



*Oil Spill Response*



# EQUIPMENT LIST

We have categorised our response capability in alignment with the industry's Tiered Preparedness and Response (TPR) wheel approach, which better reflects the true value of what OSRL can offer.

## Access our capabilities, not just our equipment

Instead of equipment types, **we have categorised our response capability in alignment with the industry's Tiered Preparedness and Response (TPR) wheel approach**, which better reflects the true value of what OSRL can offer.

Over the last two years, OSRL conducted a comprehensive study of the SLA equipment stockpile, analysing its age, maintenance, storage and usage to develop a life cycle management program.

In conjunction, an equipment capability study was conducted based on the three worst credible case scenarios, of which two concurrent scenarios were used for planning purposes.

Actions were then taken to close any identified shortfalls with replacement equipment. This also provided an opportunity to select new equipment, which offers increased operational efficiency by:

- Replacing aged unimodal skimmers with multi-functional – brush/disc type and weir/brush type
- Replacing aged passive boom systems with high-speed and active boom systems for various offshore scenarios
- Obtaining higher performance oil pumps for persistent oil
- Improving air monitoring and benzene detection

To respond in the most efficient way, we have pre-packaged some of the equipment into loads that are suitable for most spills and operational environments.

An effective response depends on a structured or tiered escalation of response capability (equipment, trained responders and enabling logistics), using a toolbox approach to response techniques.

Net Environmental Benefit Analysis (NEBA) and Spill Impact Mitigation Assessment (SIMA) are used as a planning and a response technique selection process to ensure that the most appropriate techniques are utilised and that affected stakeholders are fully engaged in a science-based approach to determine the overall response strategy. Response advocacy, based on experience and good practice may be needed to help overcome barriers that restrict or prevent the best technical approaches from being followed.

**A Service Level Agreement (SLA) Global Report is available for download in PDF from:**  
**[www.oilspillresponse.com/activate-us/equipment-stockpile-status-report](http://www.oilspillresponse.com/activate-us/equipment-stockpile-status-report)**

**Our capability is structured to integrate with your response system to achieve these key deliverables.**

# TABLE OF CONTENTS

|  |    |   |    |
|--|----|---|----|
| <b>Offshore surface dispersant</b><br>Boat spray // Boat spray nozzles with spray system // Helicopter dispersant // Neatsweep system  | 4  | <b>Waste management</b><br>Offshore temporary storage barge // Storage skid tank // Offshore temporary storage bladder // Portable temporary storage  | 16 |
| <b>Aviation capability</b><br>Boeing 727 // Hercules C-130A // Piper PA-31 Navajo // Cessna 337G Skymaster // The TERSUS System // RIDSS   | 5  | <b>Oiled wildlife response</b><br>Search and capture // Medical // Cleaning and rehabilitation  | 17 |
| <b>Dispersant stockpile</b><br>Service Level Agreement // Global Dispersant Stockpile // United Kingdom Dispersant Stockpile   | 6  | <b>Vehicles &amp; vessels</b><br>6x6 vehicle // 4x4 vehicle // Inflatable boat with outboard motor // Rigid hull inflatable boat // Landing craft // Dedicated oil spill response vessel  | 18 |
| <b>Surveillance and modelling</b><br>UAVs // Oil spill tracking buoy // C3 fluorometer // Satellite imagery // 3D and 2D oil spill modelling   | 9  | <b>Site safety, clean-up and ancillary equipment</b><br>Hydraulic pressure washer // Benzene detector // Submersible transfer pump // Portable lighting set // Heavy oil transfer pump // Transfer pump // Hydraulic power pack   | 19 |
| <b>At-sea containment and recovery</b><br>High-speed system - current buster 6 // Offshore containment boom // High-speed system - oil trawl with Boom Vane for single vessel deployment // Interchangeable tooth disc and brush skimmer // Brush belt skimmer // Belt skimmer // High volume recovery brush skimmer | 10 | <b>Command equipment</b><br>VHF repeater station // VHF base station // Command pallet // Telescopic mast // Portable BGAN voice and data terminal  | 20 |
| <b>In-situ controlled burning</b><br>Hydro-fire boom // Fire boom // Particulate air monitor   | 12 | <b>Pre-packaged loads</b><br>High Volume Recovery Systems (Offshore) // High Volume Offshore Recovery Systems (Containment And Recovery) // Fast Response Trailers // Shoreline Package Standard // Shoreline Package Standard Supplement // Shoreline Package Heavy Oil Supplement | 21 |
| <b>Inland response</b><br>Cascade deflection booming // Karibeners, rigging plates and ascenders // Combination of methods   | 13 | <b>Subsea Well Intervention Services (SWIS)</b><br>Capping Stack System & Subsea Incident Response Toolkit // Water Column Monitoring Equipment // OSPRAG Capping Device – UKCS // Containment Toolkit // Offset Installation Equipment   | 22 |
| <b>Shoreline clean-up/protection of sensitive resources</b><br>Inflatable air skirt and shore sealing boom // Solid floatation boom // Fence boom // Interchangeable brush and disc skimmer // Tooth disc skimmer // Vacuum recovery skimmer // Oleophilic rope mop skimmer // Drum skimmer                          | 14 |   |    |

# OFFSHORE SURFACE DISPERSANT

## Application

OSRL holds a variety of dispersant application systems. Our integrated wide area aerial dispersant systems contribute to this key capability via TERSUS for our Boeing 727 and RIDSS for our Hercules C-130A.

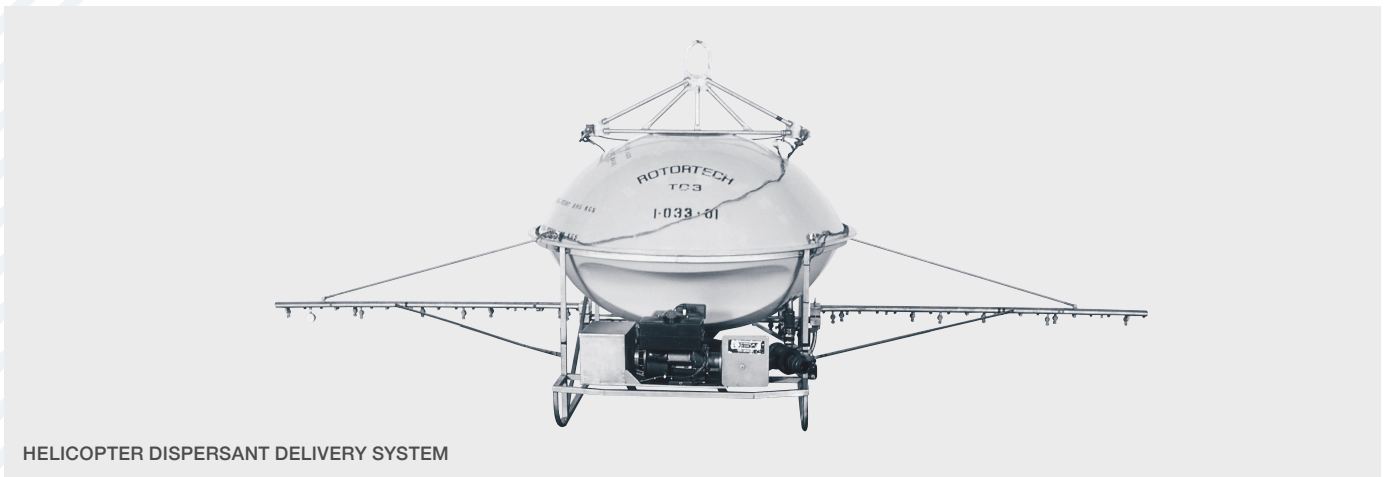
We also offer vessel deployed NeatSweep Systems that provide large encounter rates utilising a pair of sweeping

booms that funnel oil into a concentrated layer, where neat dispersant is efficiently applied.

Other various boat-mounted systems are available to directly treat oil slicks independently or to supplement aerial application through targeted spot treatment.



BOAT SPRAY SYSTEMS



HELICOPTER DISPERSANT DELIVERY SYSTEM



BOAT SPRAY NOZZLES WITH SPRAY SYSTEM



NEATSWEEP SYSTEM

# AVIATION CAPABILITY

Locations of aircraft are updated on [www.oilspillresponse.com](http://www.oilspillresponse.com)

## BOEING 727

Provides wide area dispersant application

**Location:** Doncaster, UK

**Range:** 2,500 nautical miles in 5 hours

**Dispersant capacity:** 15,000 litres



## HERCULES C-130A

Provides wide area dispersant application

**Location:** Malaysia

**Mobilisation time:** 6 hours

**Range:** 2,080 nautical miles in 8 hours

**Dispersant capacity:** 12,000 litres



## PIPER PA-31 NAVAJO

Provides aerial surveillance service

**Location:** Doncaster, UK

**Mobilisation time:** 60 minutes  
(within daylight hours)

**System capability:** OFIL Turret fitted with DSLR camera, HD video camera, laser range finder, ultraviolet and infrared sensors



## CESSNA 337G SKYMASTER

Provides aerial surveillance service

**Location:** Libreville, Ghana

**Location:** Lome, Togo

**Mobilisation time:** 4 hours



## The TERSUS system

The TERSUS system is the world's first jet based aerial dispersant system and was developed by OSRL and 2Excel Aviation. The system was designed under the latest and more stringent regulatory requirements. It consists of 7 double skinned tanks, a pump module, service pallet, compressed air reservoir, and venting system.

