Improvements in Intervention and Response since Macondo.

Robert M. Limb  CEO Oil Spill Response Limited
Who is Oil Spill Response Limited – OSRL?

**Largest industry-owned response cooperative with global remit**

Responding to oil spills anywhere, anytime. Over 400 spills attended worldwide.

**Industry’s provider of oil spill preparedness, response and subsea well intervention services (SWIS)**

Serving stakeholders from strategic locations in the UK, Singapore, Bahrain, United States, Norway, Brazil and South Africa.

**Over 160 environmentally responsible Members**

from government, marine and energy-related sectors.

**Collaboration with industry organisations e.g. IMO and IPIECA**

to share expertise and develop knowledge.
Our Mission

The Mission of Oil Spill Response Limited (OSRL) is to provide Members with resources to prepare for and respond to oil spills effectively and efficiently on a global basis.
Current landscape from an Industry perspective
Industry Perspective

PREVENTION IS THE PRIORITY AND SAFETY IS PARAMOUNT

- Response capability is fundamental to obtaining a licence to operate
- Ineffective response is not an option
- Public expectations are high and growing
- Regulators are increasing their demands
Industry Perspective

RISK PERSPECTIVE HAS SHIFTED

- Reduction in size and number of shipping related incidents
- Significant upstream well control incidents
  - Montara, Australia
  - Macondo, Gulf of Mexico
- E&P activity is moving to more challenging environments
  - Arctic
  - Deepwater
  - Remote locations
Industry Perspective

MULTIPLE INDUSTRY RESPONSES ARE PROGRESSING

Projects implemented following the report from the OGP’s Global Industry Response Group (GIRG):

- Well Design
- Well control
- Intervention
  - Capping
  - Containment
- Oil spill response
  - API Joint Industry Task Force (JITF)
  - OGP Joint Industry Project (JIP)
  - OGP Arctic Joint Industry Project

Governments, regulators, NOIAs, OSROs and industry initiatives
Industry Perspective

EMERGING SOLUTIONS

➤ Equipment to support intervention
  ▪ Capping Stacks, Containment toolkits
  ▪ Subsea dispersant toolkits

➤ Consistent oil spill response strategies
  ▪ ‘Big and quick’ response
  ▪ Maximise encounter rate
  ▪ Approval and use of multiple tools
    ▪ Aerial and subsea dispersant, mechanical recovery, fire boom
    ▪ Supported by NEBA
    ▪ Utilisation of maturing technologies
Industry Perspective

EXPECTATIONS OF OIL SPILL RESPONSE ORGANISATIONS (OSRO’s)

➢ Directionally, grow capability
  ▪ Share and adopt best practices
  ▪ Mutual aid, alliances, technical partnerships
    ▪ Global Response Network
    ▪ CCA/OSRL Merger
    ▪ AMOSC Alliance

➢ Collaboration, Convergence, Consistency
  ▪ Improved global access to people and equipment
Industry Perspective

SPECIFICALLY, FOR OSRL

- Increase number of well trained responders
- Respond to industry demands
  - Projects, training, consultancy
- Enhance response expertise and breadth of capabilities
  - Jet platform, surveillance, SCAT modelling, recovery systems, fire boom, Subsea response, ICS
- Own, store and maintain subsea well dispersant, capping and containment toolkits
- Improve Arctic response
- Improve Wildlife response
OSRL - key initiatives
OSRL Perspective

People are Key

➢ 315 dedicated employees
➢ More specialists:
  ▪ ICS, Logistics, Modelling, SCAT, SMART, Surveillance.
➢ Enhanced training programs:
  ▪ Cold Weather, Wildlife, NEBOSH
➢ Improved initial training:
  ▪ Redesigned “Spill Responders Course” in 2014.
➢ Improved online ACMS:
  ▪ Better tracking, accreditation and skills monitoring.
## Spill Responders Course

### OSRL Spill Responder Course 10 Feb – 16 May 2014

| Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 | Week 13 | Week 14 | Week 15 | Week 16 | Week 17 | Week 18 | Week 19 | Week 20 | Week 21 | Week 22 | Week 23 | Week 24 | Week 25 | Week 26 | Week 27 | Week 28 | Week 29 | Week 30 | Week 31 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
Accredited Competency Management System

Step 6
- Technical Expert
  - Based on external recognition, by Governing bodies within area of expertise.

