Improvements in Intervention and Response since Macondo

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OPENING SLIDE

Good Morning. My name is Robert Limb. I am the CEO of Oil Spill Response Limited (OSRL) and have been working in both the Upstream and Downstream Oil and Gas Industry for the past 34 years. I joined OSRL just over a year ago and became CEO on the 1st April last year.

I would like to thank the leadership of the Petroleum Association of Japan for their gracious hospitality and the invitation from Mr Jun-ichi Hatano, Managing Director of the PAJ to speak at this Symposium which is focussed on the Organisational and Technical developments in Oil Spill Preparedness and Response following recent oil spill incidents.

It is opportunities like this which enable relations to be built so that together we can improve the overall capability of the oil spill industry. It is now almost 4 years since the Macondo incident. During that time a great deal of work and investment has been made by many people and Companies across the world in order to improve our capabilities. This Symposium is a wonderful chance to share these accomplishments and gain a better understanding of future developments.

Finally, before I start with my presentation, I would like to recognise and thank the PAJ's great team of translators who worked to translate my English into Nihon-Go. My promise to you and them is to try and talk slowly. This may prove difficult when I presenting a subject that I am excited and passionate about. But let's give it a go!!

SLIDE 2

By way of background; who is Oil Spill Response Limited (OSRL)? We are owned by the Oil & Gas (O&G) industry with 43 participant shareholder Members' and more than 120 Associate Members'. Together they represent over 70% of global O&G production. OSRL works with its members to prepare for and respond to Oil Spills anywhere in the globe and in the past 30 years we have attended more than 400 spills. Fortunately, 2013 was a quite year; despite this we still attended 14 Spills from Thailand, Yemen to the Amazon River basin in South America. We have also worked closely with other industry partners such as IMO, OGP and IPIECA to share expertise and knowledge. Traditionally OSRL only provided surface oil spill response but in 2013, at the request of industry, we took on the responsibility to provide a global subsea well intervention service which we call SWIS, more of this later.

SLIDE 3

As you can see from our Mission statement our remit is to provide a global response capability. To enhance this in 2013, we added three new geographic locations in Brazil, Norway and South Africa. We also relocated and expanded our facility in Singapore to accommodate the new intervention services and our increased dispersant stockpile. We also integrated the former Clean Caribbean and Americas OSRO into the OSRL family and in so doing inherited a new base in Fort Lauderdale in Florida, USA.

SLIDE 4

Before I talk about what OSRL has being working on I thought it might be useful to provide you with an Industry Perspective. This summary has been put together based on the feedback we received from our Members.

SLIDE 5

As always Safety is paramount. We are also beginning to see, as a result of pressure from both the Public, NGO's, Governments and the Regulators, that having an effective and importantly a tested and verified response is fundamental in obtaining and maintaining a license to operate.

SLIDE 6

Thanks to for improvements initiatives promoted by the IMO; such as double hull tankers, relocation of bunker storage tanks etc. We have seen a year on year reduction in both the size and number of spills from vessels. Conversely, with the tremendous build up in offshore activity in the Oil and Gas industry over the past 30 years we have seen more frequent incidents. These are occurring for various reasons but most notably because of; aging infrastructure, more well control incidents and increasing numbers of subsea wells. Furthermore, activity is moving into more challenging environments which make it harder to respond should an incident take place.

SLIDE 7

With the increase in Upstream related incidents and following the high profile Montara and Mocondo well blow outs, industry got together to try address the problem. Notably amongst these initiatives was the setting up of the Global Industry Response Group (GIRG) by the International Association of Oil and Gas Producers (OGP). GIRG focused its efforts on three core issues:

Firstly - Prevention:

What improvements did we need to identify and implement in well engineering design and operations management?

Secondly -Intervention:

If, despite every effort to prevent a deep water well failure, such an event did occur, how should the industry ensure readiness to cap a blow out? And was there a need for global containment solutions?

Finally, the third was devoted to Oil spill response:

How can we ensure delivery of an effective oil spill response through enhanced preparedness and capability for every offshore spill, no matter the actual size and scale of the incident.

In May 2011, OGP published the GIRG recommendations. On the basis of these recommendations multiple focussed groups were created to deliver the required solutions together with the necessary equipment and procedures. For intervention the Subsea Well Response Project (SWRP) was set up to design and procure the Capping and Containment equipment which OSRL now owns. For Oil Spill Response three closely linked groups were set up being the American Petroleum Institutes – Joint Industry Task Force (JITF), OGP-IPEICA Joint Industry Project (JIP) and for the Arctic the OGP Arctic-JIP.

