Property of Oil Spill Response	Document Title	Document Number OSRL-OPER-GUI-00705	
OSRL	LOGISTICS PLANNING GUIDE (LPG) SERVICE LEVEL AGREEMENT (SLA)	Revision	3

Logistics Planning Guide (LPG)

Service Level Agreement (SLA)

REVISION HISTORY

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1 Introduction

1.1 Disclaimer

The information contained within this document is for guidance and is correct at time of writing. During an exercise or emergency response, all information should be verified with OSRL to ensure the latest information is used for the mobilisation and onwards transportation of equipment.

1.2 Service Level Agreement Equipment

Oil Spill Response Limited (OSRL), together with its Affiliates is an industry owned and funded joint initiative, providing industry with the capability to better respond to incidents world-wide.

Through its relevant Affiliate companies (OSRL, together with its Affiliates shall hereafter be referred to as "OSRL"), OSRL provides the industry with the equipment, expertise and capability to better respond to incidents globally.

OSRL owns, maintains and stores in a response ready state, a global stockpile of equipment required for oil spill response operations. The Service Level Agreement (SLA) equipment covered in this Logistics Planning Guide (LPG) includes at sea containment and recovery, shoreline protection and clean up, in-situ burning, dispersant application, surveillance and monitoring, inland response, dispersant and ancillary equipment. The equipment is transportable by road, sea or air for deployment and can be called upon by any OSRL member.

1.3 Notification and Callout

Any component of the SLA equipment must be mobilised via the Southampton (UK), Singapore or Americas branches. All three locations are manned 24 hours/day to ensure your call is dealt with directly. During out of hours, the operator will contact a Duty Manager (DM).

Figure 1**:** Activation Procedure Card

In the event of an Incident where the Well Owner / Incident Owner (WO / IO) is considering mobilising the SLA equipment, OSRL should be notified immediately using the telephone numbers shown above and providing the basic information listed;

- Initial contact person - Telephone, fax and email information
- Location, source and time of spill
- Weather
- Company – Address, telephone, fax number etc
- Oil volume of the spill
- Oil type and Characteristics.

The following steps will then need to be followed, the OSRL DM will;

- Call back within 10 minutes (24 hours/day)
- Have extensive response experience
- Have access to a wide range of planning and predictive tools
- Act as the initial primary point of contact for the WO / IO

The OSRL DM will then verify membership subscriptions of the WO / IO.

The initial discussion between the OSRL DM and WO / IO will include;

- Scenario of spill
- SLA assets required
- Location SLA assets to be mobilised from
- Transportation mode (air/sea/land)
- Special logistics/permits required for mobilisation
- Additional oil spill response equipment required

The OSRL DM will forward the following documentation to the WO / IO based on the conversation above. The WO / IO will need to complete the following paperwork. Signatures are required, so paper copies are used.

- Notification Form (OSRL-OPER-FOR-00173 Rev9[1]), can be found on OSRL Website or DM will send after initial phone call)
- Mobilisation / Authorisation Form (OSRL-OPER-FOR-00172 Rev8[1]), can be found on OSRL Website or DM will send after initial phone call)

[1] *Revision numbers referenced in the document are the latest at the time of publication. During a mobilisation the Revision number of documents sent to the WO / IO may be higher than that shown here BUT should never be lower*

The mobilisation of equipment will continue as described in this document (Logistics Planning Guide – Service Level Agreement Equipment - OSRL-OPER-GUI-00705), with continued communications between OSRL and the WO / IO, but the 'Notification' process as described above, has been completed. OSRL will ensure that the communications flow shown below in **Figure 2**, is followed:

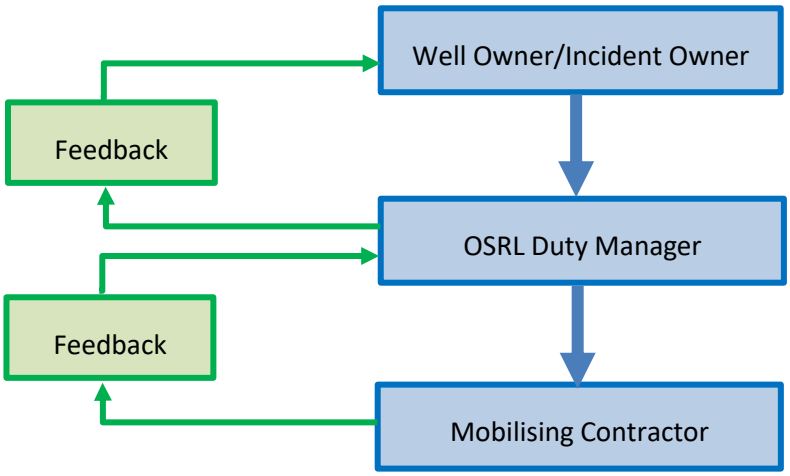


Figure 2: Communications Flow

1.4 Purpose

This Logistics Planning Guide (LPG) is an aid to the planning and understanding of the processes for the mobilisation and initial deployment phases of SLA equipment. This helps to ensure that operational logistics capability is delivered on time, in the right quantity and correct configurations, in a fully serviceable condition and crucially, to the right location. The guide covers details of the following:

- Equipment storage
- Storage media (containers and types etc.)
- Weights and dimensions
- Handling requirements
- Potential transport methods (air, road and sea)
- Documentation
- Contact details
- Lines of responsibility

This document should be read in conjunction with other reference documentation listed in **Section 7** of this LPG.

1.5 Audience

The LPG is designed to be a simple to use, ready reference document for use by OSRL Response and Logistics staff and WO / IO's Logistics staff, whilst also providing a structured overview for management.

1.6 Service Level Agreement Overview

The OSRL equipment provided under the Service Level Agreement (SLA) is designed for a variety of different oil spill scenarios.

Situations where equipment can be used are at-sea dispersal, at-sea containment and recovery, in-situ burning, shoreline recovery and shoreline clean-up. Specific equipment tailored to both hot and cold climates is available. Equipment is also held for inland response, both on land and within inland waterways.

All SLA equipment is stored and maintained ready for transportation by air, sea or road depending on our WO / IO's requirements (see Figure 3). The equipment is stored at OSRL four response bases which are strategically located around the world to facilitate a timely global response (see **Figure 4**). During a response, equipment will be mobilised from the most appropriate location to provide the timeliest and cost-efficient response.

Access to equipment is restricted to 50% by type of the equipment available at the time of request by a WO / IO, additional equipment requests may be considered but equipment could be subject to recall if required by another WO / IO.

Figure 3: Equipment Package Arrangement

2 Mobilisation

2.1 Global Storage Locations

Figure 4: Global Equipment Storage Locations

2.2 Storage configurations

Figure 4 above identifies the SWIS / Subsea bases and SLA equipment storage locations across the globe. The SLA stockpile is stored and maintained ready for transportation at a strategic location to facilitate a timely global response in United Kingdom, Singapore, Bahrain and USA. The equipment systems are stored in pre-defined pallets, ready to be loaded into a shipping container for road and sea freight, or loaded into an aircraft for air freight.