The system is controlled and operated by the flight crew from within the cockpit. It also has a calibrated flow meter linked to a logging system to track dispersant application.

The Tersus system is compatible with nine types of dispersants, with a capacity of 15,000 litres and a variable flow rate of between 500 to 1,200 litres per minute.

The dispersant is applied at an altitude of 150 feet and speed of 150 knots.



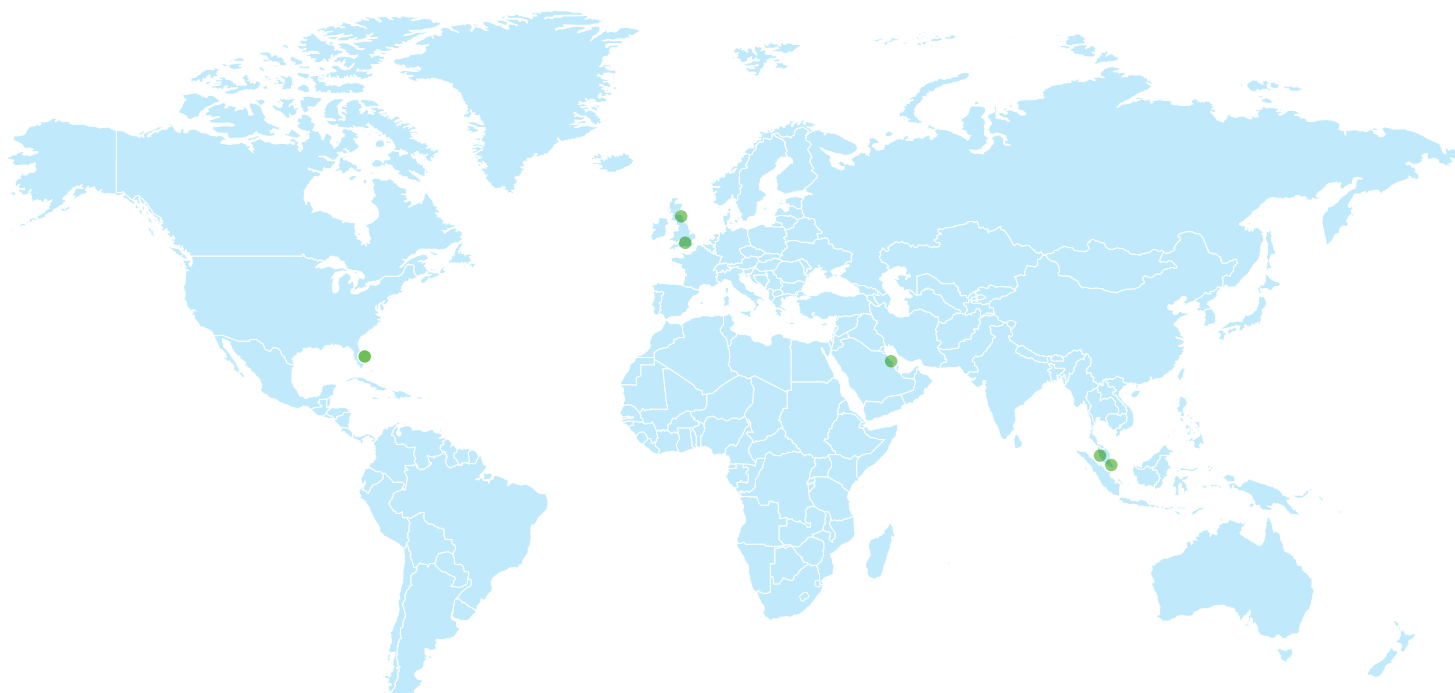
## RIDSS

The Rapid Installation and Deployment Spray System (RIDSS) allows multiple types of dispersants to be applied in precise patterns, at variable dosage rates, which can be adjusted throughout the mission. It also enables the aircraft to remain pressurised (with the rear cargo ramp closed) during dispersant operations. This system is installed in our C-130 aircraft from International Air Response.

We also hold the Airborne Dispersant Delivery System (ADDS) Pack which is used for dispersant spraying where a high treatment rate is required. Our ADDS packs are held in a reserve readiness state as potential support to the Boeing 727 and Hercules C-130A spray capabilities.

# DISPERSANT STOCKPILE

## Service Level Agreement (SLA) Dispersant Stockpile



### Specifications and locations

The Service Level Agreement (SLA) dispersant stockpile is readily accessible, easily mobilised and strategically located at our regional bases, along with our dispersant aircraft for rapid deployment. The dispersant types chosen are those with the widest worldwide approvals. All Members have access to these stockpiles.

Members may access 50% of the SLA dispersant stockpile. Access to more than 50% will be considered on a case-by-case basis and subject to the resupply of dispersant stocks.

| TYPE                      | QUANTITY (M <sup>3</sup> /US GAL*) | LOCATION                         |
|---------------------------|------------------------------------|----------------------------------|
| <b>Dasic Slickgone NS</b> | 222 /58,830                        | Southampton, UK                  |
|                           | 18 /4,770                          | Doncaster, UK (for 727 aircraft) |
|                           | 66 /17,490                         | Singapore                        |
|                           | 24 /6,360                          | Malaysia (for C-130 aircraft)    |
|                           | 26 /6,890                          | Bahrain                          |
| <b>Slickgone EW</b>       | 68 /18,020                         | Southampton, UK                  |
| <b>Slickgone LTSW</b>     | 2 /530                             | Southampton, UK                  |
|                           | 19 /5,035                          | Singapore                        |
| <b>Corexit EC9527</b>     | 84 /22,260                         | Singapore                        |
| <b>Corexit EC9500A</b>    | 32 /8,480                          | Southampton, UK                  |
|                           | 34 /9,010                          | Singapore                        |
|                           | 115 /30,475                        | Fort Lauderdale, USA             |
| <b>Finasol OSR 52</b>     | 22 /5,830                          | Southampton, UK                  |
|                           | 24 /6,360                          | Singapore                        |
|                           | 12 /3,180                          | Malaysia (for C-130 aircraft)    |
|                           | 9 /2,385                           | Bahrain                          |
| <b>Finasol OSR 51</b>     | 2 /530                             | Southampton, UK                  |

\*Quantities at each location are provisional figures only and may be subject to change.

## Global Dispersant Stockpile

Global Dispersant Stockpile (GDS) is a readily accessible and easily mobilised global stockpile of dispersant for industry use. The dispersants chosen are those with the widest worldwide approvals. Subscription to GDS provides critical, immediate access to substantial amounts of dispersant enabling application to be conducted at the site of the well incident, providing a safe area for the capping device deployment.

The stockpile is large enough to provide for serious incidents and it is stored globally across multiple locations, to meet a faster response to the regions. There are freight retainer arrangements at the locations to guarantee response.

In the event of a subsea incident, the stockpile will be able to supply a minimum of 30 days of dispersant (dependent on application and environmental conditions) response application using the total supplies from various locations. This 30-day leeway will cover a significant portion of time, which allows dispersant suppliers to ramp up their production, as well as alternative global sources to be identified. This approach offers a cost-effective solution for long duration incidents.

The stockpile can be used independently for any incident, whether subsea or on the marine surface. This stockpile can also be used with the Subsea Incident Response Toolkit (SIRT).

Members may gain access to the GDS stockpile via a long or short-term supplementary agreement. Annual subscription fees apply to both terms, to support the ongoing infrastructure, maintenance, logistics and readiness exercises – ensuring the dispersant is response ready.

### Approvals

The dispersant types chosen for the stockpile cover the widest range of global approval.

Many countries do not have a set dispersant approval regime, but in an emergency, OSRL will assist the GDS Member seeking regional approval for use.



### Specifications and locations

| TYPE                      | QUANTITY (M <sup>3</sup> /US GAL*) | LOCATION                |
|---------------------------|------------------------------------|-------------------------|
| <b>Dasic Slickgone NS</b> | 500 /132,500                       | Southampton, UK         |
|                           | 350 /92,750                        | Singapore               |
| <b>Finasol OSR 52</b>     | 500 /132,500                       | Southampton, UK         |
|                           | 350 /92,500                        | Singapore               |
|                           | 1500 /397,500                      | Vatry, France           |
| <b>Corexit EC9500A</b>    | 800 /212,000                       | Cape Town, South Africa |
|                           | 500 /132,500                       | Fort Lauderdale, USA    |
|                           | 500 /132,500                       | Rio de Janeiro, Brazil  |

\*Quantities at each location are provisional figures only and may be subject to change.

