



Content Overview

- About OSRL
- Risk-Based Permitting
- Preparedness and Response
- Questions



About OSRL

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Who we are



- » Largest international industry funded cooperative
- » Owned by over 40 oil and gas production companies
- » Train and respond effectively anywhere in the world where the world's major oil and gas producers operate

Membership

Participant Members



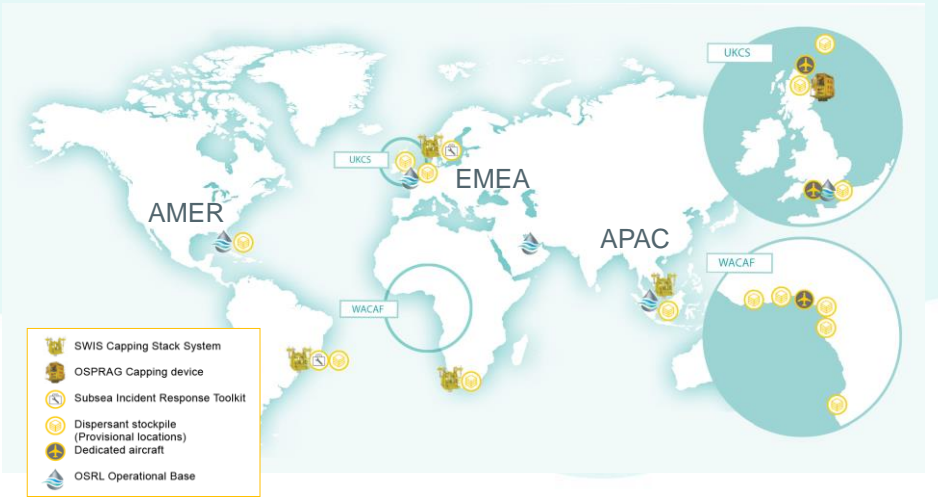
44 Participant Members
and over 100 Associate Members

Membership

Associate Members

- | | | |
|---|---|---|
| » Airen plc | » GDF Suez SA | » Petrofac Malaysia PM-304 Ltd |
| » AMN International Petroleum Development Company Limited | » Gibraltar Port Authority | » Petrofac Mexico |
| » Angola LNG Limited | » Glencore Exploration Cameroon | » Petrojam |
| » Baffinland Iron Mines Corp | » Great Lakes Dredge & Dock Company | » Petro Masila |
| » Bailiwick of Guernsey | » Guam Response Services Ltd | » Petrotrin |
| » Balize Natural Energy | » Gujarat State Petroleum Corp Ltd | » Philodrill Corporation |
| » Bergesen Worldwide | » HM Naval Base Portsmouth | » Premier O&G Services Limited |
| » BPC (A) Limited | » HRT Africa Petroleum S.A. | » Petroterminal de Panama |
| » BPZ E&P | » Hurricane Exploration plc | » RECOPE |
| » Bridge Energy Limited* | » Ithaca Energy (UK) Ltd | » REFIDOMSA |
| » Cairn India Ltd | » JX Nippon E&P UK Ltd | » Reliance Industries Ltd |
| » Cairn Energy plc | » Kosmos Energy LLC | » Rijkswaterstaat |
| » CE Tunisia | » Kebabangan Petroleum Operating Company Sdn Bhd (KPOC) | » Rubis Energy Jamaica Limited |
| » Centrica Resources Ltd | » La Campana de Electricidad de San Pedro (CEPSM) | » RWE Dea UK Holdings Ltd* |
| » CEPOL | » LukOil Sierra Leone | » RWE Norge |
| » Chrysaor Limited | » Lundin Services B.V. | » Salamander Energy |
| » CIE Angola Block 21, Ltd | » Melones Terminal | » Santos |
| » CNOC Congo | » Minister for the Marine & Natural Resources | » Savia Peru |
| » CNOC Uganda Limited | » Mitra Energy Limited | » Soco International plc |
| » Dana Petroleum (E&P) Ltd | » MODECO | » Sociedad de Salvamento y Seguridad Maritima |
| » DONG E&P A/S | » MPX North Sea Ltd | » Sol Caribbean |
| » Dragon Oil (Turkmenistan) Ltd | » Mubadala Petroleum (SE Asia) Limited | » Starc Limited |
| » E.on E&P UK Ltd | » New Age Africa Global Services | » STAATSOLIE |
| » Ecopetrol | » North Caspian Operating Company (NOC) B.V. | » Taq Taq Operating Company Ltd |
| » Edison SpA | » New Age (African Global Energy) Ltd. | » TAQA Bratani Ltd |
| » Endeavour Energy (UK) Ltd | » Newfield Peninsula Malaysia Inc | » Ternap |
| » EnQuest Britain Limited | » Nido Petroleum Philippines Pty Limited | » Totalenerg SpA |
| » Environmental Protection Agency | » Nigeria LNG | » Trinity Exploration & Production Services Limited |
| » EOG Resources United Kingdom Ltd | » Norwegian Energy Company ASA | » Turkiye Petrol Rafinerileri A.S. |
| » EOG Resources Trinidad Ltd | » Nustar Terminals Antilles | » Valco Energy, Inc |
| » Fairfield Energy plc | » OCEANSA | » Vermilion REP SAS |
| » First Oil | » OMV E&P GmbH | » Vivo Energy |
| » Foxrot International LDC | » Ophir Services | » West Indies Oil Company |
| » Galoc Production Company W.L.L | » Peru LNG S.R.L. | » Wintershall Holding GmbH |
| » Gassco, UK* | » Petro Celtic | » Woodside Energy Ltd |
| | | » Zhambyl LLP |

