has prepared a report documenting its work in support of GIRG's objectives. This report documents the conclusions and recommendations of the GIRG-Oil Spill Response (OSR) Team.

Scope for the Oil Spill Response Team

To further enhance response capabilities, in the unlikely event that a well incident occurs, the Oil Spill Response Team was tasked with addressing issues arising from recent spill events and response efforts. While the oil spill response to the Macondo spill is widely acknowledged to have been successful, post-event analysis has created potential opportunities to further strengthen future spill response protocols and technologies, which could potentially be developed as 'good practices' and promoted internationally. The Team also documented issues that might not have direct relevance to the Macondo response but could potentially have been an issue if the blowout had happened elsewhere. Longer–term issues were also identified.

The GIRG-OSR Team consisted of over forty specialists drawn from environmental management and oil spill response within the member companies. It mirrors similar teams set up elsewhere in GIRG. This report summarises the work and recommendations of the Team drawn up over the course of almost a year and provides recommendations in ten basic areas.

Results

The Team recommends that the member companies of OGP and IPIECA form a Joint Industry Project (JIP) to execute, inter alia, the following activities:

- Conduct work to further enhance the understanding of dispersants, their net environmental benefits and effects, and where and when they can be used, as well as the techniques for monitoring dispersed oil following treatment, both surface and subsea. Improvement opportunities to the dispersant supply chain will be identified, as will alternative aerial dispersant application platforms, as many of the Hercules airframes currently in use reach the end of their life in the coming years
- Develop a range of supporting documents, approval protocols, and standard methodologies on In Situ Burning to further optimise its use in the future
- Further develop industry spill response and risk/hazard assessment models and make them even more widely available in order to further advance the understanding of a spill event and its consequences
- Develop a recommended practice on response exercises which includes a set of good practices on notification, assessment, communications, personnel availability, resource mobilisation and equipment deployment, cross-border movement of equipment and personnel, as well as testing of an overall command and control structure
- Develop a recommended practice on the surveillance methods and technologies for tracking oil spills
- Continue to assess global oil spill response base capacity in order to help identify the need for and potential location of any additional resources, now and into the future
- Review existing oil spill trajectory and subsea plume dispersion models and identify potential improvement areas
- Capture and document the communications tools used in managing the Macondo response effort and make this information available as an example of good practice for other companies/organisations/countries
- Produce a recommended practice on mobilising, managing and integrating military and volunteer responders
- Further enhance documentation of crude oil types and the properties typically important in oil spill response by gathering additional data from operators on the range of fresh and weathered oil characteristics that potentially might influence the ability to respond, and the appropriate manner of responding, to oil spills.

1.0 OGP'S Global Industry Response Group (GIRG)

OGP and GIRG

The International Association of Oil & Gas Producers (OGP), announced the formation of a Global Industry Response Group (GIRG) on the 14th of July 2010. The overall objective of the OGP GIRG was to discuss and devise practices to:

(a) Improve drilling safety and reduce likelihood of a well incident

(b) Decrease the time it takes to stop the flow from an uncontrolled well

(c) Improve both subsurface and surface response capabilities

GIRG did this by identifying and gathering work being done by OGP's member companies and associations, and national regulators, in response to the Macondo and Montara accidents and other well incidents.

After the announcement of the plan to develop a Marine Well Containment System (MWCS) for the Gulf of Mexico, other oil and gas companies, governments and authorities raised questions on the potential need for and desire to have similar capability available in different regions around the world.

Some individual initiatives had already started among operators and national associations, and some coordination was needed between these initiatives to avoid duplication and inconsistency.

GIRG was tasked to examine the industry's capability to prevent and respond to a major well incident and identify opportunities for improvement.

Structure of GIRG and setup of Sub-Groups

In order to achieve these objectives, three separate GIRG sub-groups were established to focus on Prevention (Well Engineering Design & Equipment/Operating Procedures Team), Intervention (Capping & Containment Team), and Response (Oil Spill Response Team). *See Figure 1.1.*

Prevention is the most effective way to reduce the risks from well control events, and remains a primary focus for the industry's work. Improvements to oil spill response, and capping and containment, could reduce the consequences of an event.