SLIDE 8

Industry and many of the regulators are now requiring that intervention be part of the oil spill contingency plans (OSCP's) for all subsea drilling and production activities. In addition, these plans frequently require the worse case scenario to be considered which may in turn dictate a faster response with many more resources and the use of multiple tools simultaneously.

SLIDE 9

Industry now expects the Oil Spill Response Organisations (OSRO's) to work together to ensure that best practices are shared and to enhance cooperation and support in the event of a major incident. This has lead to closer relationships being fostered through organisations like the Global Response Network (GRN), mergers and the creation of formal alliance agreements between OSRO's. These agreements help facilitate the involvement of multiple GRN members in exercises, promote the sharing of training facilities and resources. With the new mantra being: Collaboration, Convergence and Consistency.

SLIDE 10

For OSRL this has resulted in our members requiring more and better trained responders. We have seen a significant increase in the demand for training, consultancy, personnel secondments and the provision of rental equipment packages. There is also an expectation that OSRL should have a broader and

deeper technical capability to include such activities as modelling, SCAT, ICS and surveillance from both aircraft and satellites. Industry has chosen OSRL to be the vehicle to own, support and provide intervention resources. In addition, we are working to improve our capabilities to provide support for oiled wildlife and an arctic response.

SLIDE 11

Given these changing needs and expectations what has OSRL been doing to address them?

SLIDE 12

As in any response organisation people are the key element to ensure a positive outcome to any incident. To meet the demands of industry in the past two years OSRL has more than doubled the number of personnel. Amongst these new employees we have hired specialists to enhance our capabilities in areas such as; ICS, Logistics, Modelling, Subsea, SCAT and Surveillance. We have expanded the scope and time spent on training for all our employees to include programmes for Cold Weather, Wildlife and enhanced safety training through NEBOSH certification. We have refined the initial training we give by redesigning the old “offline course” into a new 12 week “Spill Responders Course.

SLIDE 13

This slide shows the key elements of the course; this includes both theoretical and practical elements that are achieved through the deployment of 5equipment offshore, along shorelines, in rivers and on land.

SLIDE 14

To track all the training we provide and to make sure we continue to develop our technical bench strength we have an online competency management programme accredited by City and Guilds in the UK. This system is designed to ensure that our people are exposed to many different elements of a response while at the same time making sure they receive timely refresher training and are kept current with the most recent technical developments.

SLIDE 15

While we continue to invest in new technologies it is important that the responders are trained to deploy these systems. One area that grew significantly during last year was the Subsea Well Intervention Services. With the establishment of the new bases and delivery of equipment we now have almost 50 people dedicated to this effort. The majority of these people are fully trained responders. Today we have in excess of 160 trained responders that can be mobilised to an incident. OSRL continues to be a source of trained personnel for our Members; this is a win-win for both parties, facilitating a more seamless integration between the parties during a spill. Our diverse group of employees gives us a significant multi-lingual capability which is essential for a global response organisation.

SLIDE 16

Being able to provide a wide range of preparedness solutions is a prerequisite to delivering a timely and appropriate response during an incident.

In many countries the preparation of detailed Oil Contingency Plan is mandated in legislation. To do this many of the consultancy activities listed on this slide need to be undertaken. Ultimately the ability to respond effectively needs to be assured. This can only be achieved by dedicated training backed up by regular exercises. OSRL have experienced more than a 300% rise in the number of exercises we participated in between 2012 and 2013. This number continues to rise to include no notice drills, desk top exercises and full mobilisations. In 2013 we mobilised significant quantities of people and equipment by aircraft to Angola, French Guyana and Kazakhstan as part of major industry exercises.

SLIDE 17

This slide illustrates the changes in the Modelling techniques being used since Macondo:

For Preparedness: we have moved from 2D to 3D models, we use experts with powerful computers to give better answers based on detailed Metocean data

and can now simulate complex scenarios delivering more expansive and dynamic results.

SLIDE 18

In a Response: again we use 3D modelling during a spill, the modelling expertise are typically mobilised, we acquire Metocean data specifically for the incident and the output is used by both the incident owner and regulator.

SLIDE 19

Oil Spill Contingency Plans (OSCP's): These are built around Regional standards with protocols established for specific areas. Typically an OSCP is integrated with the National Plan and is frequently updated when the regulations change.

Globally OSCP's are starting to use the "Good Practice Guide" recommendations from the industry working groups i.e. JIP, JITF etc.

For OSRL: We have created improved and expanded OSCP templates which undergo a more stringent technical review processes and the plans typically incorporate worst case scenarios.