2.3 Initial nofication and mobilisation strategy for SLA equipment

Initial notification by the WO / IO and the process to follow in an incident, is detailed in **Section 1.3** above.

There are 3 mobilisation techniques for the SLA equipment:

Sea – SLA equipment pallets and items will be loaded into sea freight containers at either the OSRL bases or at the logistics provider's yard.

Air – SLA equipment pallets and items are ready to be loaded into an aircraft.

Road – SLA equipment pallets and items can be directly loaded onto a trailer or loaded into a shipping container if needed for road transport.

2.4 General Considerations

OSRL equipment will be mobilised from the most appropriate base depending on the location of the incident. In most circumstances the equipment will be mobilised by air, using either chartered cargo aircraft or scheduled flights. Unless the WO / IO wishes to arrange their own transport, OSRL will deliver SLA equipment to the point of entry of the required country.

The majority of OSRL's SLA at-sea equipment is not housed in DNV 2.7.1 containers, if at-sea certification is required then containers or baskets must be supplied by the WO / IO and welding may be required prior to loading onto vessels.

The WO / IO's responsibility will be to arrange for customs clearance at the destination border crossing and onward transport to the deployment or storage locations. Once in country, responsibility for the equipment insurance will pass to the WO / IO.

The following should be considered when mobilising any of the equipment packages:

- Which are the nearest OSRL Base locations to the incident area?
- What is the time and risk differential between mobilisation by air, mobilisation by sea or mobilisation by road?
- Any lead time to mobilise the required vehicles / vessels / aircraft to the storage location?
- What are the local documentation requirements for customs and other in country agencies (i.e. packing lists, pro-forma invoices, fumigation certificates, certificates of origin, cargo tracking notes or translations etc.)?
- Are load plans, lift plans, transportation plans, vehicles, cranes etc. in place for the transportation of the equipment by air, sea, and road in the incident country?
- What information needs to be communicated to in country authorities (i.e. customs agencies, national police and environment agencies) regarding the arrival of the response equipment?
- Are there robust procedures in place for tax/importation/temporary importation fees?
- Are there WO / IO representatives available at the receiving airport of disembarkation (APOD)/ seaport of disembarkation (SPOD)?

Service Level Agreement Equipment is purchased and packaged so that it is easily mobilised using the most likely mode of transport for many scenarios allowing for the fastest response possible. Most of the equipment is packed in intermodal units which allow for ease of transport by road, sea or air. For specific package sizes and maximum weights and dimensions please see ANNEX B.

2.5 Mobilisation protocols

If the SLA equipment is required, OSRL will ensure that the requested items are transported to the NDP as requested by the WO / IO. NDP will be dependant on the WO / IO's membership with OSRL.

2.6 Task completed by OSRL for all equipment during a mobilisation

If requested by the WO / IO, OSRL will ensure that the required equipment is mobilised to the nominated delivery point (NDP), which may be either an airport of embarkation (APOE) or seaport of embarkation (SPOE) as agreed with the WO / IO. Upon notification from a WO / IO, OSRL will start working with our cargo charter brokers to identify suitable methods to mobilise the required equipment from the OSRL bases to the NDP. Any costs and routings will be confirmed with the WO / IO in writing prior to the mobilisation commencing.

A standby hire rate will be applicable for all equipment mobilised from the time it leaves the relevant OSRL base, rates will be charged for standby or in use equipment as documented in the published Scale of Fees.

OSRL will:

- Provide a focal point to support the WO / IO and any on-going operations 24/7
- Supply the shipping and customs documentation as required for the incident destination whether by road, sea or air from all OSRL bases
- Arrange transport as approved by the WO / IO to the nominated seaport / airport
- If required, provide transport routes, timings and costs
- Export customs clear the equipment out of its departure country
- Ensure all loads are fit for transit method to be used including all lashing and securing of equipment into containers and skids

2.7 Documentation

OSRL will prepare the following documentation (in English) as part of standard procedures:

- Packing lists
- Pro-forma/Commercial/Customs invoices as required
- Load summary
- Dangerous Goods Declaration
- Safety Data Sheets (SDS)
- Commercial Invoices

If Certificates of Origin or any translations are required, they can be applied for by OSRL however this will cause delays to the process.

It is the WO / IO's responsibility to provide OSRL with the following information to export the equipment:

- Consignee details (name, contact number and address of the site)
- Notifying party (Logistics company supporting the shipment)
- Special in-country permit/customs procedures and requirements
- Translation requirements for provided documentation, according to destination country.
- If any country specific documentation is required, then the WO / IO should task their freight forwarders to work with the government agencies to see whether these requirements can be waived or avoided during an oil spill. Any requirement for extra documentation could delay the equipment's arrival in country.

2.8 Dangerous Goods

Information is key to any safety program, including for dangerous goods in air transport. Through its Dangerous Goods Regulations (DGR) and a comprehensive and effective training program, International Civil Aviation Organisation (ICAO) ensures that shippers, forwarders, and carriers have the tools and resources to ship dangerous goods safely.

Compliance with the DGR requires specific training. The successful application of regulations concerning the transport of dangerous goods greatly depends on the appreciation by all individuals concerned of the risks involved and on a detailed understanding of the regulations. This can only be achieved by properly planned initial and recurrent training programs.

Depending on each person's responsibilities, the training must be in line with the scope of the applicable staff category. Sub-Section 1.5 of the International Air Transport Association (IATA) DGR provides clear guidance on the quality and content of DGR trained personnel.

All equipment has been checked against compliance with the below regulations:

- **ICAO -** International Civil Aviation Organisation Technical Instructions for the Safe Transport of Dangerous Goods by Air.
- **IATA DGR -** International Air Transport Association Dangerous Goods Regulations
- **ADR -** European Agreement concerning the International Carriage of Dangerous Goods by Road
- **IMDG Code -** International Maritime Dangerous Goods Code

The completion of the Dangerous Goods Note (DGN) is the responsibility of OSRL and OSRL's third party logistics provider.