Step 5
- Technical Lead Level ACMS
  - Achieve Technical Lead and Level 2 of Subject Matter Expert

Step 4
- Technical Specialist Level ACMS
  - Achieve Technical Specialist Responder/Consultant/Trainer (Level 1 of Subject Matter Expert achieved)

Step 3
- Senior Level ACMS
  - Achieve Senior Responder/Consultant/Trainer - 2 to 3 years to complete.

Step 2
- Specialist Level ACMS
  - Achieve Specialist within 12 months of finishing Initial Training.

Step 1
- Complete Spill Responder Training Course
  - Achieve Spill Responder
OSRL Perspective

People are Key

➢ The new technologies require better trained and experienced people to ensure they can be successfully deployed.

➢ Headcount for SWIS and the new bases will soon reach 50 people, delivering significant logistics and Subsea expertise.

➢ 160+ trained responders.

➢ Our people continue to be hired by industry and other key stakeholders. A win-win.

➢ We have a diverse multi-skilled global team with a good demographic mix.
OSRL Perspective

A step change in Preparedness

- Increasing regulatory scrutiny
- Consultancy delivering
  - Training
  - Modelling
  - Oil Spill Contingency Plans - OSCP’s
  - Environmental sensitivity mapping
  - Wildlife preparedness
  - Contingency planning
  - Capability reviews
  - Equipment packages
- Demonstrating effective response
  - Train, Train, Train
  - Exercise, Exercise, Exercise
  - Lessons Learned then...
  - Train, Train, Train
# Modelling - Pre & Post Macondo

<table>
<thead>
<tr>
<th>PREPAREDNESS</th>
<th>PRIOR TO MACONDO</th>
<th>POST MACONDO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2D modelling focusing on oil on the surface</td>
<td>3D modelling focusing on oil through the water column as well as on the surface</td>
</tr>
<tr>
<td></td>
<td>Generalists – Modelling completed by staff who do many activities as well as modelling</td>
<td>Specialists – Specialist staff employed to focus solely on oil spill modelling</td>
</tr>
<tr>
<td></td>
<td>Modelling run using off-the-shelf laptops</td>
<td>Dedicated powerful modelling servers</td>
</tr>
<tr>
<td></td>
<td>Metocean Data Quality – Modelling undertaken using standard dataset</td>
<td>Metocean Data Quality – Each project assessed by OSRL’s metocean consultant and data is sourced specifically for the project.</td>
</tr>
<tr>
<td></td>
<td>Simple and basic illustrations</td>
<td>Enhanced data analysis and presentations using specialist tools</td>
</tr>
<tr>
<td></td>
<td>Standard client requirements, very little variation on the type and style of the modelling.</td>
<td>Continuously evolving client requirements which are becoming increasing complex.</td>
</tr>
</tbody>
</table>
## Modelling - Pre & Post Macondo

<table>
<thead>
<tr>
<th>RESPONSE</th>
<th>PRIOR TO MACONDO</th>
<th>POST MACONDO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2D modelling</td>
<td>2D and 3D modelling</td>
</tr>
<tr>
<td></td>
<td>No need for dedicated specialists</td>
<td>Modelling specialists specifically requested as part of the response</td>
</tr>
<tr>
<td></td>
<td>Regulators and Operators generally happy with 2D models</td>
<td>Regulators and Operators expect 3D modelling to be available</td>
</tr>
<tr>
<td></td>
<td>Basic Metocean data are acceptable as input to the models</td>
<td>Increasing demand for high quality metocean data specifically created for the spill</td>
</tr>
</tbody>
</table>
Oil Spill Contingency Plans - Post Macondo

➢ UK specific
  ▪ Working Groups and Joint Industry Programmes established
  ▪ Update to National Oil Spill Contingency Plan and regulations

➢ Globally
  ▪ Updates to OGP-IPIECA good practice guides (GPG’s)
  ▪ Global initiatives and working groups to review international standards for contingency planning