### Mobilisation

| TASK/ACTION                | OSRL  | MEMBER  |
|----------------------------|---|---|
| <b>Prior to a response</b> | Storage and maintenance of stockpile  | Annual subscription fees paid by Members  |
| <b>On mobilisation</b>     | Loading of dispersant and ancillary equipment onto Members arranged transport at OSRL storage facility or to a local port or airport. | Arrange transport of dispersant (including insurance) from OSRL storage facility to final destination. Note, OSRL can arrange transport on the Member's behalf. |
| <b>During response</b>     | Provision of advice and assistance on request   | Responsible for engaging with local government with regards to dispersant use   |

### DISPERSANT COUNTRIES OF APPROVAL

| DISPERSANT                | COUNTRIES OF APPROVAL   |
|---------------------------|---|
| <b>Dasic Slickgone NS</b> | Australia, Benin, Cyprus, France, Greenland, India, Israel, Libya, Malaysia, New Zealand, Nigeria, Norway, Philippines, ROPME Countries (Bahrain, Kuwait, Oman, Saudi Arabia, United Arab Emirates, Iraq, Iran, Qatar), Singapore, Togo, United Kingdom   |
| <b>Finasol OSR 52</b>     | Angola, Australia, Benin, Brazil, Cameroon, Congo, Croatia, Cyprus, Egypt, France, India, Indonesia, Israel, Kazakhstan, Malaysia, Morocco, Nigeria, Norway, Philippines, Portugal, ROPME Countries (Bahrain, Kuwait, Oman, Spain, Saudi Arabia, United Arab Emirates, Iraq, Iran, Qatar), Singapore, Thailand, Togo, Uruguay, United Kingdom, United States of America |
| <b>Corexit EC9500A</b>    | Angola, Argentina, Benin, Brazil, Chile, France, Israel, Libya, New Zealand, ROPME Countries (Bahrain, Kuwait, Oman, Saudi Arabia, United Arab Emirates, Iraq, Iran, Qatar), Singapore, Trinidad, United States of America  |

Correct at time of print.



## United Kingdom Dispersant Stockpile

United Kingdom Dispersant Stockpile (UKDS) is a readily accessible and easily mobilised stockpile of dispersant for industry use within the UKCS. Dasic Slickgone NS is located at Inverness (200m<sup>3</sup>) and Scalloway Shetlands (300m<sup>3</sup>). Subscription to UKDS provides critical, immediate access to substantial amounts of dispersant, support and dispersant application equipment.

The stockpile is large enough to provide for a serious UKCS incident and strategically located to meet a fast response. There are freight retainer arrangements at the locations to guarantee response.

In the event of a large incident, the stockpiles will cover a significant length of time, which allows dispersant suppliers to ramp up their production, as well as alternative regional/global sources to be identified. This approach offers a cost-effective solution to the demand for continual supply for long duration incidents.

The stockpile can be used independently for any incident, whether subsea or on the marine surface.

This stockpile can also be used with the Subsea Incident Response Toolkit (SIRT).

Members may gain access to the UKDS stockpile via a long or short-term supplementary agreement. Subscription fees apply to both terms, to support the ongoing infrastructure, maintenance, logistics and readiness exercises – ensuring the dispersant is response-ready.

### Stockpile support equipment

Both the stockpiles include the following support equipment for use either at the warehouse or to be mobilised to the scene of the incident:

- TC3 helicopter slung dispersant application system
- Boat Spray 50 vessel application system
- Going away box, providing spillage mitigation, PPE, tools and a bulk transfer pump system
- 1000 litre spillage bin and IBC sump



### Specifications and locations

| TYPE               | QUANTITY (M <sup>3</sup> /US GAL*) | LOCATION                |
|--------------------|------------------------------------|-------------------------|
| Dasic Slickgone NS | 200                                | Inverness, UK           |
|                    | 300                                | Scalloway Shetlands, UK |

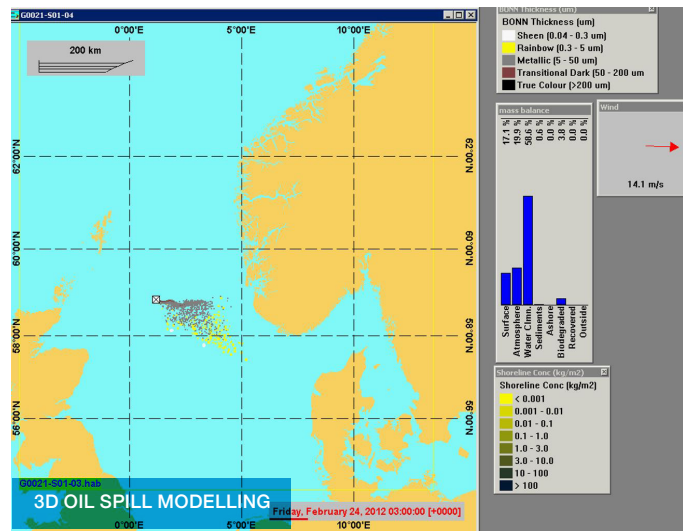
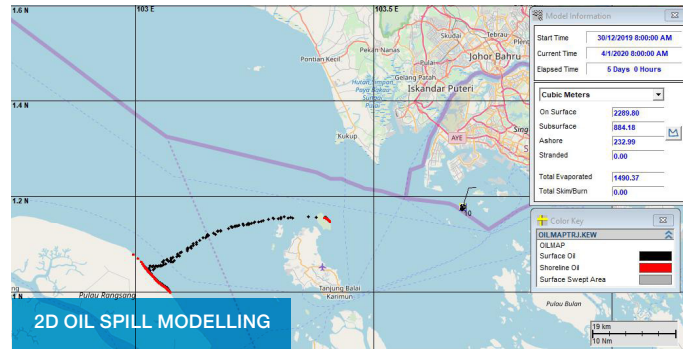
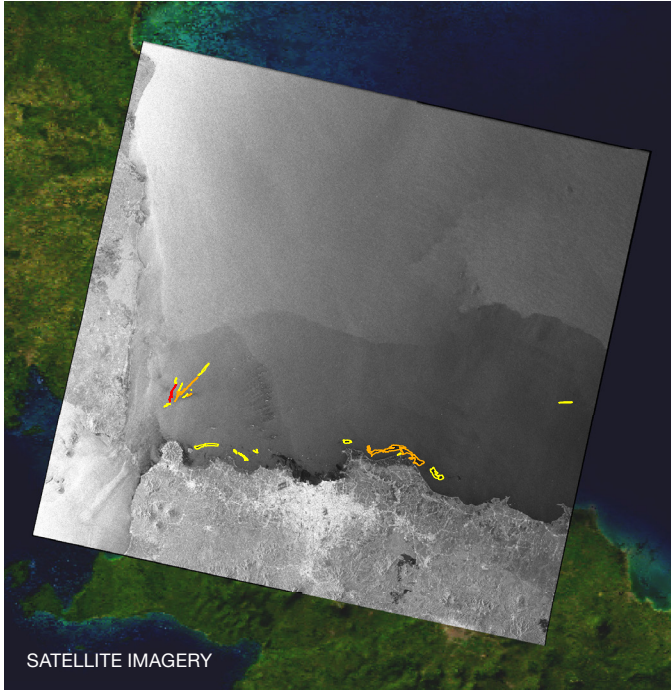




# SURVEILLANCE AND MODELLING

## Application

Dispersant effectiveness monitoring equipment, including fluorometers are deployed to support any dispersant operations. Additional monitoring and surveillance data can be provided by tracking buoys, remote sensing and 2D and 3D oil spill computer modelling.



## UAVs

Members have access to unmanned aerial vehicles (UAVs) through OSRL's strategic partnerships with a global network of UAV providers. UAV surveillance services can complement shoreline and inland surveys, shoreline and offshore tactical response operations, and site safety assessments