Table 1: Dangerous goods in SLA

Item	Description	Conclusion	Remark

Item 1	Helium Cyllinders	**UN 1046** Helium, Compressed	Packed in pressurised cylinders to be deployed alongside the Aerostat
Item 2	Pumps, Power Packs, Petrol and Diesel Powered Machinery	**UN 3528** Machinery, Internal Combustion, Flammable Liquid Powered	Drained of fuel to be shipped as non haz for IMDG Code, and compliance with regulations for IATA DGR (dependant on fuel type)
Item 3	Engine Batteries	**UN 2794** Batteries, Wet, Filled with Acid	To accompany the UN 3528 machinery. Exempted from declaration if UN 3528 is declared
Item 4	Terrain vehicles / small boats with integrated motors	**UN 3166** Vehicle, Flammable Liquid Powered	Standalone cargo such as ATVs
Item 5	Life jackets / Life rafts	**UN 2990** Life Saving Appliances, Self-Inflating	Accompanies the responder when travelling. Falls under regulations if shipped in bulk.
Item 6	Hoyle lights / stopwatches	**UN 3091** Lithium Metal Batteries Contained In Equipment	Mainly accompanies the responder when travelling
Item 7	Spare lithium metal batteries	**UN 3091** Lithium Metal Batteries Packed with Equipment	Accompanies the UN 3091 equipment
Item 8	Laptops / gas monitors / communications equipment / Aerostat	**UN 3481** Lithium Ion Batteries Contained In Equipment	Mainly accompanies the responder when travelling
Item 9	Spare lithium ion batteries	**UN 3481** Lithium Ion Batteries Packed with Equipment	Accompanies the UN 3481 equipment
Item 10	Particulate monitors	**UN 3496** Batteries, Nickle Metal Hydride	Not regulated

2.9 Safety Data Sheet

SDSs will be provided as appropriate. SDS (also referred to in the past as Material Safety Datasheets (MSDSs) or Product Safety Datasheets (PSDSs)) are a vital component of product stewardship and occupational health and safety. It is intended to provide workers and emergency personnel with procedures for handling or working with that substance in a safe manner, and include information such as:

- Physical and chemical data (e.g., melting point, boiling point, flash point etc.)
- Toxicity / Toxicological information
- Health effects
- First aid
- Reactivity
- Storage
- Disposal
- Transport
- Protective equipment
- Spill handling procedures

The SDS follows a 16-section format which is internationally agreed.

SDS for dispersant will be supplied with any dispersant mobilisation.

2.10 Mobilisation times

It should be noted that due to the variations along the entire response chain for any equipment, it is extremely difficult to provide accurate mobilisation times. SLA equipment is stored in a response ready configuration suitable for common transport to ensure a time efficient response via all modes of transport.

OSRL would encourage early mobilisation of equipment to allow the most efficient options for transport to be considered.

2.10.1 Air mobilisation

SLA equipment is stored in air freight pallets or as a standalone unit and is designed to be loaded into most cargo aircraft. It is suitable for quick loading onto Unit Load Devices at the APOE if required. APOEs are in close proximity of the base locations and have been pre-identified with the OSRL charter brokers. When notified of a spill or potential spill, we will work with our brokers to find the fastest and most effective methods of mobilising our equipment to the required APOE.

2.10.2 Sea mobilisation

SLA equipment is all deployable by sea if it is the most appropriate method of response, all OSRL response bases are within close vicinity of major seaports where the WO / IO could send vessels for loading if required. Mobilising equipment by sea is likely to have a much slower response time but could be required in certain situations, particularly if the incident is relatively near an SLA base.

2.10.3 Road mobilisation

SLA equipment is all deployable by road depending on the spill location and mobilising base. In some situations, this may be quicker and more cost effective than using sea or air mobilisations.

All the OSRL SLA bases have hauliers available should road freight be the most effective method of response.

2.11 Customs procedures

Although there is a drive to harmonise global customs procedures, there are significant regional variations. The WO / IO should ensure that care and attention is paid to this part of any well response planning process, specifically the customs requirements for each country and territory that each shipment will pass through, whether by road, sea and / or air.

3 SLA Equipment Transportation

3.1 Transport considerations

Attention must be paid to mobilisation method be it sea, air, or road. Each method of transport will have its own benefits and restrictions, which should be fully evaluated and understood by the WO / IO.

Given the quantity of equipment to transported for a major SLA mobilisation, there needs to be considerations into the transportation methods and resources required. These include laydown areas, vessels / aircraft / trucks and any personnel representatives required throughout this process.

3.2 Shipping configurations

Attention must be paid to shipping configurations for road, sea and / or air. Each method of transport will have its own benefits and restrictions, these are to be fully evaluated and understood by the WO / IO. A combination of transport assets may be used, to allow for the rapid deployment of operational equipment and ancillaries.

Additional attention must be given to the following tasks to assure the necessary sequential delivery of components to the mobilisation areas:

- Desired order of packing / unpacking depending on the desired delivery sequence
- Loading of containers
- Dunnage
- Lashings
- Accumulative weight totals

3.3 Desired order of dispatch and arrival

Attention should be paid to the desired order of arrival of SLA equipment at the WO / IO forward operating base / laydown area. Consideration at an early stage in the planning process will allow the same equipment to be dispatched in a considered and logical order. The WO / IO should also remember that the mobilisation of SLA equipment may not be carried out in isolation and that additional services from OSRL, such as the Global Dispersant Stockpile (GDS), Subsea Well Intervention Service (SWIS) and aviation assets may also have to be considered, when it comes to the desired order of arrival, in any all-encompassing emergency response plan.

3.4 Aircraft

It is the responsibility of the WO / IO to organise and charter all cargo aircraft for equipment mobilisation. It is strongly advised that pre-existing agreements are in place with suitable freight forwarding companies. Aircraft selection will be influenced by several factors:

- Regional location (Europe, Middle East & Africa (EMEA), Asia-Pacific (APAC), and the Americas)
- APOE
- APOD
- Aircraft availability
- Ground handling restrictions

All items of the SLA equipment, with the exception of the Egmopol Barge (See equipment detail in Annex B), are loadable into a Boeing 747- 400F. However, it is important to consider that Boeing 747's cannot be accepted by all airports. Specific aircraft availability and airport capabilities will be assessed at the time of a mobilisation to ensure that the best mobilisation option is selected based on the incident location. European / Worldwide noise and pollution constraints mean that aircraft selection may be limited.All aircraft loading will be subject to individual aircraft operator guidelines, loadmaster requirements and aircraft weight and balance rules.

All aircraft loading will be subject to individual aircraft operator guidelines, loadmaster requirements and aircraft weight and balance rules.

3.5 Distance, range and time information - Air

There are various issues that can affect the timing for a mobilisation by air; examples of these include (all arranged by aircraft broker):

- Identification of aircraft
- Aircraft relocation
- Maximum working hours
- Clearances / landing rights
- Crew rotation / rest
- Refuelling stops
- Over-flight and landing rights

The following assumptions have been made; that typical mission rules apply; airways and traffic allowances are included and a median of 85% annual winds. Maximum Take-off Weight (MTOW) is assessed as 875,000lbs (396,893kg). **Figure 5**, **Figure 6**, and **Figure 7** highlights the range of 747-400F freight aircraft from London, Singapore and Miami.