Our global capability



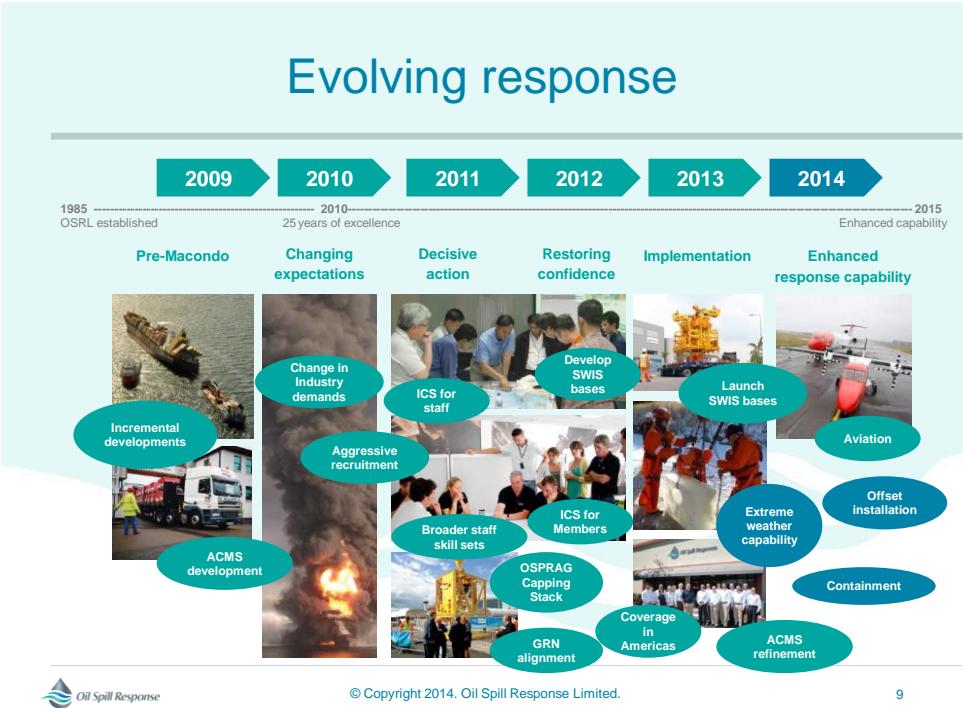
What we do

Preparedness

- » Training
- » Consultancy
- » Oil spill modelling
- » Capability reviews
- » Equipment hire
- » Exercises and drills

Response

- » Technical advice
- » Spill management
- » Specialist personnel
- » Equipment and transportation
- » Aerial dispersant and monitoring systems
- » Response integration