SLIDE 20

Oiled Wildlife Response (OWR) is increasingly required as part of the preparedness planning and response. Dedicated OWR kits have been prepared to provide the basic equipment to initiate a response. A network is being built encompassing ten of the leading wildlife response groups such as: Massey University in New Zealand, SANCCOB in South Africa, RSPCA in UK, Aiuka in Brazil, Oiled Wildlife Care Network in the USA and others together with Sea Alarm and OSRL.

SLIDE 21

One tool that was used extensively during the Macondo incident was SCAT. This provides a systematic methodology to survey and document oiled shorelines to enable accurate prioritisation of activities by the incident team. OSRL personnel and many of its members have been trained in this technique and standard processes and guides are now available.

SLIDE 22

Moving from Preparedness through to Response - we have seen a paradigm shift in the requirements. There has been a step change in the expected speed of response and the amount of equipment that is mobilised. Given this good logistical support is now essential. OSRL has its equipment pre-packaged and custom cleared so it can be dispatched immediately to the nearest airport. Where logistic challengers make a quick response difficult we provide in country Tier 2 equipment. We are seeing more frequent "just in case" mobilisations than in the past. This typically involves the deployment of an OSRL Technical Advisor. These deployments increased by more than 800% between 2012 and 2013. The scope of the response scenarios has also expanded to incorporate both surface and subsea spills this puts even more demand on resources.

SLIDE 23

Some of the techniques that were successfully used during Macondo have been integrated in to our standard response toolkit. These include better boom systems and skimmers. The use of in situ burning requires us to store large quantities of fire boom and ignition systems. We are making substantial investments to improve our aviation response capability. During the past 18 months we also added the subsea well intervention services (SWIS) to our portfolio.

SLIDE 24

I will now provide a brief update on SWIS.

SLIDE 25

For Capping we now have five active locations: the original OSPRAG cap in Aberdeen and the four SWRP designed capping toolboxes in Brazil, South Africa, Norway and Singapore. In addition we have two Subsea Dispersant Toolboxes in Brazil and Norway.

SLIDE 26

As this equipment is new to industry substantial resources have been devoted to training and exercises. We have mobilised the Subsea dispersant toolbox by

air from Norway to Angola and deployed it successfully to more than 1000 metres water depth.

SLIDE 27

We have a ROV simulator which enables the practice and refinement of procedures by Operators in a virtual environment.

SLIDE 28

In addition to Capping we are in the process of manufacturing the Subsea Containment Toolkit. Containment may be required in the unlikely scenario that capping alone cannot stop the flow of Hydrocarbons. This may arise when there are concerns about the integrity of a well. The system is designed to safely capture and transfer up to 100,000 Barrels per day (BPD) of produced fluids to a storage tanker. Key to deploying this system is the Subsea Well Containment Guidelines these have recently been tested by several operators during a desk top exercise.

SLIDE 29

We plan to have a single leg system, capable of capturing 30,000 BPD later this year with the remaining components of the system to be in place early in 2015.

SLIDE 30

To allow a subsea intervention to take place safely the use of subsea dispersant injection will likely be needed to enable vessels and personnel to operate on the sea surface above the incident well. To ensure sufficient quantities of dispersant are available a Global Dispersant Stockpile has been established containing around 5000m^3 of the most common dispersants. Currently there are 20 subscribers to this supplementary agreement.

SLIDE 31

In some well blow out conditions, such as high volumes of produced gas or a well in shallow water, it may not be possible to operate on the surface of the water directly above the well location. For these scenarios we have been cooperating with the SWRP team to develop an Offset Installation system that could successfully cap a well from a displacement of up to 1 km. This system is

in the final evaluation stage and if the project goes ahead equipment could be available by the middle of 2015.

SLIDE 32

One of the outputs from the Joint Industry Project (JIP) was JIP 14 - Airborne Dispersant Platforms. This paper recommended that industry start a project to provide a suitable replacement aircraft to the aging Hercules that is in current use. It was also recommended that a jet aircraft be sourced to improved response times and provide an extended operating range. OSRL has been working on this project for the past 15 months and we are very close to having a tested and certified Boeing 727 Aerial Dispersant platform available.

SLIDE 33

I will now show a short video showing the final test flight of the Boeing 727.

Spray On.

You can observe a nice even swath.

The aircraft is a very stable and solid platform.

And despite very gusty conditions the final test flight was a success.

SLIDE 34

In the video the aircraft was flying at 150 feet above the sea, airspeed was approximately 150 knots and 17.5 tonnes of water was sprayed during 5 spray runs over the target. The first modified Boeing 727 should be fully certified and available in the next few weeks with a second aircraft to follow later in the year.