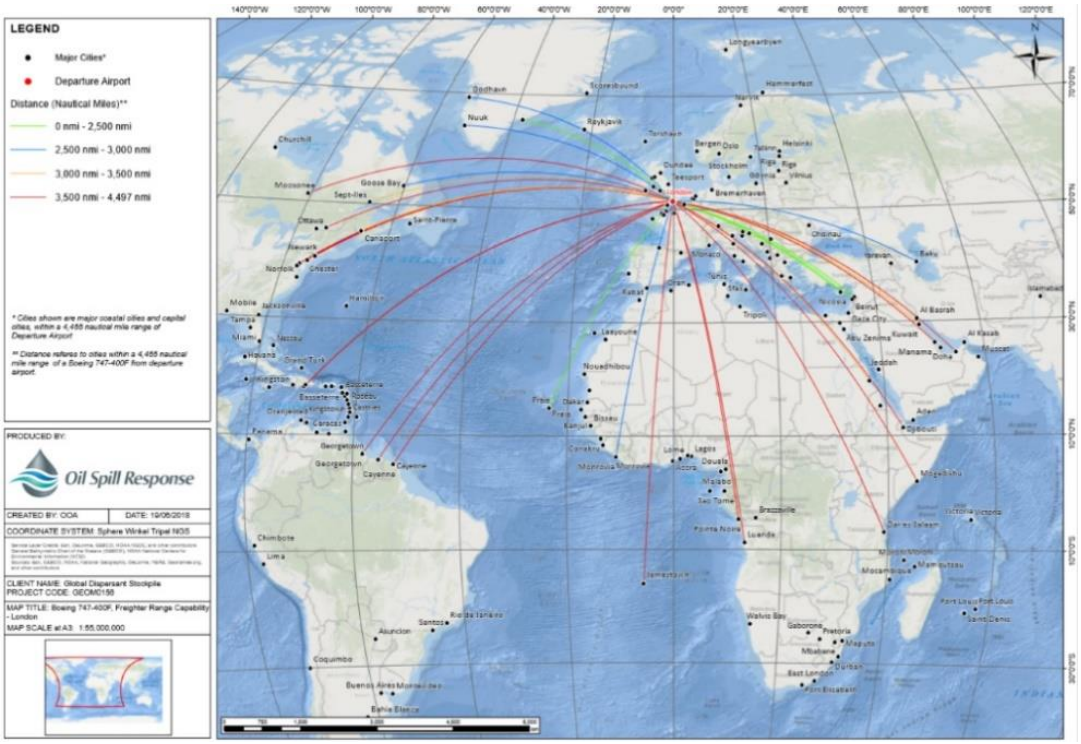


Figure 5: B747-400F freighter range capability from LONDON, UK

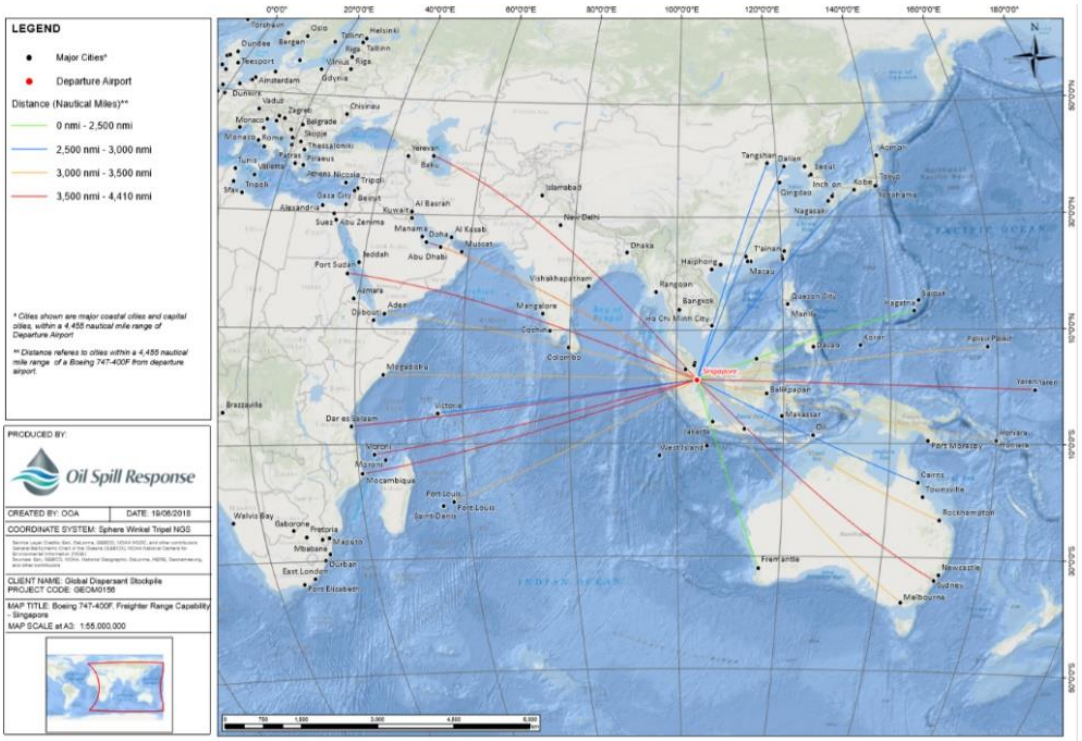


Figure 6: B747-400F freighter range capability from SINGAPORE, SINGAPORE

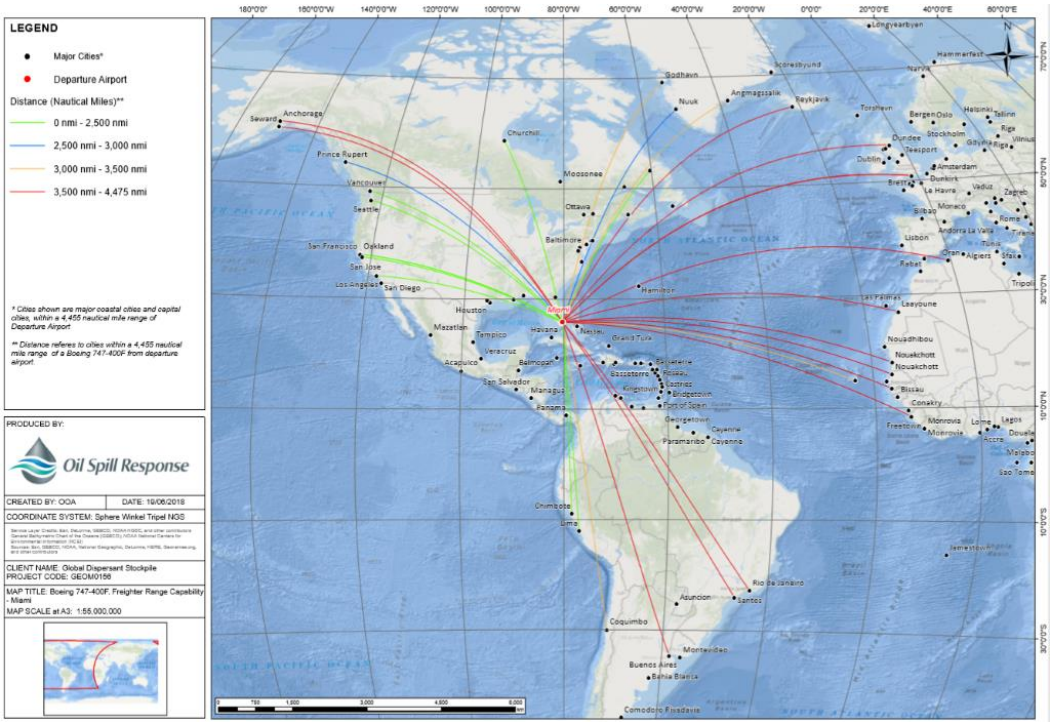


Figure 7: B747-400F freighter range capability from MIAMI, USA

3.6 Air deployment considerations

The following should be considered when mobilising by air:

- Does the WO / IO have internal procedures enabling the charter of suitable aircraft and associated cargo handlers at both the APOE and APOD?
- On site representative(s) are present to oversee the equipment prior to loading any chartered aircraft
- Does the APOD have the required resources and infrastructure i.e., Main Deck Loaders (MDL) able to unload a B747F) with appropriate capacity or enough area available for cranes to transfer equipment to transportation vehicles? An MDL will be required if the equipment was flown in B747F
- Can the APOD allow take off / landing of the chartered aircraft (noise regulations, runway specification, slot availability etc.)?
- Are special permits required to allow the landing of the chartered aircraft?
- Will refuelling stops be necessary due to the distance and aircraft payload?
- Airport altitude and temperature (hot and high) may impact maximum aircraft payload
- Are re-fuelling facilities available at transit airports en route and at the APOD?
- Notice period required for aircraft availability is dependent upon aircraft movements and can take several days if there is a demand for a specific craft. Availability can be

significantly reduced by a large-scale humanitarian incident which requires international aid

- Capability of handling equipment at destination would depend upon pre-arrangement and regular follow-up. All countries have one or more designated airport for entry and exit. Choice would depend on factors such as client requirements, runway needs and suitable handling facilities

3.6.1 Liquid cargo

Operators of Boeing manufactured aircraft are subject to Boeing recommended operating practices for restricting the carriage of bulk liquids, such as IBC containers without baffles, to a specific percentage of the maximum payload for the aircraft type. This is a recommendation from Boeing in order to prevent excessive 'sloshing' of liquid during flight (especially in turbulence) which it is thought can cause the aircraft to become unstable and increase the fatigue level of the flight crew.

The safety restriction covers all models of Boeing aircraft, refer to the Boeing Service Letter found in 0. The safety restriction recommends restricting liquid loading to 42% of the aircraft max payload. In the case of the B747-400F (max payload 120,000kgs/264,554lbs) this would mean a maximum payload of liquid cargo of 50,400kgs/111,112lbs. Where 1100kgs/2,425lbs IBCs are being used, this means a total of 45x IBCs per flight. In this situation, the rest of the aircraft can be loaded with other non-liquid cargo up to the maximum payload of the aircraft. B747 converted freighters have a lower max payload and hence the maximum IBC count is 42x. **It should be noted that not all Boeing carriers follow this recommendation and there are known carriers at this time who will carry a full 100% load of liquid cargo.**

3.7 Aircraft types

There are several types of cargo aircraft that can be used for transporting the SLA equipment. Details of each aircraft and their capabilities can be found below. Please consider the descriptions as guidance and not as authoritative information.

Ilyushin IL-76TD-90VD:

The IL-76TD-90VD is a medium size cargo aircraft with the following capabilities:

- Rear loading ramp
- On board cranes and cargo handling equipment
- Self-loading and discharge capabilities suitable for the transportation of the following:
- Military cargo
- Heavy machinery
- Oversize equipment
- Oil and gas equipment

- Aerospace industry equipment and satellites
- Aid, relief, and peacekeeping cargo
- Maximum gross payload 46,000kg
- Range (maximum payload) 4530km

Antonov AN124, (Models 100 and 150):

The Antonov AN124 is a heavy cargo aircraft with the following capabilities:

- Front and rear loading ramps
- On board cranes and cargo handling equipment
- Self-loading and discharge capabilities, suitable for the transportation of the following:
- Military cargo
- Heavy machinery
- Oversize equipment
- Oil and gas equipment
- Aerospace industry equipment and satellites
- Aid, relief, and peacekeeping cargo
- Maximum gross payload 150,000kg
- Range (maximum payload) 5000km

Boeing B747F:

The Boeing B747F (Freighter) is a heavy cargo aircraft with the following capabilities:

- Nose door and large side cargo door
- Belly freight
- Main cargo deck with 29 pallet positions (largest palletised cargo aircraft)
- Pressurised cargo cabin suitable for freight all kinds
- Temperature control range from 4 to 30°C
- Roller bed systems
- Suitable for the transportation of the following:
- Heavy machinery
- Oversize equipment
- Oil and gas equipment
- Maximum gross payload 112,630kg
- Range (maximum payload) 8230km

Note: Unlike the AN124 and Ilyushin IL76, the B747F does not have the on-board capabilities of loading and offloading itself. To load and offload a B747F the airport ground handling crew will need to have

an adequate MDL. Most international airports globally have the equipment needed to offload this aircraft, but the range of weight capacity varies between 7 metric tons and 35 metric tons.

3.8 Sea fastening

Any sea-fastening procedures will be the responsibility of the vessel crew. Some equipment may require either directly welding or the welding of mounting points to the deck of a vessel for safe operation at-sea.

3.9 Vessel deployment considerations

In some cases, the WO / IO may want SLA equipment to be loaded directly on a deployment vessel at the storage location country. Therefore, equipment trucking to a suitable quayside may be arranged for such a scenario. The following should be considered:

- Does the vessel identified to collect the equipment have a suitable onboard crane capable of lifting equipment from the quayside or to deploy the equipment? What are their lifting radii and Safe Working Load (SWL)?
- Does the vessel identified have suitable space to accommodate the SLA equipment and all ancillaries?
- Is the vessel identified to collect the equipment capable of deploying it at the incident location?
- Will the equipment require transferring from the vessel of collection to a vessel of deployment?
- What is the crane capacity and maximum unit shipping weight if ship to ship or ship to shore transfer is required?

