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/disk type and waist/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.

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### TABLE OF CONTENTS

1. **Offshore surface dispersant**
   - Boat spray // Boat spray nozzles with spray system // Helicopter dispersant // Neatsweep system

2. **Waste management**
   - Offshore temporary storage barge // Storage skid tank // Offshore temporary storage bladder // Portable temporary storage

3. **Oiled wildlife response**
   - Oiled wildlife response kit // Cleaning and rehabilitation equipment

4. **Vehicles & vessels**
   - 6x6 vehicle // 4x4 vehicle // Inflatable boat with outboard motor // Rigid hull inflatable boat // Landing craft // Dedicated oil spill response vessel

5. **Site safety, clean-up and ancillary equipment**
   - Hydraulic pressure washer // Benzene detector // Submersible transfer pump // Portable lighting set // Heavy oil transfer pump // Transfer pump // Hydraulic power pack

6. **Command equipment**
   - VHFR repeater station // VHFR base station // Command pallet // Telescopic mast // Portable BGAN voice and data terminal

7. **Pre-packaged loads**

8. **Subsea Well Intervention Services (SWIS)**
   - Cessna 337G Skymaster // The TERSUS System // Boeing 727 // Hercules C-130A // Piper PA-31 Navajo

9. **Surveillance and modelling**
   - UAVs // Oil spill tracking buoy // C3 fluorometer // Satellite imagery // 3D and 2D oil spill modelling

10. **At-sea containment and recovery**
    - 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

11. **In-situ controlled burning**
    - Fire boom // Particulate air monitor

12. **Inland response**
    - Cascade deflection boom // Karibeners, rigging plates and ascenders // Combination of methods

13. **Shoreline clean-up/containment resources**
    - 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. **Subsea Well Intervention Services (SWIS)**
    - Subsea Capping Device – UKCS // Containment Toolkit // Offset Installation Equipment

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

**HERCULES C-130A**

Provides wide area dispersant application

- **Location:** Malaysia
- **Mobilisation time:** 6 hours
- **Range:** 2,350 nautical miles in 8 hours
- **Dispersant capacity:** 13,000 litres

**PIPER PA-31 NAVAJO**

Provides aerial surveillance service

- **Location:** Doncaster, UK
- **Mobilisation time:** 60 minutes (within daylight hours)
- **System capability:** OFL Turret fitted with DSLR camera, HD video camera, laser range finder, ultraviolet and infrared sensors

**CESSNA 337G SKYMASTER**

Provides aerial surveillance service

- **Location:** Libreville, Gabon
- **Location:** Lome, Togo
- **Mobilisation time:** 4 hours

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.

**HELICOPTER DISPERSANT DELIVERY SYSTEM**

**AVIATION CAPABILITY**

**BOEING 727**

Provides wide area dispersant application

- **Location:** Doncaster, UK
- **Range:** 2,500 nautical miles in 5 hours
- **Dispersant capacity:** 15,000 litres

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.

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.

**The TERSUS system**

**RIDSS**

- **Location:** Libreville, Gabon
- **Location:** Lome, Togo
- **Mobilisation time:** 4 hours

Locations of aircraft are updated on www.oilspillresponse.com
Service Level Agreement (SLA) Dispersant Stockpile

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 stockpile cover the widest range of 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

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*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 retaining 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 allow 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

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<tr>
<td></td>
<td>500 /132,500</td>
<td>Rio de Janeiro, Brazil</td>
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</table>

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

Mobilisation

Prior to a response

Storage and maintenance of stockpile

Annual subscription fees paid by Members

On mobilisation

Loading of dispersant and ancillary equipment onto Members arranged transport at OSRL storage facility to final destination. Note, OSRL can arrange transport on the Member’s behalf.