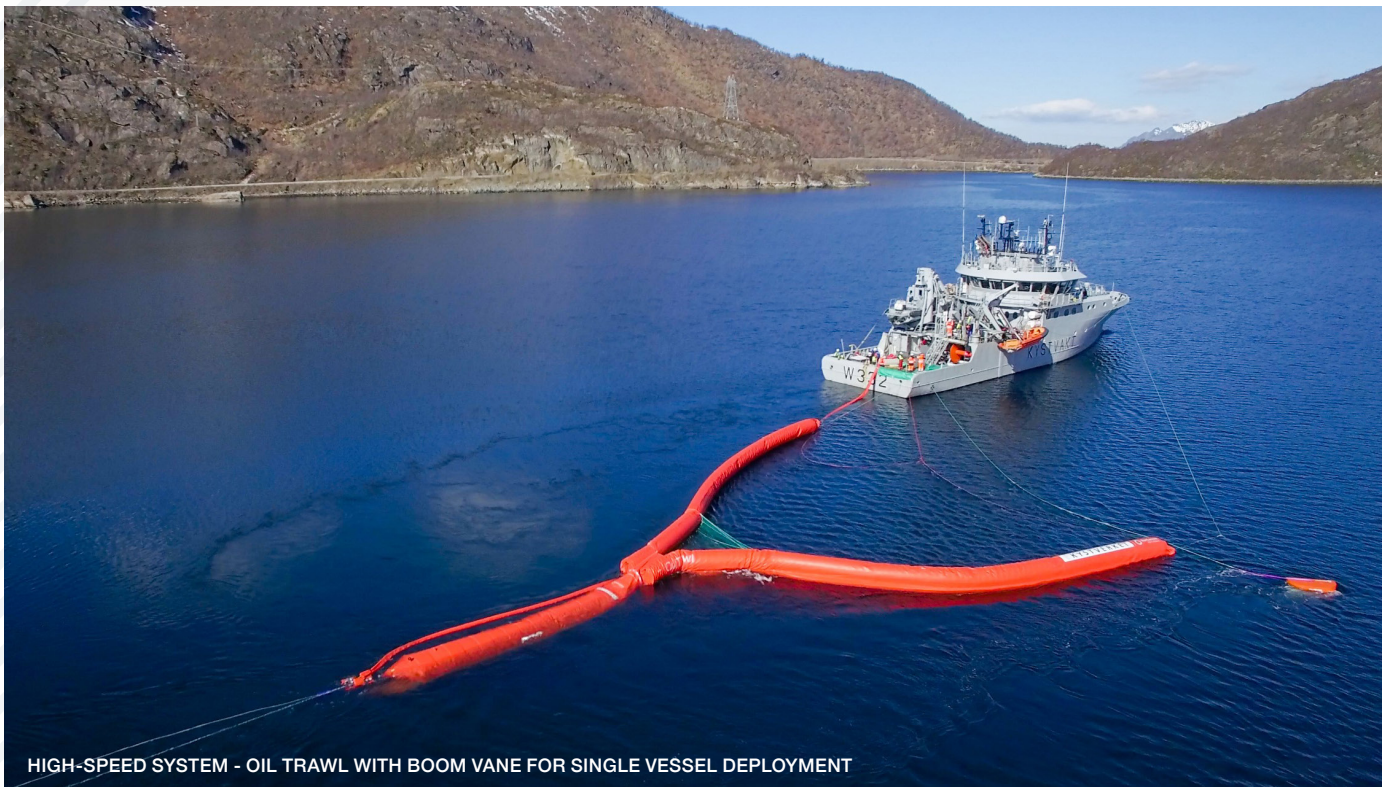
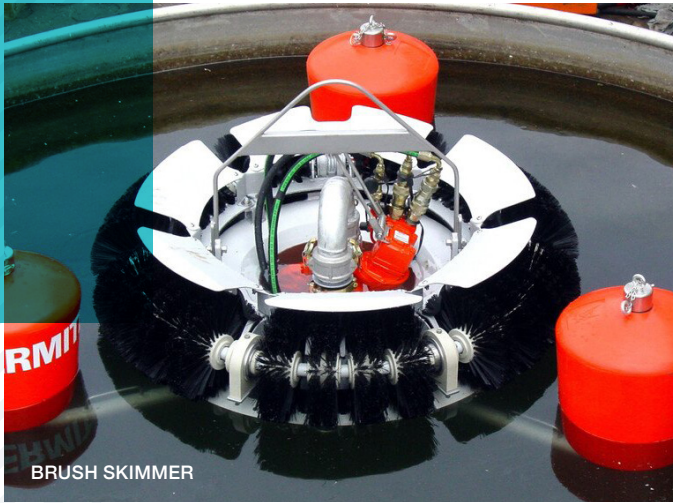
# AT-SEA CONTAINMENT AND RECOVERY

## Application

OSRL has a variety of booms that can be used to concentrate the oil for recovery in the often challenging offshore environment.

In certain circumstances, for example continued release scenarios, we are able to provide active booms systems with built-in recovery capability for uninterrupted containment and recovery operations.

In recent years the technology for offshore containment and recovery operations has evolved to address one of the biggest limiting factors in recovery efficiency-encounter rate. Traditional booms are limited to speeds of < 0.75 knots to avoid loss of containment, however new enhanced recovery systems increase this speed, so allowing a higher encounter rate and a greater recovery rate of oil.

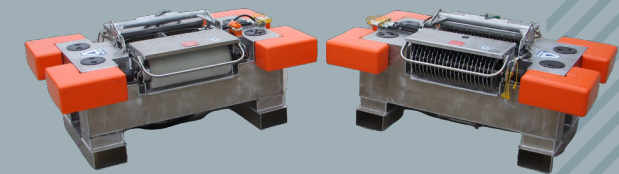




HIGH-SPEED SYSTEM - CURRENT BUSTER 6



OFFSHORE CONTAINMENT BOOM



INTERCHANGEABLE TOOTH DISC AND BRUSH SKIMMER

# IN-SITU CONTROLLED BURNING

## Application

Controlled burning can be an extremely valuable response technique when responding to oil releases in remote locations.

In-situ burn operations can be conducted safely with our water Hydro-Fire Booms located in Southampton and Singapore, which complement the stock of American Fire Booms located in Fort Lauderdale.

A guidance document on Health, Safety and Monitoring has also been developed to support such response.

Monitoring equipment is used when carrying out in-situ burning for the real-time detection of airborne particulates, fumes and aerosols.



# INLAND RESPONSE

## Application

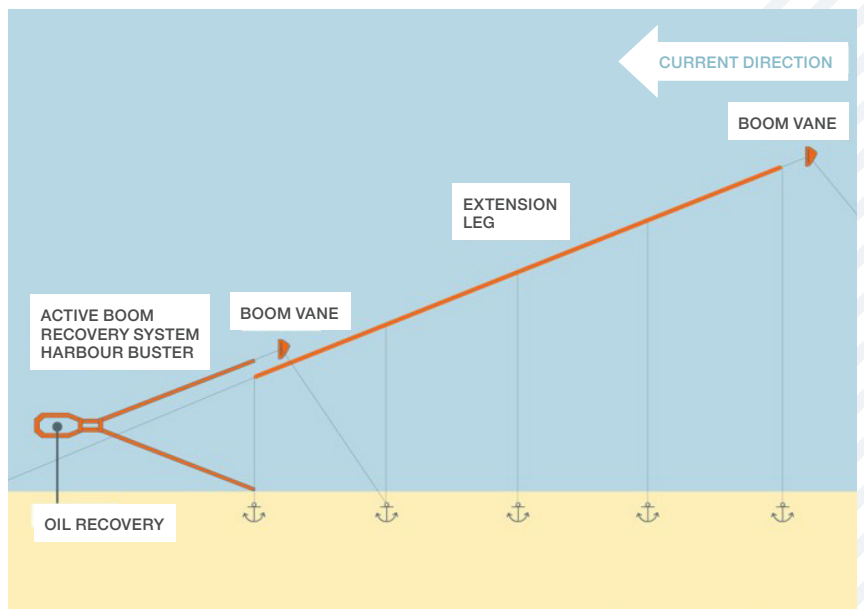
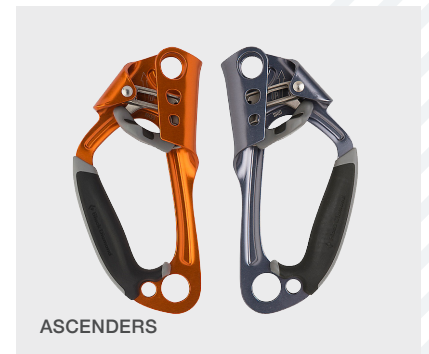
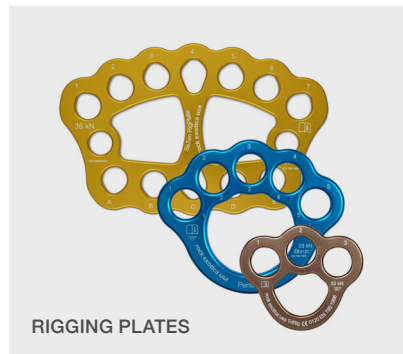
River booming, especially in fast currents where there is turbulent water and other challenges, such as rocks and gravel, requires the use of specialist equipment, which allows a greater level of control over boom positioning in the river.

Ascenders, karabiners, pulleys, slings, strops and rigging plates – items that are more commonly found in a climber’s kit bag – enhance your ability to set booms at the correct angles for deflection or collection.

The considerable effect of drag forces on boom as investigated by Hanson et al 2001 means that booms suitable for fast flowing currents must be constructed of hard wearing materials, have tension members on the top and the bottom, have a shallow skirt and have a solid floatation chamber.

OSRL also apply specialist methods for maximising the use of containment and recovery equipment in rivers and estuaries.

After a full equipment readiness audit, OSRL identified a range of new equipment to complement its existing stockpile of inland response resources. This equipment now forms part of dedicated fast water response packages.



Using a combination of containment and recovery and river booming equipment – extension leg configuration from a shoreline or river bank. Control lines anchored to the shore are used to hold the boom in position.

# SHORELINE CLEAN-UP/PROTECTION OF SENSITIVE RESOURCES

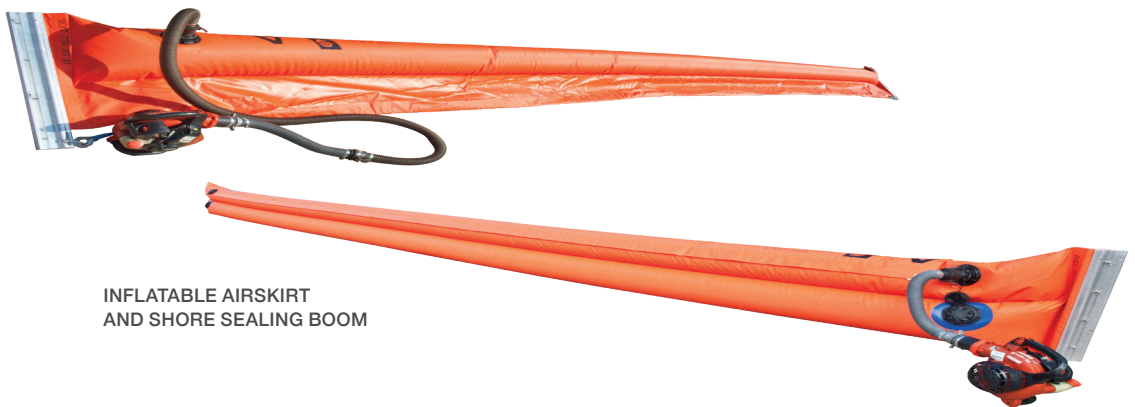
## Application

Due to the variety of operational conditions we may encounter, we hold a range of boom types that can be used for offshore, nearshore and shoreline responses.