3.10 Tasks and resources required by the WO / IO

Should the WO / IO require SLA equipment to be loaded directly on a deployment vessel, the following tasks must be considered:

- Charter the vessels and associated ships' agent
- Ensure all vessel / port / state clearances are gained
- On site representative(s) are present to oversee the equipment prior to loading any chartered vessels

3.11 Distance information – vessel

Table 2: Vessel sailing distances

Sailing distance in NM	Stavanger (NO SVG)	Bergen (NO BGO)	Aberdeen (GB ABD)	Falmouth (GB FAL)	Rotterdam (NL RTM)	Lisbon (PT LIS)	Dakar (SN DKR)	Las Palmas (ES LPA)	Houston (US HOU)	Rio de Janeiro (BR RIO)	Lagos (NG LOS)	Luanda (AO LAD)	Cape Town (ZA CPT)	Singapore (SG SIN)	Fremantle (AU FRE)
Stavanger (NO SVG)	0	89	280	767	439	1450	2931	2112	4879	5605	4533	5301	6515	8632*	9989*
Bergen (NO BGO)	89	0	302	835	513	1518	2999	2180	4858	5669	4601	5369	6583	8701*	10058*
Aberdeen (GB ABD)	280	302	0	656	388	1338	2819	2001	4707	5493	4422	5189	6404	8521*	9878*
Falmouth (GB FAL)	767	835	656	0	392	746	2227	1409	4584	4895	3829	4597	5812	7929*	9286*
Rotterdam (NL RTM)	439	513	388	392	0	1074	2555	1736	4966	5229	4157	4925	6139	8257*	9614*
Lisbon (PT LIS)	1450	1518	1338	746	1074	0	1525	710	4501	4217	3128	3895	5110	7207*	8564*
Dakar (SN DKR)	2931	2999	2819	2227	2555	1525	0	821	4447	2758	1602	2369	3584	8400*	8320
Las Palmas (ES LPA)	2112	2180	2001	1409	1736	710	821	0	4325	3509	2424	3191	4406	7614*	8971*
Houston (US HOU)	4879	4858	4707	4584	4966	4501	4447	4325	0	5279	5937	6693	7500	11630*	10947**
Rio de Janeiro (BR RIO)	5605	5669	5493	4895	5229	4217	2758	3509	5279	0	3294	3370	3290	8818	7882
Lagos (NG LOS)	4533	4601	4422	3829	4157	3128	1602	2424	5937	3294	0	1097	2583	8168	7323
Luanda (AO LAD)	5301	5369	5189	4597	4925	3895	2369	3191	6693	3370	1097	0	1599	7184	6339
Cape Town (ZA CPT)	6515	6583	6404	5812	6139	5110	3584	4406	7500	3290	2583	1599	0	5589	4743
Singapore (SG SIN)	8632*	8701*	8521*	7929*	8257*	7207*	8400*	7614*	11630*	8818	8168	7184	5589	0	2160
Fremantle (AU FRE)	9989*	10058*	9878*	9286*	9614*	8564*	8320	8971*	10947**	7882	7323	6339	4743	2160	0

* = via Suez Canal

**= via Panama Canal

All information extracted from Port World (http://www.portworld.com/map/)

3.12 Transportation by road

If mobilising by air, OSRL will transport the SLA equipment from the storage site to the APOE by truck. The number of truckloads required for SLA equipment will depend on type and quantity of equipment agreed to be sent. It is strongly advised that the WO / IO have pre-existing agreements are in place with suitable freight forwarding companies to accept the equipment.

Weights and dimensions of the SLA equipment in its road transport configuration will depend on the items being sen, and loading configurations will be up to the discretion of the truck driver. Attention must be paid as well to the following as appropriate:

- Overhead clearance
- Weight limits
- Load lashings
- Local transport restrictions and regulations

3.13 Third Party Logistics

The use of 3PL is often necessary and essential to the success of logistic operations. 3PL traditionally provide one or more specialist functions, for example:

- Transport
- Heavy lift
- Warehousing

- Materials handling equipment

Comprehensive, mutually understood, and proven call-off procedures or an enabling contract, including development of mobilisation scenarios and drill participation, should be put in place by member companies to ensure that required specialist capabilities provided by a 3PL are readily available.

3.14 Consignment tracking information

Consignment tracking is the process, procedures and associated technology used to give both the consignor and consignee visibility of items in transit, whether in real time or at last known location. Visibility of items in transit is crucial for pragmatic operational planning and execution. Knowing where items in transit are and when they will be available for use at the required location, including expected arrival date and time, helps ensure the efficient and effective co-ordination of available resources to maximise operational capability.

Tracking of items in transit is achieved by:

- The reporting of the arrival or departure of the item
- Recording the following:
- Identification of the item
- Location observed
- Time and date

This process can be electronic, manual, and electronic, or entirely manual, depending on the location and availability of consignment tracking information systems and WO / IO's own installed systems. Visibility of items in transit for second and third parties will be achieved by the interrogation of consignment tracking systems using the unique consignment identification number.

3.15 Mobilisation by sea

Find in **Figure 8** a diagram of OSRL's and the WO / IO's responsibilities during the mobilisation process by sea. **Table** 3 shows a breakdown of responsibilities depending on tasks to be completed during the mobilisation process.

Property of Oil Spill Response	Document Title	Document Number
OSRL	LOGISTICS PLANNING GUIDE (LPG) SERVICE LEVEL AGREEMENT (SLA)	OSRL-OPER-GUI-00705
		Revision: 3

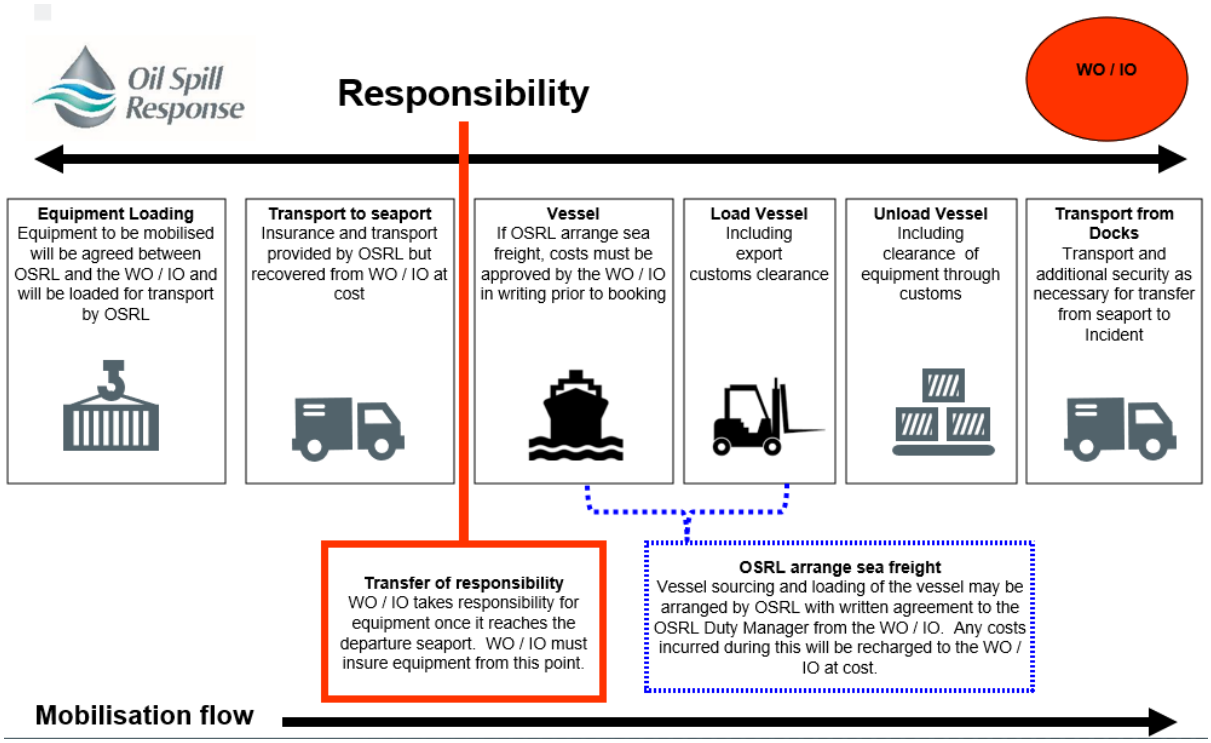


Figure 8: OSRL's and WO / IO's lines of responsibilities = mobilisation by sea

Table 3: Breakdown of Responsibilities (Deployment by Sea)