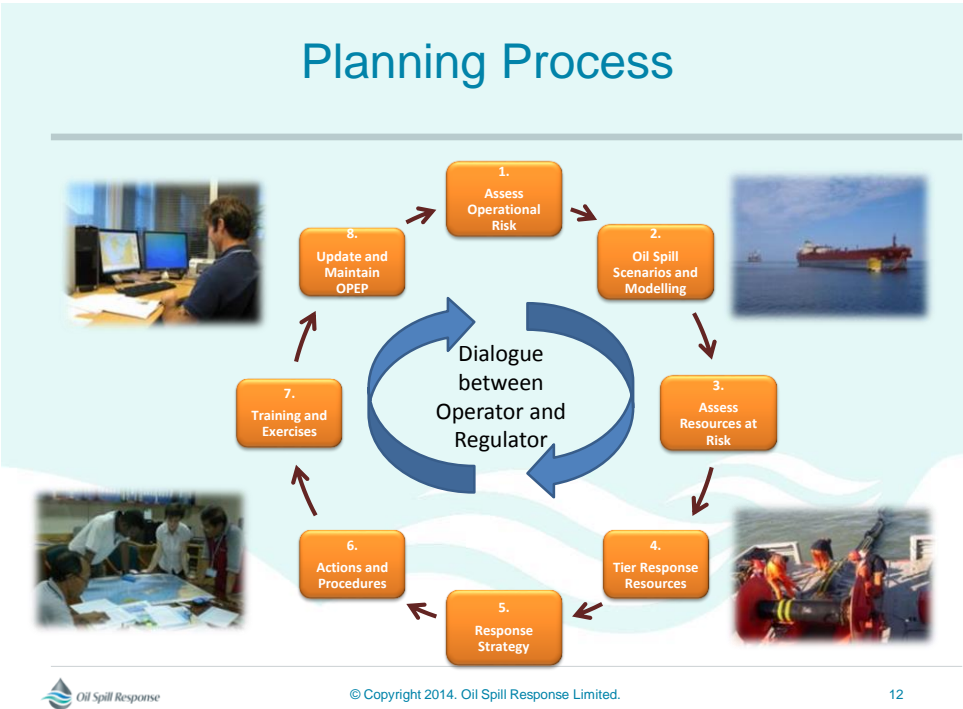
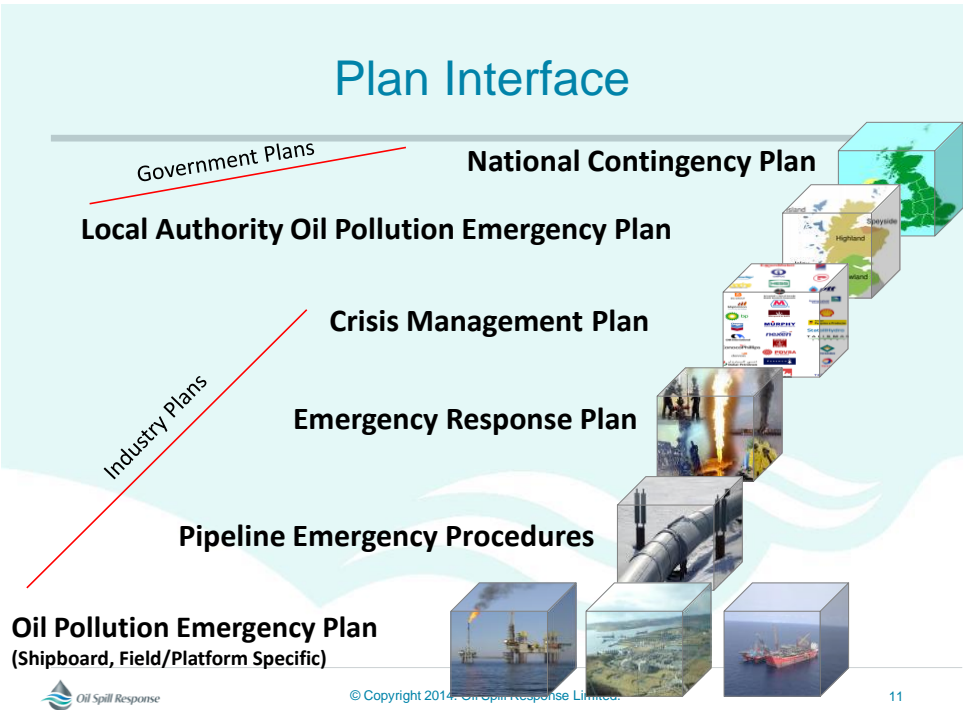




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Risk-Based Permitting

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Response Strategy - Planning

Monitor and Evaluate



Shoreline Protection and Clean-up



Dispersant



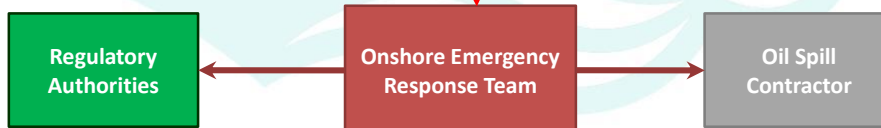
Source Control



Offshore Containment and Recovery



Actions and Procedures

[illegible]