The majority of our shoreline booms are air-inflatable to reduce the space required during shipping.

OSRL holds a large range of recovery devices that can be used on light, medium and heavy oils across all environments.

When used together, skimmers and booms allow recovery systems to be built for almost all situations. Our Duty Manager will assess the conditions, to select the most appropriate equipment package.



INFLATABLE AIRSKIRT  
AND SHORE SEALING BOOM



SOLID FLOATATION BOOM



FENCE BOOM



INTERCHANGEABLE BRUSH AND DISC SKIMMER



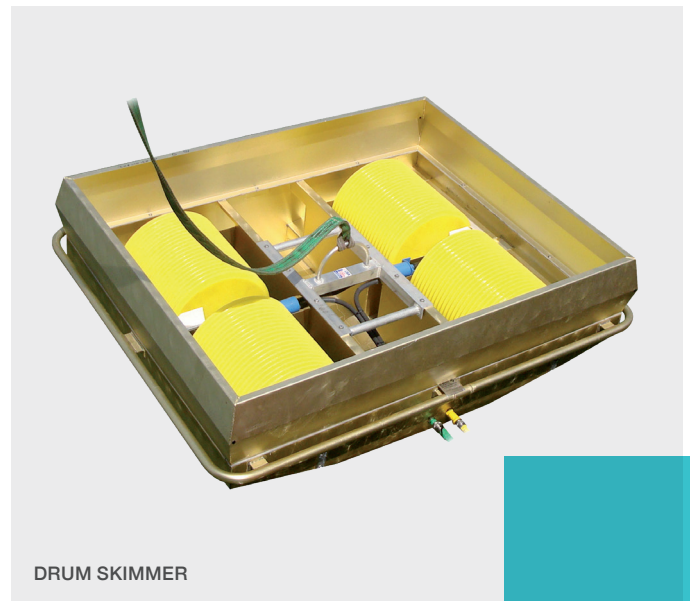
TOOTH DISC SKIMMER



VACUUM RECOVERY SKIMMER



OLEOPHILIC ROPE MOP SKIMMER



DRUM SKIMMER

# WASTE MANAGEMENT

## Application

We have several options for temporary waste storage. If recovery storage vessels are not available during offshore containment, the recovered oil can be temporarily stored in inflatable barges which come in two sizes: 25m<sup>3</sup> or 50m<sup>3</sup>. Towable bladders are also available for shallow waters which come in 10m<sup>3</sup>.

Waste containment tanks provide another form of storage for both offshore and shoreline scenarios. These tanks have a capacity of 9m<sup>3</sup> and can be used together with a heating system that is capable of heating high pour point oil.

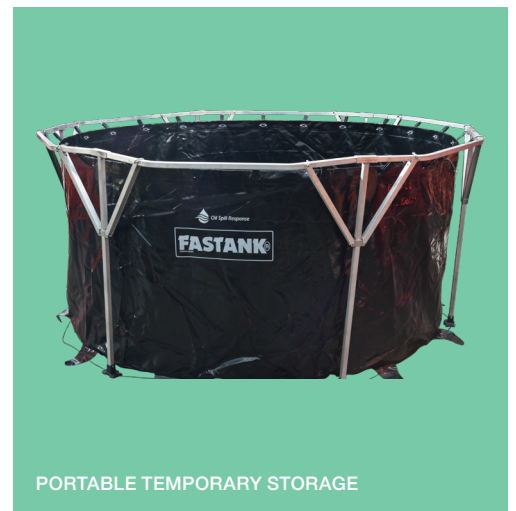
Temporary portable storage tanks are available in two sizes: 7.57m<sup>3</sup> or 2,000 gallons and 4.16m<sup>3</sup> or 1,100 gallons.



FLOATING TEMPORARY STORAGE BARGE



STORAGE SKID TANK



PORTABLE TEMPORARY STORAGE



OFFSHORE TEMPORARY STORAGE BLADDER



# OILED WILDLIFE RESPONSE

## Application

Recently updated and standardised for all operational bases under consultation with professional wildlife responders:

- Support the first 48 hours of a response
- Focus on birds
- Critical equipment for:
  - Search and capture
  - Medical
  - Cleaning and rehabilitation

This equipment, can be shipped together with other response equipment and should be utilised by trained wildlife response personnel. Equipment is palletised and configured to support the logistical needs of an incident by grouping items for use in-field or in a rehabilitation facility.

**Note:** OSRL's wildlife equipment packages are intended for use as critical 'first strike' equipment for an initial response. Trained wildlife responders, Additional equipment and supplies will be required for a full-scale wildlife response operation.



## In-Field

Equipment and PPE to support activities such as surveillance, hazing, capture and transportation. Basic medical supplies are also included to support field stabilisation of impacted wildlife before onward travel to a rehabilitation facility.

## Rehabilitation

Equipment and PPE to support trained wildlife response personnel to care for and rehabilitate oiled animals. Specialised medical equipment is included for triage and blood analysis. Packages also include identification bands and animal husbandry supplies as well as equipment for animal cleaning (washing, rinsing and drying). A water filtration system complements conditioning pools used in pre-release care and conditioning.



WASH, RINSE & DRY



CONDITIONING POOLS & WATER FILTRATION SYSTEM



MEDICAL AND SURGICAL



TRIAGE AND BLOOD ANALYSIS



TEMPORARY & PERMANENT IDENTIFICATION

# VEHICLES & VESSELS

## Application

We can provide a variety of vehicles suitable for response duties. In a shoreline environment, all-terrain vehicles offer a safe and efficient way of moving equipment in the spill location. Larger vehicles, such as 4x4s and tractor units, can also be provided to transport people and equipment.

We offer a variety of vessels such as small inflatable vessels, RIBs, workboats, landing craft and fast response vessels for inshore and coastal response. Larger vessels are for regional use only.

For harbour and nearshore waters in and around Singapore, our 20-metre catamaran vessel can be equipped with a variety of response equipment depending on the nature of the spill.



4X4 VEHICLE



6X6 VEHICLE



INFLATABLE BOAT WITH OUTBOARD MOTOR



RIGID HULL INFLATABLE BOAT



LANDING CRAFT



DEDICATED OIL SPILL RESPONSE VESSEL

# SITE SAFETY, CLEAN-UP & ANCILLARY

## Application

We hold a large variety of ancillary equipment suitable for different aspects of oil spill response operations.

Pressure washers are available to clean response equipment and oiled man-made structures.

Powered floodlights are also available for use onshore and offshore.

We provide both area and personal gas monitors, used in conjunction with our site entry protocols to mitigate health and safety risks.

A range of general purpose transfer pumps with different capacities depending on the required application.

We have several types of diesel hydraulic power packs that are suitable to operate oil recovery devices, boom reels and deployment ancillary equipment.

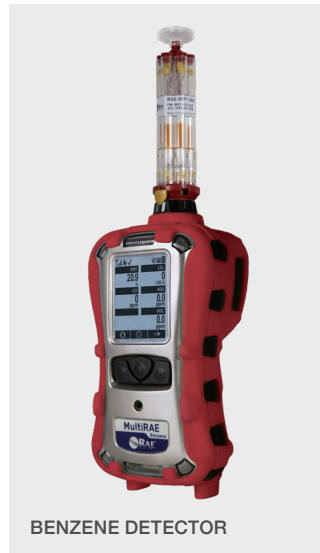
All power packs are provided with the necessary spares kit and ancillaries.



PORTABLE LIGHTING SET



SUBMERSIBLE TRANSFER PUMP



BENZENE DETECTOR



HEAVY OIL TRANSFER PUMP



TRANSFER PUMP



HYDRAULIC POWER PACK



HYDRAULIC PRESSURE WASHER

# COMMAND EQUIPMENT

## Application

We have a range of communications equipment suitable for setting up a field command post to relay information to the command centre and coordinate tactical response operations.

VHF Base Stations and VHF Repeater Stations are compatible with all internationally recognised marine VHF channels and offer robust communications links in areas without cell phone coverage.

We offer Satellite Communications Packages, including Iridium satellite handheld phones, and Broadband Global Area Network (BGAN), which is provided by INMARSAT to allow internet access from virtually all areas of the world (except for polar regions). The use of this simple and portable BGAN allows access to email and other office applications.

We also provide portable shelters for use as a command centre, a first aid post, a maintenance area and as a shelter for personnel taking rest breaks.



PORTABLE BGAN VOICE AND DATA TERMINAL



VHF REPEATER STATION AND VHF BASE STATION



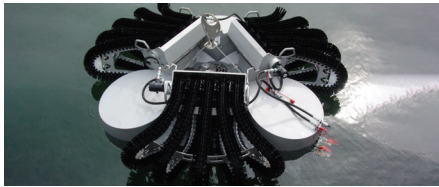
TELESCOPIC MAST



COMMAND PALLET

# PRE-PACKAGED LOADS

Much of our equipment is prepackaged into tried and tested systems suitable for almost any scenario. These packages shorten deployment times and allow equipment capabilities to be easily matched to support the chosen response strategy. Of course, every spill is different and following discussions with our Duty Manager, your equipment packages can be tailored to suit your specific requirements. For example, additional equipment such as mobile command centres or ATVs can be added to supplement the standard packages.