Task	Responsibility	Cost incurred by	Resources required	Service providers required	Service provider mobilized by
Selection of Required Equipment	OSRL and WO / IO	OSRL (Charged to WO / IO)	Personnel	None	N/A
Load Equipment for Transport to Seaport	OSRL/OSRL Contractors	OSRL (Charged to WO / IO)	Road Haulage, Forklift	Warehouse Contractors/Road Haulage Company	OSRL
Charter Vessel	OSRL and WO / IO	WO / IO	Vessel Charter	Vessel Charter Provider	OSRL / WO / IO
Mobilise Cargo Handlers	OSRL and WO / IO	WO / IO	Handlers	Cargo Handling Agent	OSRL / WO / IO
Pass Equipment to Cargo Handlers	OSRL/OSRL Contractors	OSRL (Charged to WO / IO)	Handlers/OSRL Contractors	Cargo Handling Agent	OSRL / WO / IO
Load Vessel	Cargo Handlers	WO / IO	Handlers	Cargo Handling Agent	OSRL / WO / IO

Task	Responsibility	Cost incurred by	Resources required	Service providers required	Service provider mobilized by
Export Customs Clearances	OSRL	OSRL (Charged to WO / IO)	Personnel	Customs Agent	OSRL / WO / IO
Unload Vessel	Cargo Handlers	WO / IO	Handlers	Cargo Handling Agent	OSRL / WO / IO
Import Customs Clearances	WO / IO	WO / IO	Personnel	Customs Agent	WO / IO
Transport from Seaport	WO / IO	WO / IO	Road Haulage, Forklift	Road Haulage Company	WO / IO

3.16 Mobilisation by air

Find in **Figure** 9 a diagram of OSRL's and the WO / IO's responsibilities during the mobilisation process by air. **Table** 4 shows a breakdown of responsibilities depending on tasks to be completed during the mobilisation process.

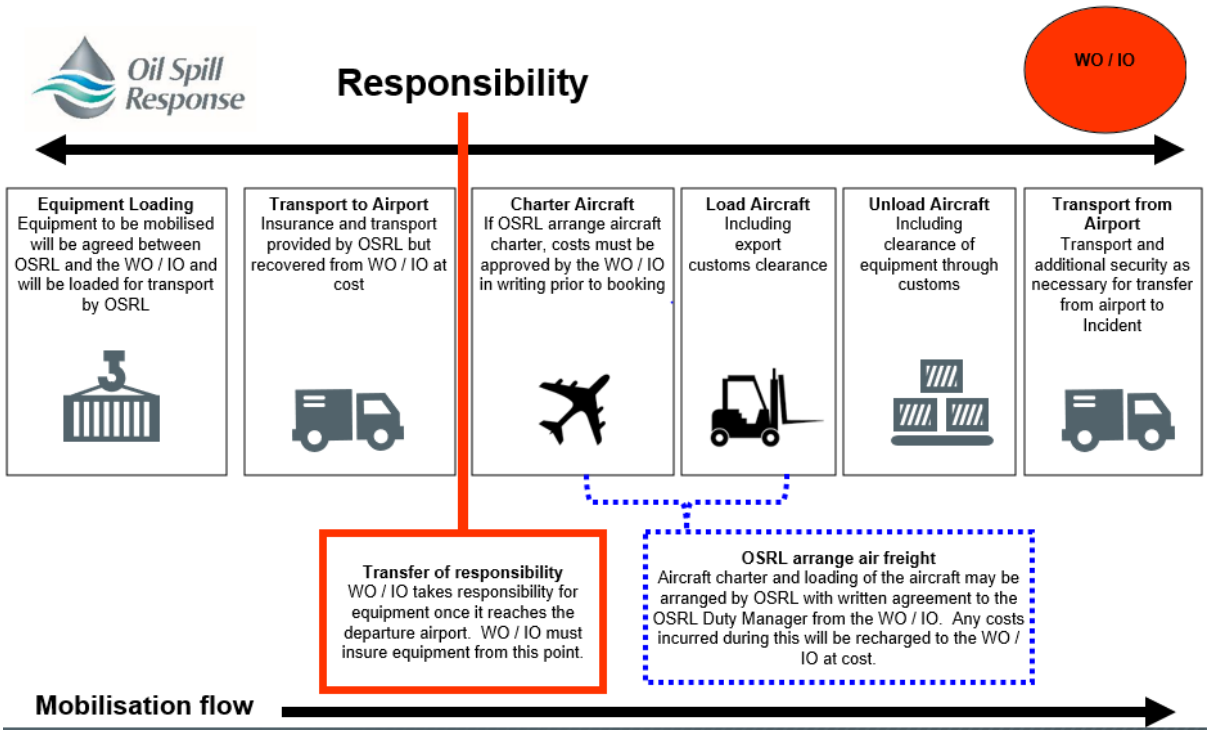


Figure 9: OSRL's and WO / IO's lines of responsibilities = mobilisation by air

Table 4: Breakdown of Responsibilities (Deployment by Air)

Task	Responsibility	Cost incurred by	Resources required	Service providers required	Service provider mobilized by
Selection of Required Equipment	OSRL and WO / IO	OSRL (Charged to WO / IO)	Personnel	None	N/A
Load Equipment for Transport to Airport	OSRL / OSRL Contractors	OSRL (Charged to WO / IO)	Road Haulage, Forklift	Road Haulage Company	OSRL
Charter aircraft	OSRL and WO / IO	WO / IO	Aircraft Charter	Aircraft Charter Provider	OSRL / WO / IO
Mobilise Cargo Handlers	OSRL and WO / IO	WO / IO	Handlers, MDL's etc.	Cargo Handling Agent	OSRL / WO / IO
Pass Equipment to Cargo Handlers	OSRL	OSRL (Charged to WO / IO)	Handlers	Cargo Handling Agent	OSRL / WO / IO
Load Aircraft	Cargo Handlers	WO / IO	Handlers, MDL's etc.	Cargo Handling Agent	OSRL / WO / IO
Export Customs Clearances	OSRL	OSRL (Charged to WO / IO)	Personnel	Customs Agent	OSRL / WO / IO
Unload Aircraft	Cargo Handlers	WO / IO	Handlers, MDL's etc	Cargo Handling Agent	OSRL / WO / IO
Import Customs Clearances	WO / IO	WO / IO	Personnel	Customs Agent	WO / IO
Transport from Airport	WO / IO	WO / IO	Road Haulage, Forklift	Road Haulage Company	WO / IO

3.17 Mobilisation by road

Find in **Figure 10** a diagram of OSRL's and the WO / IO's responsibilities during the mobilisation process by road. **Table 5** shows a breakdown of responsibilities depending on tasks to be completed during the mobilisation process.