Over the past year more than 100 industry specialists have worked on these three teams. These teams have established cooperation with other existing industry efforts, such as MWCC, API JITF, OSPRAG, OLF, IADC, API, and specialist service providers *(e.g. OSRL)* and continue to work closely with them to align efforts and eliminate duplication where possible.

OGP'S Global Industry Response Group (GIRG)
continued

- The Well Engineering Design & Equipment/Operating Procedures Team is looking into improvements in well design and procedures and has brought forward recommendations. It is likely that some of the most significant reduction in the risk of deepwater drilling will come from work in this area.
- The Capping & Containment Team was tasked to determine whether a single worldwide standardised capping and/or containment system (outside the Gulf of Mexico) could and should be designed and deployed with the support of international and national associations, in consultation with governments and regulators. The Capping and Containment Team was a full-time 12-person Team that included specialists from BG Group, BP, Chevron, ENI, ExxonMobil, Petrobras, Shell, Statoil, and Total.
- The overall purpose of the GIRG-Oil Spill Response (OSR) Team was to gather and share information and conclusions on oil spill response performance from members and member associations in respect of Macondo and similar accidents, distil learning points and recommend possible improvements for OGP/IPIECA action.

OGP will continue to monitor developments in this area and will continue to assess the need for any additional activities that might be required to assist in achieving the objectives of GIRG.

This document summarises the conclusions and recommendations, for OGP/IPIECA action, of the Oil Spill Response Team following the collection and evaluation of oil spill response performance information associated with the Macondo and Montrara accidents and other relevant spill responses.

Separate documents have been prepared that summarise the findings and recommendations of the Wells Engineering Design & Equipment/Operating Procedures and Capping & Containment Teams.