## High Volume Recovery Systems (Offshore)

(UK and Singapore)

**Application:** The high volume offshore recovery package is designed to provide offshore recovery for light, medium or heavy oils using oleophilic brush skimmer method. The system is situated on a 20ft offshore certified (DNV) flat rack container with a built-in crane to enable easy and efficient mobilisation of the whole system.

**Contents:** Large Brush Skimmer /Hose Reel x 2 /119kW Power Pack with inbuilt air fan /HIAB crane



## High Volume Offshore Recovery Systems (Containment & Recovery)

**Application:** The weir boom has the capability to concentrate and collect large quantities of oil at sea and to remove this oil via its integrated skimming system. The system will operate in moderate sea states with wind speeds up to 21 knots and wave heights up to 3m, though operational efficiencies will be reduced as these extremes are approached. The system is designed with the capability to be air-freighted.

**Ancillaries:** Weir Pumps /Recovered Oil Discharge Pump /System Hoses / Reel Controls /Reel drive /Water Pump



## Fast Response Trailers (Bahrain Load 1 & 2)

**Application:** The trailers have been equipped with shoreline booms and ancillaries to enable us to react quickly and deploy rapidly to protect specific sites at risk. Due to the region's reliance on salt water intakes for numerous uses, these loads provide the capability for prompt action in order to protect this vital resource from contamination.

**Contents:** Shore Sealing Boom / Nearshore Inflation Boom /Ancillaries for deploying equipment



## Shoreline Package Standard

(UK, Singapore, Bahrain)

**Application:** A shoreline clean up and protection package packed into our unique aircraft pallets, designed for use with side loading aircraft. The package consists of 16 pallets which can be supplemented with other palletised or non-palletised equipment from the stockpile.

**Contents:** Nearshore Inflation Boom 240m in 10m & 20m lengths /Shore Sealing Boom 400m in 10m & 20m lengths /Boom Ancillary Pallet / Command Pallet /Disc Skimmers capacity 12 & 20 ton per hr /Vacuum system /Inflatable Shelters /Portable Frame Tanks x 8 /Displacement Pumps x 3 /Decontamination Station

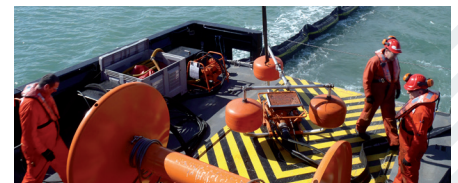


## Shoreline Package Standard Supplement

(UK, Singapore, Bahrain)

**Application:** A shoreline clean up and protection package packed into our unique aircraft pallets, designed for use with side loading aircraft. This load would typically be used in addition to the Standard Shoreline Package.

**Contents:** Nearshore Inflation Boom 390m in 10m and 20m lengths /Shore Sealing Boom 320m in 10m and 20m lengths /Boom Ancillary Pallet / Command Pallet /Disc Skimmer capacity 7 ton per hr /PPE Pallet / Discharge Hose Pallet /Portable Frame Tanks x 7 /Vacuum system /Transfer Pump



## Shoreline Package Heavy Oil Supplement

(UK, Singapore, US, Bahrain)

**Application:** A shoreline clean up and protection package packed into our unique aircraft pallets, designed for use with side loading aircraft. This load would typically be used in addition to the Standard Shoreline Package, when heavy oil recovery and transfer pumping is required.

**Equipment Delivery:** Nearshore Inflation Boom 80m - 10m & 20m lengths /Shore Sealing Boom 80m in 10m & 20m lengths /Boom Ancillary Pallet /Archimedes Screw Pumps x2 /Weir Skimmer capacity 20 & 30 ton per hr /Drum Skimmer capacity 30 ton per hr /Disc Skimmer capacity 40 ton per hr /84 kW Power Pack x2 /23 kW Power Pack /Discharge Hose Pallet /Portable Frame Tanks x7

# SUBSEA WELL INTERVENTION SERVICES (SWIS)

SUBSEA EQUIPMENT  
MOBILISATION CYCLE

MEMBER  
CALLS OSRL

OSRL VERIFIES  
SUBSCRIPTION

MEMBER CONFIRMS SPILL  
SCENARIO, EQUIPMENT REQUIRED  
AND COMPLETES PAPERWORK

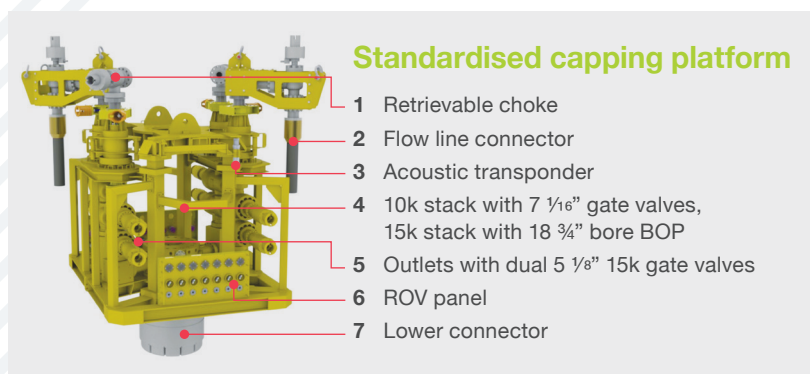
## Capping Stack System & Subsea Incident Response Toolkit (CSS/SIRT)

Through a Supplementary Agreement, we can provide our Members with access to an integrated intervention system comprising four Capping Stacks and two Subsea Incident Response Toolkits.

We own, store and maintain four capping stacks in four international locations – Brazil, Norway, Singapore and South Africa. They are maintained ready for immediate mobilisation and onward transportation by sea and/or air in the event of an incident. Two capping stacks (Norway and Singapore) have enhanced air freight capability using dedicated air freight skids in AN-124 airframes with minimal reconfiguration required.

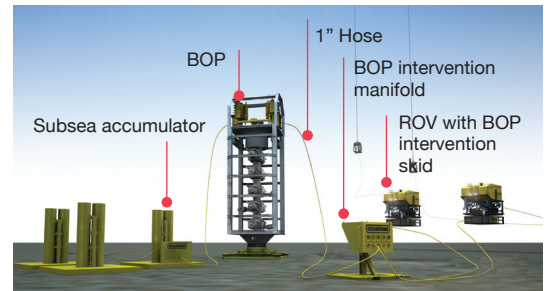
Subscription to CSS/SIRT provides our Members with access to the capping stacks and the ability to mobilise two in the event of an incident. Subscription also provides access to the Subsea Incident Response Toolkits which are an integral part of capping operations enabling BOP intervention, debris clearance and the subsea application of dispersant at a wellhead. They assist in creating safer surface working conditions for response personnel and enhance the degradation of the oil.

Subscription to the CSS/SIRT service also provides access to Water Column Monitoring equipment to support subsea dispersant application. Access to SEA/Response vessel software is provided as part of subscription, which provides the ability to track/monitor and develop high-level Response Time Models utilising real time vessel data globally. Subscribers of the CSS/SIRT are invited to participate in a Mutual Aid Framework Agreement for personnel with other subscribers.



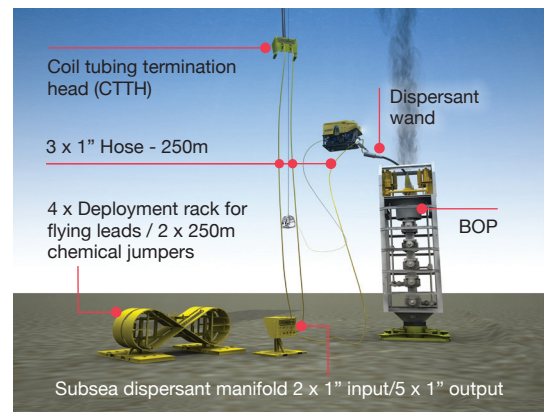
### KEY FACTS

- Two capping stacks developed to handle pressure up to 15k PSI (Brazil and Norway).
- Two capping stacks designed for pressure up to 10k PSI (Singapore and South Africa).
- Designed for subsea wells in water depths to a maximum of 3,810m (12,500 ft).
- Designed, optimised and standardised to meet the majority of anticipated oil well conditions in deep water drilling around the world.
- Subsea Incident Response Toolkits (SIRT) are stored in Brazil and Norway ready to be mobilised in the event of an incident.



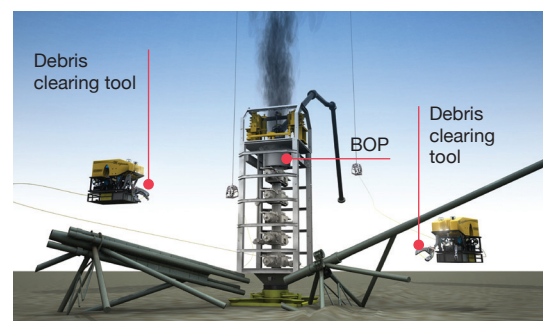
### Blow out preventer emergency intervention

In the unlikely event that the rig fails to close off the BOP, emergency BOP intervention is required.



### Subsea dispersant system

This system allows for the subsea application of oil dispersant at the wellhead. This will create safer surface working conditions for response personnel and enhance the degradation of oil.



### Debris clearance

Each subsea toolbox consists of various tools for removing debris to allow access for dispersant applications and work on Blow Out Preventers, etc. This also includes tools for site surveys prior to commencement of work, e.g. 2D and 3D sonar.