Training

Course	Duration	Refresher
Offshore – On-scene Commander (OIM) – Level 1 <i>E-learning course</i>	4 hours	Repeat 3 yearly
Corporate Management – Level 2 <i>Generally held at Company premises</i>	4 hours	Repeat 3 yearly
Onshore Emergency Responder – Level 3 <i>Generally held at a central company location</i>	24 hours	1 day / 3 yearly
Onshore Emergency Responder – Level 4 <i>Held in OSRL premises due to practical deployments</i>	32 hours	1 day / 3 yearly



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Exercises

Type of Exercise	Frequency
Offshore OPEP	1 per shift per year
Onshore Emergency Response Centre installations and procedures associated with OPEP response	1 per year per Operator
Offshore deployment of Tier 1 dispersant spraying equipment	Monthly
Offshore deployment of Tier 1 oil recovery equipment	1 per year per installation
SOSREP - existing operator	3 Yearly
SOSREP - New Operator - production only	Within 12 months of OPEP approval, thereafter 3 yearly
National exercise - Industry deployment of Tier 2 / 3 oil response equipment	3 Yearly

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Preparedness and Response

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Preparedness services

HOW PREPARED
ARE YOU TO
HANDLE A
SPILL?

AN EFFECTIVE RESPONSE DEPENDS ON

COMPETENT PERSONNEL
WELL DEVELOPED PLANS
ADEQUATE RESOURCES
REGULAR EXERCISES

A tiered and integrated response strategy maximises response effectiveness.

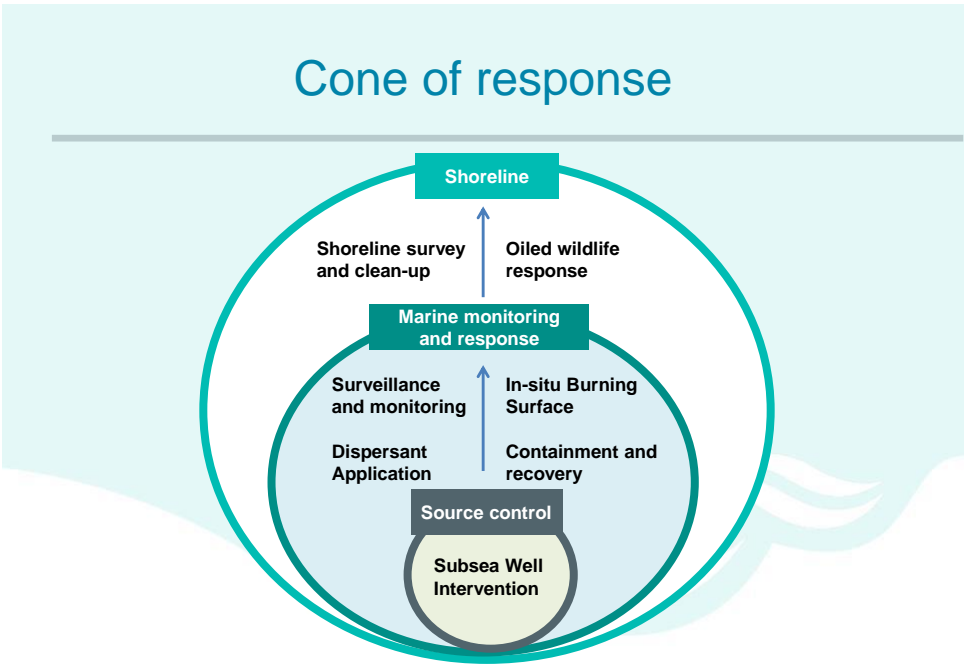
Contingency plans 	Capability reviews 	Training 	Secondments 	Equipment hire
<ul style="list-style-type: none">» Oil Spill» Modelling» Risk Assessment» Environmental Sensitivity» Wildlife	<ul style="list-style-type: none">» Equipment Management	<ul style="list-style-type: none">» Published courses» Client tailored	<ul style="list-style-type: none">» Long term or short term specialist support	<ul style="list-style-type: none">» Long and short term hire contracts» Integrated training and maintenance services