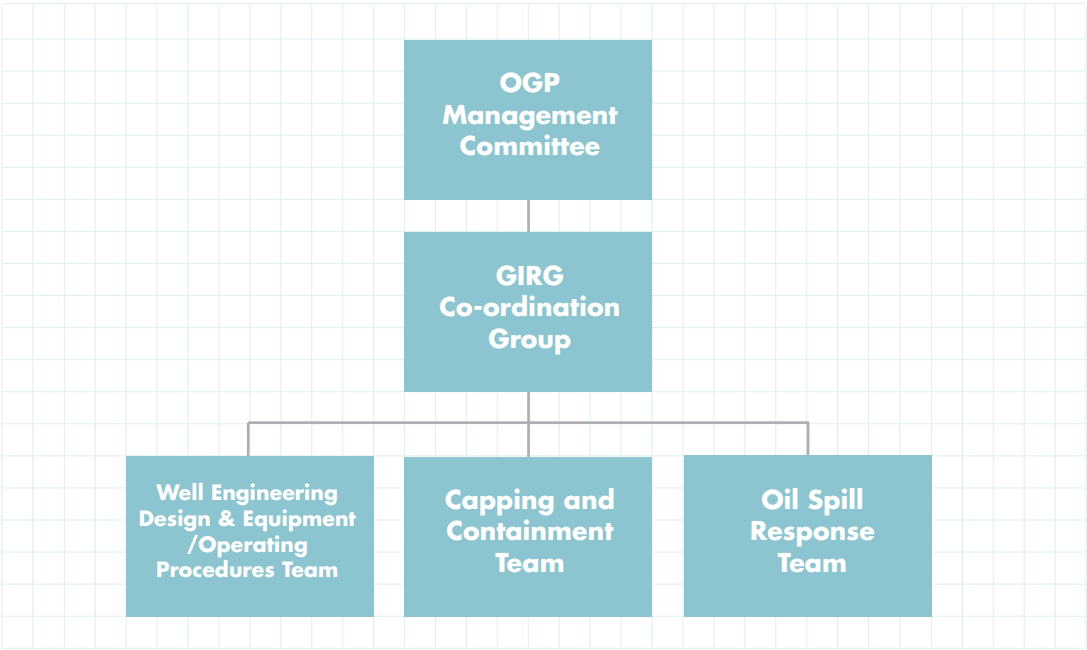


Figure 1.1 *Organisational structure of GIRG*

2.0 Findings & Recommendations of the Oil Spill Response Team

1. Dispersants

Given the right conditions, the surface and subsurface use of dispersants can substantially improve the efficacy of an oil spill response and their use should be considered alongside other response options such as mechanical recovery and "In Situ" Burning. The use of dispersants can also play an important safety role, such as during the Macondo accident, by limiting their exposure to volatile organic compounds (VOCs) from the released hydrocarbons. However, additional steps should be taken to ensure all stakeholders are familiar with the potential environmental benefits and limitations of dispersant use. Although an extensive body of knowledge already exists on dispersants, industry should consider devoting additional resources and time to further expanding the understanding of the environmental benefits, limitations, and challenges associated with dispersants, particularly when used subsea (below the ocean surface but above the ocean floor) in conjunction with a containment and/or capping operation. To that end, GIRG is proposing the formation of a Joint Industry Project (JIP) to work with the American Petroleum Institute (API) in conducting further research to continue to develop the understanding of the potential longer-term environmental and toxicological effects of dispersants and dispersed oil with a view to reaching a scientific consensus on effects. This information, coupled with the significant information already available, will serve to underpin decision-making on approval for future use.

There is no universally recognised framework for evaluating and gaining regulatory approval for dispersant use, which could limit the supply chain and dispersant availability during a large spill event. The International Maritime Organization (IMO) will be approached to co-ordinate the development of an agreed global framework for dispersant testing and regulatory approval for both surface and subsea use.

Dispersant supply plans can be developed by industry to demonstrate how adequate supplies of pre-approved dispersants can be accessed and maintained in a prolonged response through pre-identifying the logistics of product delivery and the "ramping-up" of manufacturing capability. Global dispersant supply chains will be catalogued by the JIP.

The US-designed Special Monitoring of Applied Response Technologies (SMART) protocol has been widely used and is accepted by the regulatory authorities in the US for surface-applied dispersants, but its use is not widespread outside of the US. The SMART protocol should be evaluated for worldwide application and, if found suitable, implemented through incorporation in an industry good practice document to be developed by the JIP.

The SMART protocol for water column monitoring is accepted in the US for surface (but not subsurface) dispersant application. Additional work would be helpful to support the development of a widespread consensus regarding good practices to monitor the effect of subsurface dispersant application and the manner in which oil released at depth is transported and weathers. It is recommended that the methods used on Macondo for tracking oil in the water column be reviewed by the JIP and a recommended practice developed for international use. Longer–term, the JIP should also evaluate technology for sampling and tracking dispersed oil plumes using Autonomous Underwater Vehicles (AUVs).

Aerial deployment of dispersant requires suitable aircraft. The existing Hercules fleet, which currently performs this task, is coming to the end of its operational life. While in the US there are still many available mid-life aircraft, elsewhere some of these aircraft may be withdrawn over the next 5 – 10 years. GIRG believes that industry should consider looking ahead to the replacement of the ADDS pack/Hercules option with other aircraft and dispersant delivery systems. GIRG believes this can be best achieved by the Oil Spill Response Organisations (OSROs) working with aircraft manufacturers to define future aerial dispersant capabilities.

Findings & Recommendations of the Oil Spill Response Team
continued

2. In Situ Burning (ISB)

Given the recent success of this technique during the Macondo accident, a range of documents, global protocols, and standard implementation methodologies will be developed by the JIP to optimise its use in the future.

3. Assessing Response Preparedness

Industry should consider further enhancing industry spill response and risk/hazard assessment models (and making them publicly available) in order to further improve the understanding and quantification of the likelihood of a major spill event and its consequences. The models may also help to confirm that an appropriate response capability is in place. Oil spill response plans should clearly describe the ability and process to cascade additional resources from a range of local and international sources for escalating the response up to the worst case discharge. When these models and guidelines are completed, a recommended practice can be developed along with a communication package for industry to inform the regulators and other stakeholders.

4. Effective exercises

Consideration should be given to further refine exercises to test all aspects of oil spill response capability. This can include notification, assessment, communications, personnel availability, resource mobilisation and equipment deployment, cross-border movement of equipment and personnel, as well as testing an overall command and control structure. A recommended practice on response exercises will be developed by the JIP and inculcated in member companies.