## Water Column Monitoring Equipment

Subscription to SWIS Capping Stack System also provides access to the Water Column Monitoring (WCM) equipment. The WCM equipment is primarily utilised to monitor Subsea Dispersant Injection (SSDI) effects. It can also be employed when SSDI is not a response option as it contains useful instrumentation and tools to enable sampling and monitoring in deep-water settings.

### The equipment

Designed for mobilisation on an offshore supply vessel, the WCM equipment includes two 8 ft x 20 ft containers functioning as shipboard workspaces during deployment. The equipment enables in-situ sampling and monitoring in water depths up to 3,000 metres. The equipment is self-contained and mobilisation-ready.



OPERATIONS (LEFT) AND  
LABORATORY WORK VANS

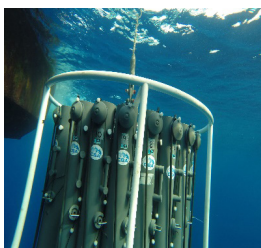
In-situ sampling and monitoring of the water column characteristics is achieved through:

- A carousel equipped with Teflon-lined GO-FLO bottles, which is remotely triggered at any depth to collect water samples for laboratory analysis.
- Screening of water samples for volatile compounds using a mobile gas chromatograph/mass spectrometer (GCMS).
- Storing samples in commercial grade, under-counter refrigeration units or sub -80°C freezer unit until shipment to a shore-based laboratory for analysis.

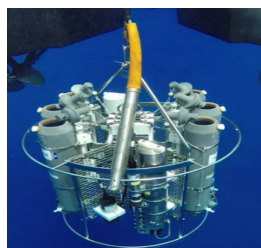
Water column characteristics are measured with depth to generate hydrographic profiles. This is achieved through the following instruments:

- Conductivity Pressure Depth (CTD) Profiler
- Dissolved Oxygen Sensor
- Fluorometers (two sensors: CDOM and ECO-FLNTU)
  - Coloured Dissolved Organic Matter (CDOM) allows you to obtain CDOM fluorescence across a wide range of environments
  - ECO-FLNTU combines an Environmental Characterisation Optics (ECO) fluorometer with an optical scattering measurement for simultaneous determination of turbidity.

In addition to the suite of instruments listed, the WCM equipment also includes LISST-Deep and LISST-100X to analyse particle size.



WATER SAMPLER ROSETTE



WATER SAMPLING CAROUSEL  
WITH CTD PROFILER AND  
INSTRUMENTATION



GCMS INSTRUMENTATION

## OSPRAG Capping Device - UKCS

The OSPRAG Capping Device is a key component in the UK offshore oil and gas industry's comprehensive oil spill contingency plans, which also includes oil control, containment, recovery, dispersant (aerial and subsea) and shoreline protection using booms. The capping device is stored and maintained at an operational base in Aberdeen, Scotland and can be deployed quickly from a multi-service vessel or drilling rig. Its size and weight means it can be transported by a wide range of vessels.



OSPRAG CAPPING DEVICE

### KEY FACTS

- Built to cap uncontrolled subsea well in the unlikely event of a blowout, minimising environmental damage.
- The modular design supports connection to subsea equipment and deployed to the widest possible range of subsea well types and oil spill scenarios which could occur – including in the deep waters and harsh conditions West of Shetland.
- The size and weight support rapid deployment from a wide range of vessels, even during short weather windows.

# SUBSEA WELL INTERVENTION SERVICES (SWIS)

## Containment Toolkit

This containment toolkit complements the subscription to the Capping Stacks/SIRT via an additional Supplementary Agreement. 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 containment toolkit is designed to supplement standard industry well test hardware to create a containment system. It comprises long-lead equipment not currently readily available in the industry and minimises response times by allowing a responding well operator to draw on existing resources.

The toolkit is stored in strategic locations around the world to facilitate timely response. The flexible pipes are stored in three regional sets in Brazil, UK and Singapore. All other containment toolkit components are air-freightable and are stored at the original equipment manufacturers' facilities in the UK, Houston and Norway.

### SUBSEA WELL CONTAINMENT TOOLBOX SPECIFICATION

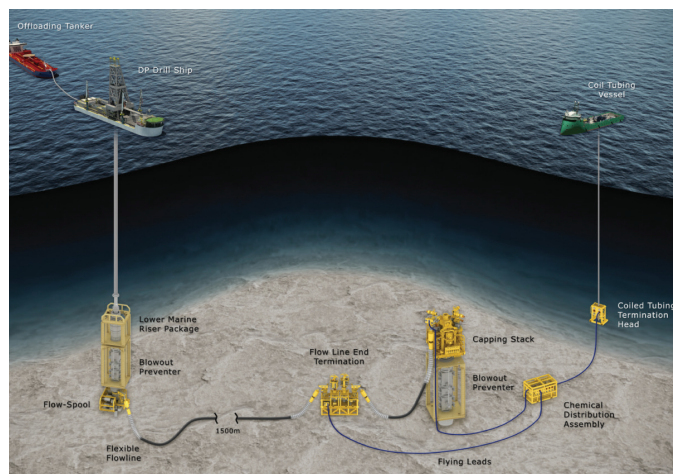
|                                  |  |
|----------------------------------|--|
| Water depth                      | Up to 3,000m   |
| H2S content                      | 0 to 500ppmV   |
| Design temperature (operation)   | -1°C to 130°C  |
| CO2 content                      | 0 to 10 mol %  |
| Containment toolkit storage life | 20 years   |
| Max temperature                  | 130°C (operation)  |
| Design operating life            | 2 x 6 month deployments  |
| Design temperature (storage)     | -20°C to 40°C  |
| Transportability                 | Air (Boeing 747-400 ERF; excluding flexible flowlines), land and sea |

## How it works

The containment concept relies on existing drilling rigs and commercially-available well-testing equipment to capture fluids from an incident well and flow them to the surface for processing and disposal.

From the capping stack, hydrocarbons are directed through the flowline end termination (FLET) via flexible pipes. From the FLET, the flow continues through a flexible pipe and the flow-spool assembly into a standard well testing riser terminating at a mobile offshore drilling unit (MODU). Well hydrocarbons are processed in the standard surface well testing equipment, stabilised and then offloaded to a tanker positioned at a safe distance from an incident well.

To maintain flow assurance, hydrate inhibitor can be supplied via the coiled tubing spread deployed on a marine vessel to a coiled tubing termination head (CTTH) and onward to the chemical distribution assembly (CDA). The hydrate inhibitor can be delivered to the FLET and capping stack via the CDA.



### Flowline end termination and Connectors (FLET)

Subsea hardware installed at the end of flexible pipes to enable ROV operated functions, venting functionality and pressure control.

Location: Houston, USA  
Size: 6.2m x 2.5m x 3m  
Weight: 32 tonnes

### Diver-less subsea connectors

Standard ROV operated subsea hardware used to connect flexible pipes to a capping stack, FLET, flow spool assembly and burst disk trees.

Location: Minnesota, USA  
Size: 1.6m x 1.2m x 1.9m  
Weight: 3.3 tonnes

### Chemical distribution assembly (CDA)

Hardware for distribution of hydrate inhibitor to the FLET and/or to the capping stack.

Location: Stavanger, Norway  
Size: 2.5m x 2m x 2.3m  
Weight: 6 tonnes

### Hose end valves (HEV)

End valves on the marine offloading hoses for safe coupling to the offloading tanker.

Location: Stavanger, Norway  
Size: 1.5m x 1.8m x 1.1m  
Weight: 2.5 tonnes

### Pumps and coolers

Transfer pumps stabilise crude from low pressure separators to the offloading tanker. The cooling system ensures that stabilised crude meets the temperature specification for the storage tanker.

Location: Port of Blyth, UK  
Size: Ranging between 6m and 9m in length x 2.3m x 2.5m  
Weight: between 7.8 and 12.5 tonnes

### Flow spool with subsea test tree latch

Assembly that connects the flexible pipes to a standard well testing riser and interfaces with standard wellhead foundation and MODU BOP equipment.

Location: Houston, USA  
Size: 4.3m x 3.7m x 3.8m  
Weight = 43.5 tonnes

### Coiled tubing termination head (CTTH)

A hydrate inhibitor distribution hardware suspended from the coiled tubing to de-couple the dynamic section of the coiled tubing riser from the static CDA.

Location: Stavanger, Norway  
Size: 1.5m x 1.1m x 1.8m  
Weight = 3 tonnes

### Deployment reels for flying leads

The 1" and 2" flying leads are coiled on deployment reels for safe subsea installation of flying leads between the CTTH, CDA, capping stack and the FLET, for hydrate inhibitor supply to the cap or FLET(s).

Location: Stavanger, Norway  
Size: 6.2m x 2.4m x 2.6m  
Weight = 12 tonnes

### Flexible pipes

Connect pipe between the capping stack, FLET and the flow-spool assembly.

Location 1: Blyth, UK  
Location 2: Angra, Brazil  
Location 3: Loyang, Singapore  
Inner diameter = 6"  
Lengths = 250m, 850m, 1200m

### Marine offloading hoses

Allows secure transfer of hydrocarbons from the capture vessel to the offloading tanker.

Location: Port of Blyth, UK  
Size: 11m x 3.2m x 1.6m



## Offset Installation Equipment

For shallow water scenarios (75–600m), where hydrocarbon may be present at the surface directly above the incident well, Offset Installation Equipment (OIE) allows responding personnel to remove or install capping or related equipment from a safe offset distance from an incident site.