During response

Provision of advice and assistance on request

Responsible for engaging with local government with regards to dispersant use

DISPERSANT COUNTRIES OF APPROVAL

Basic Stickgone NS

Australia, Benin, Cyprus, France, Greenland, India, Israel, Libya, Korea, Laos, Brazil, Cameroon, Ethiopia, Egypt, France, India, Indonesia, Israel, Kazakhstan, Malaysia, Morocco, Nigeria, Norway, Philippines, Portugal, ROPME Countries (Bahrain, Kuwait, Oman, Saudi Arabia, United Arab Emirates), Iraq, Iran, Qatar, Singapore, Tokyo, United Kingdom

Finasol OSR 52

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

Corexit EC9500A

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 (200m³) and Scalloway Shetlands (300m³). 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

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.

Specifications and locations

<table>
<thead>
<tr>
<th>TYPE</th>
<th>QUANTITY (M³/US GAL*)</th>
<th>LOCATION</th>
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</thead>
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<td>Scalloway Shetlands, UK</td>
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</tbody>
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SURVEILLANCE AND 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.
**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.
**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.
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: 25m³ or 50m³. Towable bladders are also available for shallow waters which come in 10m³.

Waste containment tanks provide another form of storage for both offshore and shoreline scenarios. These tanks have a capacity of 9m³ 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: 7.57m³ or 2,000 gallons and 4.16m³ or 1,100 gallons.

OILED WILDLIFE RESPONSE

Application
We hold a range of specialist wildlife response equipment, which can be used to assist with the rescue, initial treatment and rehabilitation of wildlife. This equipment, which was selected by professional wildlife responders, can be easily shipped together with other response equipment and would be utilised by trained wildlife response personnel.
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.

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.
**Equipped Communications**

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**

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.

**Application**

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.
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 the CSS/SIRT service also provides access to Water Column Monitoring equipment to support subsea dispersant application. 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 × 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.

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 determination of turbidity.

The size and weight support rapid deployment from a wide range of vessels. 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.

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.

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

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.
- 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.

Debris Clearing Tool

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.

- Acoustic transponder
- Subsea dispersant injection manifold
- 4 x Deployment rack for flying leads / 2 x 250m chemical jumpers
- BOP
- Debris clearing tool
- ROV with BOP intervention sled
- 1” Hose - 250m
- 3 x 1” Hose - 250m
- Subsea accumulator
- Debris clearing tool
- 4 x Deployment rack for flying leads / 2 x 250m chemical jumpers
- BOP
- Debris clearing tool
- ROV with BOP intervention sled
- 1” Hose - 250m
- 3 x 1” Hose - 250m

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.
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.

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) and capping stack, FLET and the flowline end termination (FLET) via flexible pipes. From the capping stack, hydrocarbons are directed through the flowline end termination (FLET) and capping stack, FLET and the flowline end termination (FLET) via flexible pipes.

Depending on the specific well, the chemical distribution assembly (CDA) can be delivered to the FLET and capping stack via the CDA.

Flowline end termination and connection (FLET)

Subsea hardware installed at the end of flexible pipes to enable ROV operated functions, venting functionality and standard wellhead foundation and MODU BOP equipment.

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

Flowline end termination and connection (FLET)

Subsea hardware used to connect flexible pipes to a capping stack, FLET, flowline spool assembly and burst disk trees.

Location: Minnesota, USA
Size: 1.6 m x 1.2 m x 1.9 m
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: 2.5 m x 2.5 m x 2.5 m
Weight: 6 tonnes

End valves (HEV)

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

Location: Stavanger, Norway
Size: 1.5 m x 1.5 m x 1.1 m
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: 4.3 m x 3.7 m x 3.8 m
Weight: 43.5 tonnes

Diver-less subsea connectors

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

Location: Stavanger, Norway
Size: 1.5 m x 1.1 m x 1.8 m
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 CTH, CDA, capping stack and the FLET, for hydrate inhibitor supply to the cap or FLET(s).

Location: Stavanger, Norway
Size: 6.2 m x 2.4 m x 2.6 m
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

Allow secure transfer of hydrocarbons from the capping stack to the offloading tanker.

Location: Port of Blyth, UK
Size: 1.1 m x 3.2 m x 1.6 m
Weight: 2.5 tonnes

Offset Installation Equipment

For shallower 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 floating 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 includes 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.

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

SUBSEA WELL INTERVENTION SERVICES (SWIS)