5. Surveillance of Oil Spills

Current practices for the surveillance and tracking of oil spills are region specific and it is not clear whether current practices fully capitalise on the range of emerging technologies. Given the cross-functional nature of imagery and geospatial data in any oil spill response, an expert committee will be formed by the JIP to develop a recommended practice on the surveillance and tracking of oil spills. Terms of reference for this committee may include the development of a recommended practice in cooperation with existing OGP Geomatics, Environment, Metocean and Safety Committees and the IPIECA Oil Spill Working Group and IPIECA Global Initiative.

Findings & Recommendations of the Oil Spill Response Team
continued

6. Tier 2 and Tier 3 Capability

The present model of Tier 3 response organisations and their location will be reviewed by the JIP to confirm their continued fitness for purpose. The need for an increase in Tier 2 locations closer to areas of perceived risk, to provide the potential to respond before the arrival of the Tier 3 resources, will also be considered. The JIP will reassess its response capacity for existing Tier 2, Tier 3 and commercial global response bases in order to help identify the need for the potential location of any additional resources, now and into the future.

7. Oil Spill Trajectory and Subsea Plume Modelling

During a spill response, there is a need for adequate real-time and predictive data on oil plume trajectories. Existing methodologies and models for oil spill modelling will be reviewed by the JIP and areas for improvement identified. The Team recommends that state-of-the-art models to establish the likely trajectory of oil on the surface and subsurface oil plumes should be developed.

8. Communications: forming a "Common Operating Picture"

During the Macondo response there was significant innovation in the use of communications and IT technical tools over a wide range of activities in the management and tracking of the response. The communications tools used in managing the Macondo response effort should, to the extent possible and appropriate, be documented by the JIP and recommended as an example of a good practice for other companies/organisations/countries.

9. Mobilising, managing and integrating responders in-country

Globally, different approaches exist in relation to the mobilisation and use of government-controlled resources, including national guards, militaries, etc. as responders to major spills. Consideration should be given to formalising industry good practice on volunteer management. The JIP will look to develop a recommended practice and an accompanying communications package on the interface between government-controlled resources and industry, as well as the use of volunteers. Mobilising, managing and integrating military, domestic forces and volunteer responders will also be addressed in the recommended practice.

10. Responding to different types of oil

There are databases available that document crude oil types against the properties that are important in oil spill response. This data can be further enhanced by gathering additional information from operators on the range of oil characteristics and potential changes in these characteristics due to weathering that could influence safety, behaviour, fate, potential effects and response options/techniques. The JIP will undertake this research.

More detailed recommendations, as set out in the OSR Team's Technical Report, – for example those addressing Personal Protective Equipment, Decanting and Indemnity – will also be identified and picked up by the appropriate work stream *(see GIRG chart)*.



3.0 Conclusions

The Team concluded that the preferred way to address the work streams outlined above is by means of a JIP funded by industry. While governance for the JIP would be provided by the funders, it is envisaged that there would be a consultative process with industry experts, OSROs, and others, as shown in Figure 2.1.

Collaboration with other initiatives

Many of the work streams are contingent on, or related to, work proposed by API and every reasonable effort should be made to link into these projects.

Recommendations

1. The Team recommends that a series of activities be initiated under the umbrella of a Joint Industry Project in order to address some of the above work streams as appropriate.
2. The Team recommends that the remainder of the work identified is addressed through other stakeholders, e.g. by OGP, IPIECA and others, rather than through a JIP.

The chart that follows identifies the allocation of responsibilities.