➢ OSRL
  ▪ Expansion and emphasis to OSCP template
  ▪ Review process more stringent (quality and technical)
  ▪ Worst case scenario planning
Oiled Wildlife Response (OWR)

- 8 year partnership with Sea Alarm Foundation providing international OWR to members
- Tier 3 OWR network is being built with ten leading wildlife response organisations supported by the JIP and OSRL
- OSRL Technical Advisor role to include OWR advice prior to expert support arriving on scene
- OWR is being incorporated into ACMS
- OWR kits at 4 locations for use by external expertise
- Joint Industry Project (JIP) developing a Good Practice Guide for OWR
Shoreline Clean up Assessment Tool (SCAT)

- Systematic survey and documentation of oiled shorelines for ICS Planning Section
- Outputs used to make informed decisions on appropriate shoreline response techniques
- Internal training courses developed and integrated into ACMS
- SCAT Field Guides, Forms and Standard Operating Procedure being developed
- External 3 day training courses in USA, EMEA and APAC in 2014 and at IOSC (May 2014)
OSRL Perspective

Paradigm shift in Response

➢ Faster response
  ▪ Air transportability is key
  ▪ Enhanced Tier 2 capabilities when logistic challenges exist
  ▪ Regulatory driven response timelines (UKCS)

➢ Longer and more frequent standby mobilisations
  ▪ Just in case
  ▪ This dictates the need for more trained resources

➢ Broader response capability
  ▪ Surface and Subsea combined

➢ More of everything
  ▪ Build on recommendations from JIP, JITF, OGP and others
OSRL Perspective

New and Improved Response Solutions

- Subsea Well Intervention Services
  - Capping Stacks
  - Subsea Dispersant Toolkits
  - Containment systems
  - Global Dispersant Stockpile
  - Offset Capability (R&D stage)

- Enhanced Aviation Assets
  - Boeing 727 Dispersant A/C
  - Dornier 228 Surveillance A/C
  - Islander first strike Dispersant A/C

- Mechanical Recovery
  - New boom configurations

- In Situ Burning
  - Improved ignition systems
Subsea Well Intervention Service (SWIS) Update
International delivery & storage

4 x capping stack toolboxes
(2 x 10k / 2 x 15k)
Delivery January – December 2013

2 x subsea dispersant hardware toolboxes
Delivered December 2012
Relocate 1 set to Brazil Q4 2013

Rio de Janeiro, Brazil
Stavanger, Norway
Aberdeen, UK
Saldanha, South Africa
Singapore
Training

- **External**
  - Members Interface session held in Norway, Singapore, South Africa and Houston
  - Members Cap on Well Workshop held in Southampton and Houston
  - Member Company deployed Norway based Subsea Dispersant Toolkit in 1000m water depth in Angola
  - Online training package + ROV simulator

- **Internal**
  - Carried out extensive training with Operation’s Duty Teams
  - Undertaken tabletop exercises at all bases
  - Equipment mobilised to the quayside at three locations
Training

- ROV SIMULATOR:
  - Enables practice of subsea deployment activities in a virtual environment.
Two key components of …
Subsea Well Containment Solution

Know how ...
Subsea Well Containment Guidelines (SWCGs)

Equipment ...
Containment Toolkit

- Assist operator to include containment scenario in a well contingency plan
- If capping is unsuccessful, guides operator in a stepwise approach to prepare for deploying and operating a containment system
Timeline

Next steps

Now
OSRL capping and containment subscriptions are open
Capping, dispersant, debris clearance and BOP intervention equipment ready for use

End 2013
Containment guidelines completed

End 2014
First containment toolkit equipment ready for use

2015
Containment equipment stored at international locations

2013

2013 – 14
Delivery of containment toolkit
OIS studies continuing

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# Global Dispersant Stockpile – 5000 m³