SLIDE 35

In addition to the Boeing 727 we have also launched an advanced surveillance aircraft which has live video, infrared and ultraviolet feeds transmitted via satellite both from a turret and fixed cameras. This aircraft provides geo-referenced images and has software to enable the perimeter of a spill to be mapped to aid the calculation of the observed volume of oil. Additional

aircraft are available in the UK, West Africa and Singapore to provide various levels of Dispersant, Surveillance and Logistics capability.

SLIDE 36

As industry continues its quest for additional sources of hydrocarbons we are increasingly faced with more challenging new frontiers. Each new area presents its own unique response challenges whether we are in deepwater or in the Arctic with its remoteness, cold, ice, darkness and severe weather conditions. Each of these require the preparation of bespoke contingency plans that can often extend lead times. Because of the logistical challenges it may also mean additional Tier 1 and 2 resources need to be made available and seamlessly integrated with the global Tier 3 capability.

SLIDE 37

Let me try and provide a little more details about Arctic response from an OSRL perspective.

SLIDE 38

This polar map shows the key areas where exploration activities have or will shortly take place. For now we have focussed our response effort on the open water season as this when the operations that are planned during the next two to three years will take place.

SLIDE 39

At OSRL we have developed an Arctic specific competence assessment process for both people and equipment. For our personnel we have created three levels and have a focussed training programme to further develop our people.

SLIDE 40

For the equipment - we have divided it into five categories, as shown on the slide. Encouragingly more the 70% of our stockpile can be used “as is” or with minor modifications in the Arctic.

SLIDE 41

This shows our current action plan to build further capacity, test our capability and build credibility in our ability to respond within the Arctic industry.

SLIDE 42

Together with the rise in industries expectations for an increased breadth and technical depth in our response capability we have seen a real step change in the management challenge that these large incidents present.

SLIDE 43

Consider, if you will, the scenario of a Macondo type incident in remote location. The first major challenge will be a logistical one; to schedule and organise the mobilisation of people and equipment to the incident location. At OSRL we have some experience of this when we mobilised just prior to Christmas 2011 for an Oil Spill in Nigeria this required the simultaneous delivery of equipment by air from the both the UK and Singapore. We mobilised an A380 cargo aircraft from Singapore and two Boeing 747's from the UK. Personnel were mobilised to the incident by various aircraft from Executive Jets to commercial airliners. Imagine if, in addition, we had to mobilise Capping and Dispersant toolboxes and tonnes of dispersant from around the globe. I hope you begin to get a sense of the magnitude of the response effort and that's just the logistics!!

When you add dealing with multiple agencies across international borders into the mix you can begin to see the enormous response effort an incident owner would be facing. As the Oil Spill Response Organisation we only have a small part of this BUT we need a proven system to integrate OUR activities into the incident owners command system.

SLIDE 44

In OSRL we have trained many people, run internal and external exercises utilising the Incident Command System (ICS). We have done this to enable the OSRL people to seamlessly integrate with the different incident management systems that our members use.

SLIDE 45

This slide shows how our base and field personnel interface with each other and the Incident owner or responsible party. This organisation is essential to ensure we maintain clear lines of communication.

SLIDE 46

Clearly a complex incident of a similar magnitude to the scenario I just touched on would quickly drain the resources of even the biggest OSRO's. To enable experienced resources from the industry funded OSRO's to be cascaded in the most efficient way we have been working together as the Global Response Network (GRN) to share knowledge and best practices. Seven Operational Teams (OT's) have been formed with experts provided by each OSRO. The OT's have created inventories of the major resources owned by each OSRO. In addition, team members and other participants come together for exercises and training sessions to share best practices and resources.

SLIDE 47

To further enhance industries ability to respond to large scale offshore incidents OGP has created a framework document on Mutual Aid. Collaborative efforts are underway in several regions to create the necessary agreements and protocols to make this a working reality. It is this unprecedented level of industry cooperation since Macondo that is delivering the impressive array of new response and intervention capabilities that I have talked about in my presentation.

SLIDE 48

Finally, I would like to conclude with a few comments:

Since the Montara and Mocondo we have seen a tremendous effort to further enhance our ability to respond to Oil Spill incidents on a global basis. Industry is investing very significant resources to deliver both the equipment and trained expertise. Furthermore, despite the funding for these projects being provide by a few major players they have given open access to all participants in the industry. This unheard of openness is driven by the recognition that a

poorly executed response by any one player has repercussions across the whole of industry.

Given this, I would encourage each of you to learn about and embrace these significant developments to ensure that they are properly understood and implemented within your own organisation.

This Symposium is a wonderful opportunity for us to get to know each other and share ideas as we seek to improve our ability to respond to Oil Spills where ever they may occur.

Thank you for your attention.