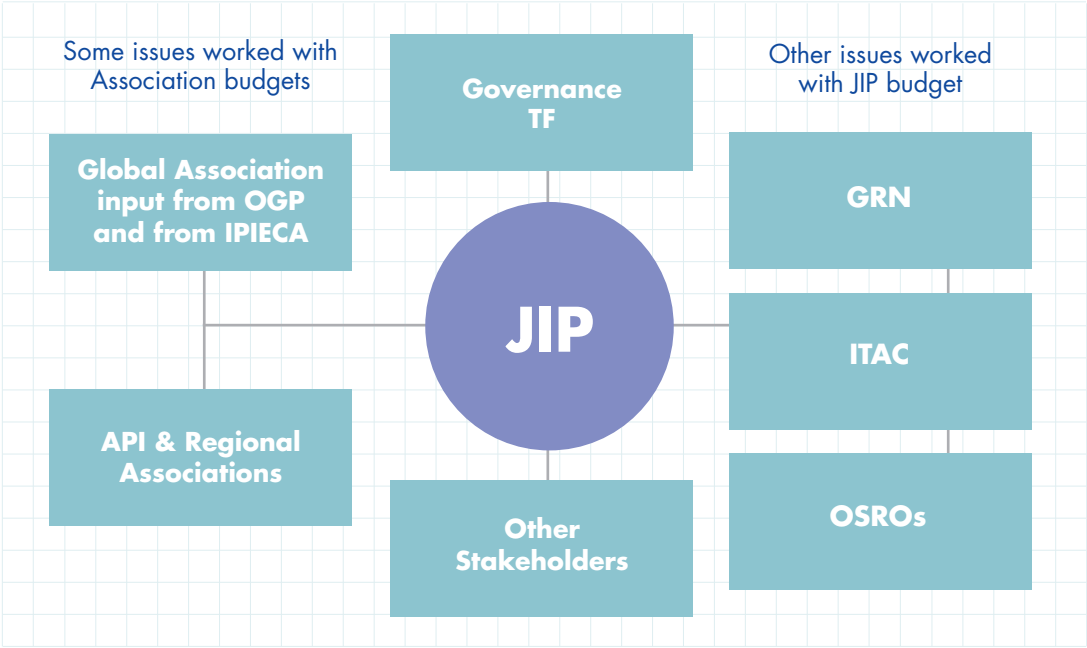
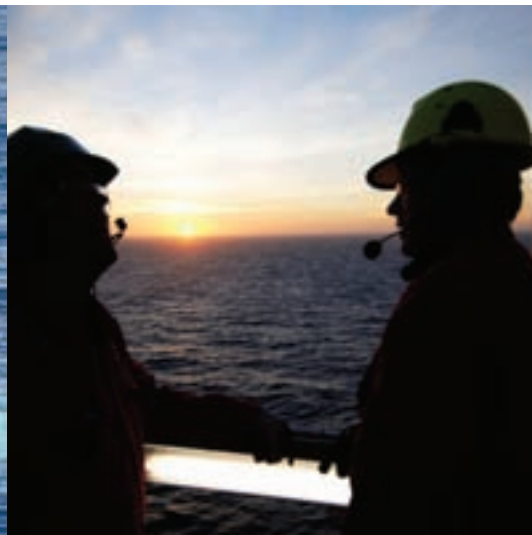


Figure 2.1 *Proposed organisation of JIP*



Allocation of GIRG work streams

Finding Description	API	IPIECA	OGP	OSROs	JIP	Comments
1 Inform decision-makers on the value of dispersants	L	S		S	L	To be done jointly with API project D1 (Dispersant Communication Tools).
2 Environmental Effects of Dispersants	L	S		S	S	Part of this activity to be done jointly with API projects D2 and D3. This material will be adapted for use on a global basis where possible. Output to be incorporated in the IPIECA good practice series.
3 Dispersant Approval & Supply Chain		S		L	S	Different for every country. The OSROs will work with countries involved in Deep Water Oil/Gas activities to define the country regulatory approval process and encourage dispersant manufacturers to license the appropriate use of their product(s). OSROs and companies will work with dispersant manufacturers to develop dispersant supply plans as part of the normal contingency planning process, and incorporate this as an element of good practice in revisions to the IPIECA Oil Spill Report Series.
4 Dispersant Effectiveness Monitoring		S		S	L	JIP will review U.S. SMART protocol for surface dispersant monitoring and adapt to global use. Output to be incorporated in the IPIECA good practice series
5 In Situ Burning (ISB)	L	S		S	L	Will take API ISB-1 & use globally where possible. Output to be incorporated in the IPIECA good practice series
6 Assessing Response Preparedness	S	S		S	L	Will develop preparedness assessment models and Recommended Practice on Risk/Hazard assessment. Output to be incorporated in the IPIECA good practice series
7 Effective Exercises		S		L	S	Will be incorporated as part of revision to the IPIECA/IMO good practice document on Oil Spill Exercise Planning