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity (m³)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dasic Slickgone NS</td>
<td>500</td>
<td>OSRL Base UK Southampton</td>
</tr>
<tr>
<td>Finasol 52</td>
<td>500</td>
<td>OSRL Base UK Southampton</td>
</tr>
<tr>
<td>Finasol 52</td>
<td>700</td>
<td>OSRL Base Singapore</td>
</tr>
<tr>
<td>Finasol 52</td>
<td>1500</td>
<td>Supplier Warehouse - Europe</td>
</tr>
<tr>
<td>Finasol 52</td>
<td>800</td>
<td>South Africa</td>
</tr>
<tr>
<td>Corexit EC9500A</td>
<td>500</td>
<td>Florida/Texas USA</td>
</tr>
<tr>
<td>Corexit EC9500A</td>
<td>500</td>
<td>Brazil</td>
</tr>
</tbody>
</table>
### Offset Installation System (OIS)

**R&D Project**

If approved to proceed delivery and testing in first half of 2015

<table>
<thead>
<tr>
<th>Activity</th>
<th>2014</th>
<th>Q1 2015</th>
<th>Q2 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed Design, Procurement, Fabrication</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Integration and Onshore SIT</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Offshore SIT (OIS Function testing)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Time to remediate/repair (if needed)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Commissioning Test (OIS operations)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>
Boeing 727 final flight test
Boeing 727 update

- First Boeing 727 available in next few weeks
- 4 hours notice – 17.5 tonnes of dispersant
- Second Boeing 727 available by mid-2014
- 48 hours notice – 25 tonnes of Cargo + dispersant capability as for first aircraft
- Range 2500 nm in approximately 5 hours
- Both aircraft to be based at Doncaster Airport in the UK
- Operated by T2 Aviation
# Summary of Current / Near Future Capabilities

<table>
<thead>
<tr>
<th>Service</th>
<th>Global</th>
<th></th>
<th></th>
<th>Regional</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dispersant</strong></td>
<td>Aircraft</td>
<td>Location</td>
<td>Capability</td>
<td>Aircraft</td>
</tr>
<tr>
<td></td>
<td>L-382G Hercules</td>
<td>EMEA</td>
<td>17.5m³</td>
<td>Bandeirante (WACAF)</td>
</tr>
<tr>
<td></td>
<td>C-130 Hercules</td>
<td>AsiaPac</td>
<td>15.3 m³</td>
<td>Islander (UKCS)</td>
</tr>
<tr>
<td></td>
<td>B727 (x2)</td>
<td>EMEA</td>
<td>17.5m³</td>
<td></td>
</tr>
<tr>
<td><strong>Surveillance</strong></td>
<td>None</td>
<td></td>
<td></td>
<td>Bandeirante (WACAF)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Islander (UKCS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dornier 228 (UKCS)</td>
</tr>
<tr>
<td><strong>Logistics</strong></td>
<td>B727 (x2)</td>
<td>EMEA</td>
<td>25 tonnes</td>
<td>Bandeirante (WACAF)</td>
</tr>
<tr>
<td></td>
<td>L-382G Hercules</td>
<td>EMEA</td>
<td>21 tonnes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C-130 Hercules</td>
<td>AsiaPac</td>
<td>21 tonnes</td>
<td></td>
</tr>
</tbody>
</table>

Chapman & Freeborn (Aircraft broker)
Peters & May / Hellmans / others (freight forwarders)
OSRL Perspective

Responding in new frontiers

▶ Arctic
  - Cold weather capability
  - Logistic challenges
  - Enhanced surveillance capability will be needed
  - Fog, darkness and Ice challenges

▶ Increased deepwater activity
  - SWIS capping members have plans for 500 wells in 2013/14

▶ Long range planning
  - Significant lead times to assemble required resources

▶ Tier 1 & 2 needs emerging

▶ Global response capability
Main areas of interest

- Beaufort Sea
- Baffin Bay
- Kara Sea
- Barents Sea
Current Competence Summary

- **Level 1: Arctic Responder (under development)**
  - Strong foundation of knowledge and understanding
  - Minimum of knowledge and understanding achieved through in-house training and assessment

- **Level 2: Arctic Advisor (x 22 personnel)**
  - Trained ‘competent’ personnel with actual experience
  - Minimum of on-ice practical training