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Cone of response



Source control

Subsea Well Intervention

Capping

- » Capping Stack System includes capping stacks and subsea dispersant hardware
- » Industry can access equipment via a supplementary agreement
- » Equipment stored in Norway / Singapore / Brazil / South Africa

Subsea Incident Response Toolkit

Hardware kits include:

- » Tools for site surveys
- » Debris clearing equipment
- » Flying leads, distribution manifold and dispersant wands
- » High pressure, high volume accumulators

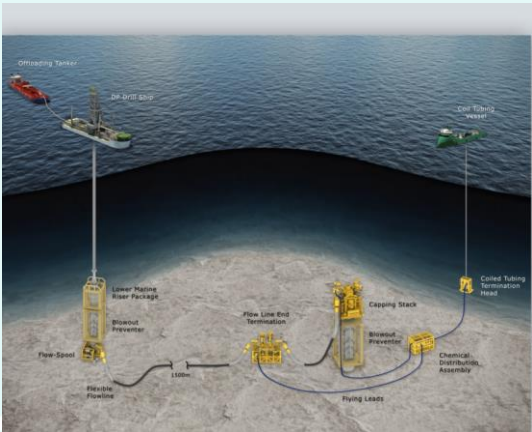


Source control

Containment

Generic Containment Toolkit

- Captures fluids from an incident well and flows them to the surface for processing and disposal.
- If well shut-in is not possible, the subsea well containment toolkit can be deployed to enable the flow of well hydrocarbons from the capping stack to an offloading tanker.
- The first toolkit will be available and ready for use by the end of 2014.



Marine monitoring and response

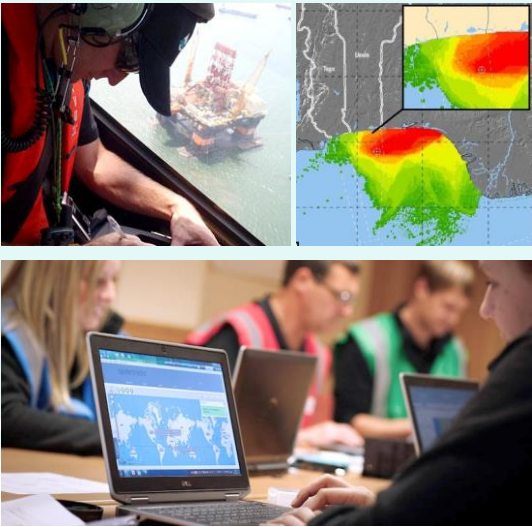
Surveillance and monitoring

Satellite, Aerial Services

- Global satellite imagery
- Aerial surveillance services

Modelling

Capability to run surface models and subsea (3D) models to track the movement of oil before wind driven currents act upon its trajectory.



Marine monitoring
and response

Dispersant application

Vessel mounted and
aerial platforms

- » Dedicated aircraft (Hercules, 727, Islander)
- » Experienced personnel for operation of aerial and vessel dispersant application

Analysis of dispersant
application

Determine the effectiveness and environmental impact of dispersant operations



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Marine monitoring
and response

Containment and
recovery

Surface containment
and recovery

- » Temporary storage equipment for recovered oil
- » Large range of recovery devices to suit the oil viscosity.
- » High-volume offshore recovery skimmers also available



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Marine monitoring and response

In situ burning

Surface containment using fire resistant boom

- » Controlled burning can be an extremely valuable response technique when responding to a significant oil release in open water
- » Need for concentrated oil and means of ignition
- » Monitoring equipment is used when carrying out in-situ burning for the real-time detection of airborne dust, fumes and particulates.



Shoreline

Shoreline survey and cleanup

Shoreline Clean-up Assessment Technique (SCAT)

- » Identify sensitive resources (either environmental, economic or cultural).
- » Evaluate shoreline oiling conditions.
- » Determine the need for shoreline clean-up and recommend clean-up methods and end points.
- » Apply the concept of Net Environmental Benefit

Onsite Cleanup

- » Protect sensitive shorelines (boom deployment)
- » Prepare site for cleaning to minimise the chance of secondary contamination
- » Clean up in progressive stages



Shoreline

Oiled wildlife response

Collaboration with the Sea Alarm Foundation

- » Integration of oiled wildlife response into oil spill planning
- » Wildlife response management and planning as part of ICS
- » OSRL provides initial setup of a wildlife rehabilitation centre with specialised equipment
- » Support of trained personnel to handle wildlife facilitated by the Sea Alarm Foundation



Questions