(L=Lead, S=Support)

Allocation of GIRG work streams
continued

Finding Description	API	IPIECA	OGP	OSROs	JIP	Comments
8 Surveillance of Oil Spills			L	S		OGP Metocean committee lead
9 Tier 2 and Tier 3 capability			S	L		White paper to be developed by consultant
10 Oil Spill Trajectory and Subsurface				S	L	Managed by JIP with OSRO support Plume Modelling
11 Communications: forming a "Common Operating Picture" input from member companies where practicable				S	L	JIP will lead, but will require case study
12 IPIECA Oil Spill Working Group Report Series update to "OGP-IPIECA" good practice series		L	S	S	L	IPIECA will take the lead and will support some of this work alongside the JIP
13 Indemnification of responders, oil spill response equipment and associated materials	L	S		S		Will take into consideration API project P3a and use this material where possible: will form part of IPIECA good practice series
14 Airborne Dispersant Delivery Systems (ADDS)				L		Non–U.S. OSROs will take lead on this issue
15 Mobilising, managing, and Integrating responders in-country	S			S	L	JIP will lead: some input from API may be useful: will form part of good practice series
16 Monitoring Oil in the Water Column	L	S			S	Will take into consideration API work as part of project D3, and use this material where possible: output will form part of IPIECA good practice series
17 Decanting of Temporary Offshore Storage Devices (TSD's)		S			L	JIP led consultant project: will form part of IPIECA good practice series
18 Use of Personal Protective Equipment (PPE) During Spill Response	S	L	L	S		Will take into consideration API project SP1 and use this material where possible: will form part of IPIECA good practice series
19 Response to different types of oil				S	L	Consultant led project to improve oil assay data collection and availability

Glossary

ADDS	Aerial Dispersant Delivery System
API	American Petroleum Institute
API JTF	American Petroleum Institure Joint Industry Taskforce
APPEA	Australian Petroleum Production & Exploration Association
AUVs	Autonomous Underwater Vehicles
BOP	Blowout Preventer
CMS	Competency Management System
Containment	System used to bring leaking oil from a subsea wellhead in a controlled way to the surface for storage and disposal
Deepwater	Greater than 300m
Deepwater Horizon	Rig that operated on the Macondo prospect in the Gulf of Mexico (see Macondo)
Dispersant	A group of chemicals used to accelerate the process of natural dispersion of oil (both at the surface and subsurface)
DP	Dynamic Positioning
E&P	Exploration & Production
GIRG	Global Industry Response Group
HWCG	Helix Well Containment Group
IADC	International Association of Drilling Contractors

Glossary
continued

IBP	Brazilian Petroleum Institute
IMO	International Maritime Organization
In Situ Burning	The process of burning surface oil at sea, at or close to the site of a spill
IPIECA	International Petroleum Industry Environmental Conservation Association
ISO	International Organization for Standardization
ITAC	Industry Technical Advisory Committee
JDA	Joint Development Agreement
JIP	Joint Industry Project
Macondo	Oil and gas prospect in the Gulf of Mexico. Also used as shorthand for the Deepwater Horizon drilling rig accident that took place on 20 April 2010
Montara	Oil field in the Timor Sea off the northern coast of Western Australia. Also used as shorthand for the blowout from the Montara wellhead platform that took place on 21 August 2009
MWCC	Marine Well Containment Company
NEBA	Net Environmental Benefit Analysis
NOGEPA	Netherlands Oil & Gas Exploration & Production Association
NOIA	National Oil Industry Association
NORSOK	Norwegian Petroleum Industry Standards

Glossary
continued

O&G UK	Oil & Gas UK
OGP	International Association of Oil & Gas Producers
OLF	Norwegian Oil Industry Association
OSPRAG	Oil Spill Prevention and Response Advisory Group (UK)
OSRL	Oil Spill Response Limited
OSRO	Oil Spill Response Organisation
R&D	Research & Development
SMART	Special Monitoring of Applied Response Technologies
VOC	Volatile Organic Compound
WCD	Worst Case Discharge
WEC	Wells Expert Committee
Well cap	Device deployed to control a well incident at source
Well incident	Uncontrolled event *e.g. blowout*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