- **Level 3: Arctic Lead (x 7 personnel)**
  - Trainers or Technical Advisors
  - Minimum of on-ice training, and spill or secondment experience
## Current Equipment Status

<table>
<thead>
<tr>
<th>Category</th>
<th>% of Global Stockpile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Can be used</td>
<td>41</td>
</tr>
<tr>
<td>2  Can be used with slight modifications</td>
<td>31</td>
</tr>
<tr>
<td>3  Can be used with significant modifications</td>
<td>5</td>
</tr>
<tr>
<td>4  Not suitable</td>
<td>8</td>
</tr>
<tr>
<td>5  Further investigation required</td>
<td>15</td>
</tr>
</tbody>
</table>
# 2014 and beyond - Action Plan

<table>
<thead>
<tr>
<th>Capacity building</th>
<th>Addressing the gaps identified:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Training and development of staff</td>
</tr>
<tr>
<td></td>
<td>2. Purchase / conversion of equipment</td>
</tr>
<tr>
<td></td>
<td>3. Strengthening logistics processes</td>
</tr>
<tr>
<td></td>
<td>4. Development of third party networks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capability Assurance</th>
<th>Ongoing confidence check on our Arctic capability through:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Auditing against approved standards</td>
</tr>
<tr>
<td></td>
<td>2. Testing through drills</td>
</tr>
<tr>
<td></td>
<td>3. Skills maintenance programme / staff exchanges / etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credibility building</th>
<th>Demonstration of capability through:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. External engagement</td>
</tr>
<tr>
<td></td>
<td>2. Conference</td>
</tr>
<tr>
<td></td>
<td>3. Drill performance</td>
</tr>
<tr>
<td></td>
<td>4. Spill Response</td>
</tr>
</tbody>
</table>
Managing a Response
OSRL Perspective

Managing a complex incident

A subsea incident in a new frontier area
- Mutual Aid
- Multiple agencies
- Crossing international borders
- Massive logistic challenges for both people, equipment and materials (e.g. dispersants)

Incident Command System (ICS)
- Increased internal and external training
- Additional experienced resources have been hired
Since 2011 we have been using ICS as our primary management tool in our internal systems and response processes during mobilisation.

This enables us to integrate with the different types of response management systems being used by industry globally.

The following diagram shows how our expertise can be utilised in all aspects of an oil spill.
ICS during a Response

OSRL BASE SUPPORT

EOC COMMAND DUTY MANAGER

SAFETY

PLANNING

LOGISTICS

FINANCE / ADMIN

LOGISTICS SERVICE BRANCH

LOGISTICS SUPPORT BRANCH

COMMUNICATION AND REPORTING

RESPONSIBLE PARTY

OSRL SPILL RESPONSE MANAGER

SAFETY / INFORMATION / LIAISON

OPERATIONS

PLANNING

LOGISTICS

FINANCE / ADMIN

DISPERSANT MONITORING

SCAT TECHNICAL SPECIALISTS

LOGISTICS SERVICE BRANCH

AERIAL DISPERSANT

WILDLIFE TECHNICAL SPECIALISTS

LOGISTICS SUPPORT BRANCH

SHORELINE & OFFSHORE OPS

WASTE MANAGEMENT

IN-FIELD MANAGEMENT
The Global Response Network

Operational Teams

- Offshore: MSRC
- Shallow Water/Onshore: ECRC
- Dispersant: OSRL
- In-situ Burning: MSRC
- Remote Sensing: NOFO
- Ice-covered Waters: ACS
- Response Management: WCRC

GRN Member

External Engagement
Mutual Aid

Mutual aid in large-scale offshore incidents – a framework for the offshore oil and gas industry
Closing Comments

- Industry has and continues to invest significant resources to improve its ability to effectively respond to oil spill incidents across the globe.
- It is critical that we all embrace these developments to ensure they are implemented.
- During this Symposium, I ask each of you to find more innovative ways to help make this happen.

Thank you for attention
Robert Limb
Chief Executive and Director
Oil Spill Response Limited
1 Great Cumberland Place
London W1H 7AL
United Kingdom

robertlimb@oilsplillresponse.com