### How it works

The carrier, which forms the main item of OIE, comprises the following main equipment:

- Ballast tanks with air connection to topside compressors
- A winch system to control the carrier position and lift payloads
- A Cardan joint for capping stack positioning
- ROV interface for controlling all carrier functions from the topside control room

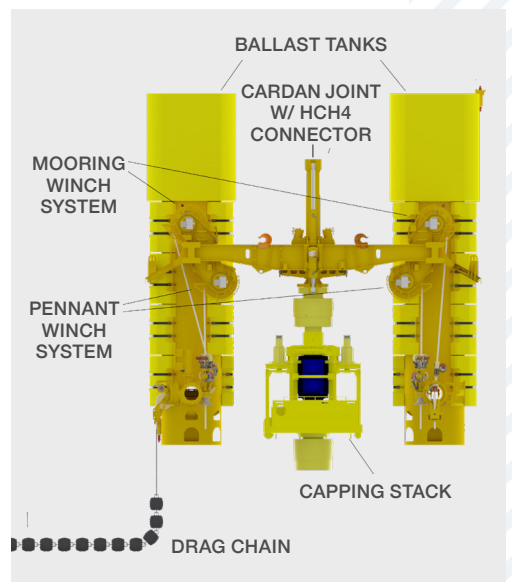
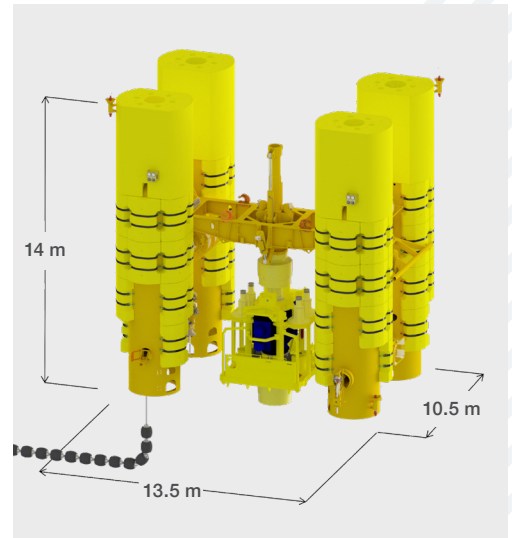
The carrier is initially submerged from a vessel using a depressor weight and free flooding of the four ballast tanks. Once submerged, a drag chain provides passive height control (relative to the seabed) which allows the carrier to be moved laterally by vessels into the vicinity of the incident well.

Positive buoyancy of the carrier is maintained using the ballast tanks, clad with buoyancy modules, and when used in conjunction with the ballast tank air system, provides sufficient uplift to carry a variety of response equipment payloads.

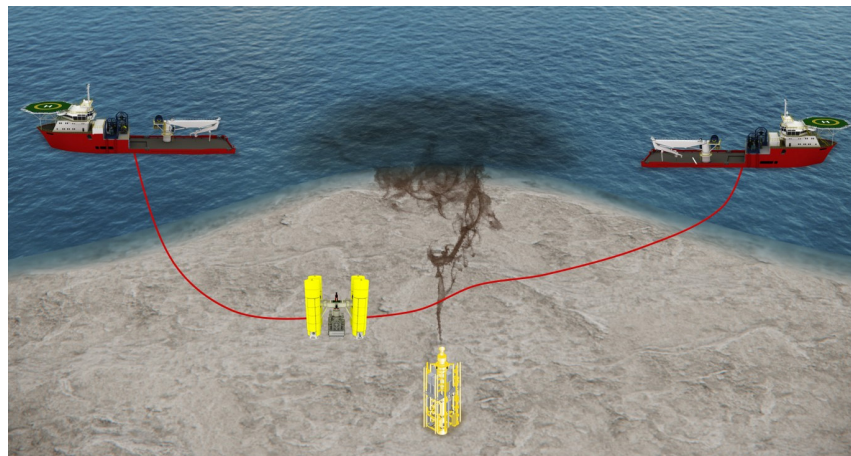
Positional control of the carrier in the vicinity of the well is achieved using mooring winches. Once over the well, the Cardan joint provides the capability to align and lower the capping stack (or other equipment) onto a blowout preventer (BOP or wellhead).

The carrier is controlled via a Well Owner sourced remotely operated vehicle (ROV) which provides an interfaced for hydraulics, power and communications.

Other equipment to support OIE Carrier intervention operations include control and workshop containers, assembly and transport equipment and air supply equipment from topside to subsea. All equipment is stored and maintained in Trieste, Italy.



OFFSET INSTALLATION EQUIPMENT PICTURED HANDLING A CAPPING STACK (TOP) AND SIDE VIEW (BOTTOM) WITH FRONT BUOYANCY ASSEMBLIES REMOVED TO SHOW STRUCTURAL FRAME



### KEY FACTS

- OIE can be deployed up to 500m radius offset from an incident site
- Suitable for use in working depth range of 75–600m
- Compatible with OSRL's capping equipment
- Available to the international oil and gas industry via membership of OSRL and a supplementary subscription

# CONTACT US

## AMERICAS

### BRAZIL

Brasil Serviços de Contenção de Vazamento de Petróleo Ltda.  
Av. Rio de Janeiro,  
780, parte (MultiRIO)  
Caju, Rio de Janeiro, Brazil, ZIP  
20.931-675  
T: +55 24 99928 4890  
E: [brazil@oilspillresponse.com](mailto:brazil@oilspillresponse.com)

### FORT LAUDERDALE

Oil Spill Response (Americas)  
Limited  
2381 Stirling Road, Ft Lauderdale,  
FL 33312 USA  
T: +1 954 983 9880  
F: +1 954 987 3001  
E: [fortlauderdale@oilspillresponse.com](mailto:fortlauderdale@oilspillresponse.com)

### HOUSTON

10497 Town & Country Way,  
Suite 830, Houston, TX 77024  
USA  
T: +832 431 3191  
F: +1 832 831 6694  
E: [houston@oilspillresponse.com](mailto:houston@oilspillresponse.com)

## EUROPE, MIDDLE EAST & AFRICA

### ABERDEEN

Suite 3, Second Floor,  
Ocean Spirit House West,  
33 Waterloo Quay,  
Aberdeen, AB11 5BS  
United Kingdom  
T: +44 (0)1224 726859  
F: +44 (0)1224 726860  
E: [aberdeen@oilspillresponse.com](mailto:aberdeen@oilspillresponse.com)

### BAHRAIN

PO Box 54211, Manama,  
Kingdom of Bahrain  
T: +973 1773 0961  
F: +973 1773 0058  
E: [bahrain@oilspillresponse.com](mailto:bahrain@oilspillresponse.com)

### GHANA

OSRL Ghana Ltd  
C290/14 Okwei Lane  
Dzorwulu, Accra, Ghana  
T: +233 30 279 7555  
F: +233 30 279 7554  
E: [osrlghana@oilspillresponse.com](mailto:osrlghana@oilspillresponse.com)

### ITALY

Saipem S.p.A - Adriaterminal  
Porto Franco Vecchio  
34143 Trieste, Italy  
E: [triesteemailist@oilspillresponse.com](mailto:triesteemailist@oilspillresponse.com)

### NORWAY

Risavika Havnering 235,  
4098 Tananger,  
Norway  
T: +47 95284299/91806074  
E: [norway@oilspillresponse.com](mailto:norway@oilspillresponse.com)

### SOUTHAMPTON (REGISTERED OFFICE)

Lower William Street,  
Southampton, SO14 5QE  
United Kingdom  
T: +44 (0)23 8033 1551  
F: +44 (0)23 8033 1972  
E: [southampton@oilspillresponse.com](mailto:southampton@oilspillresponse.com)

### SOUTH AFRICA

Old MossGas Site,  
1132 Camp Street,  
Saldanha Bay, South Africa 7395  
T: +27 22 714 3211  
F: +27 22 714 3626  
E: [southafrica@oilspillresponse.com](mailto:southafrica@oilspillresponse.com)

## ASIA PACIFIC

### AUSTRALIA

Oil Spill Response Pty Ltd  
108 St Georges Terrace  
Level 24  
Perth, WA 6000, Australia  
T: +61 6557 8551

### SINGAPORE

25C Loyang Crescent,  
Loyang Offshore Supply Base  
(Block 503 TOPS Avenue 3)  
Singapore 506818  
T: +65 6266 1566  
F: +65 6266 2312  
E: [singapore@oilspillresponse.com](mailto:singapore@oilspillresponse.com)

FOR CORPORATE AND MEMBERSHIP ENQUIRIES PLEASE CONTACT [MEMBERSHIPTEAM@OILSPILLRESPONSE.COM](mailto:MEMBERSHIPTEAM@OILSPILLRESPONSE.COM)  
FOR SUBSEA WELL INTERVENTION SERVICES ENQUIRIES PLEASE CONTACT [SUBSEASERVICES@OILSPILLRESPONSE.COM](mailto:SUBSEASERVICES@OILSPILLRESPONSE.COM)  
FOR ALL OTHER ENQUIRIES PLEASE CONTACT YOUR NEAREST REGIONAL BASE.

[WWW.OILSPILLRESPONSE.COM](http://WWW.OILSPILLRESPONSE.COM)