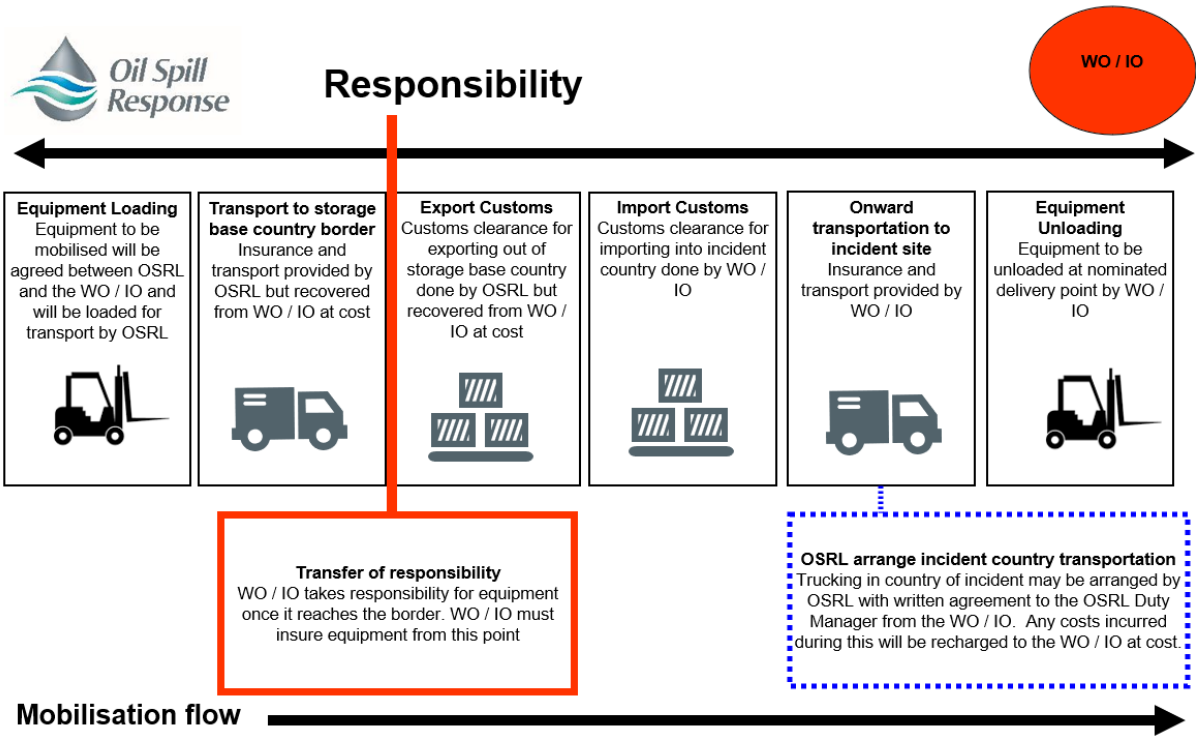


Figure 10: OSRL's and WO / IO's lines of responsibilities = mobilisation by road

Table 5: Breakdown of Responsibilities (Deployment by Road)

Task	Responsibility	Cost incurred by	Resources required	Service providers required	Service provider mobilized by
Selection of Required Equipment	OSRL and WO / IO	OSRL (Charged to WO / IO)	Personnel	None	N/A
Load Equipment for Transport	OSRL / OSRL Contractors	OSRL (Charged to WO / IO)	Road Haulage, Forklift	Road Haulage Company	OSRL
Export Customs Clearances	OSRL	OSRL (Charged to WO / IO)	Personnel	Customs Agent	OSRL / WO / IO
Import Customs Clearances	WO / IO	WO / IO	Personnel	Customs Agent	WO / IO

3.18 Mobilisation laydown and staging areas

SLA equipment will require three different types of lay down areas depending on the kind of response.

An aerial dispersant response will require a storage area at the deployment airport, preferably with a bunded area for dispersant storage and air side wherever possible.

An at-sea response will require a dockside lay down area along with mooring areas and cranes to allow loading of equipment on to support vessels. Preferably this area will have some covered storage to protect equipment prior to containerisation or loading.

A shoreline response will require a lay down area for breaking down equipment into smaller packages for loading and distribution to nearby shoreline areas. This will require good road access to allow delivery and redistribution of equipment.

All these areas will require forklift availability for offloading, dispersant requires a forklift with a weight limit of at least 1.5 tonnes, shoreline responses will require a forklift with a capacity of at least 2 tonnes and an at-sea response will require cranes and/or forklifts with a capacity of at least 6 tonnes.

It is the WO/IO's responsibility to keep all the equipment in secured areas.

4 Equipment

4.1 Fifty percent equipment deployment

Any member is entitled to request 50% of the equipment by type available at the time of the request from the OSRL's global stockpile; this would be a large logistical exercise with multiple aircraft arrivals which would need to be carefully managed at the arrival airport. It is recommended that WO / IO's logistics teams or freight forwarders are aware of the potential size of mobilization and are aware of what would be required of them in this situation.

To give a rough guide, a sample fifty percent load list showed a total of 851 packages with a total weight of 809 tonnes.

The delivery of this much equipment to a destination airport is likely to require full loads in 10-15 Boeing 747 aircraft (where suitable) and will need 40-50 40ft heavy goods vehicles (HGV) for onward distribution from the airport.

4.2 Aerial dispersant deployment

Aerial dispersant operations will primarily be operated from aircraft with fitted dispersant spraying systems (Tersus System - developed for the OSRL 727-2S2F(RE) aircraft and RIDSS – developed for the Hercules aircraft). The Tersus System is approved by the European Union Aviation Safety Agency to carry out missions for flight in known icing conditions.

OSRL owns three retrofit systems as well (ADDS packs) designed for transport and installation in Hercules L382G aircraft. Where possible the retrofitted systems will be fitted in the departure country rather than being freighted separately.

To support aerial dispersant operations the OSRL SLA bases hold between them 700m^3 of dispersant. An OSRL member 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 SLA dispersant stocks.

4.3 Dispersant deployment

OSRL Dispersant is stored primarily in 1000ltr IBC's, these are easily transportable through all modes of transport.

Table 6**:** Dispersant Details

Equipment		Storage Location	Weights (Kg)	Dimensions (m) *(Largest item)*
Dispersant	IBC	All bases	940 – 1100	1.2 x 1.1 x 1.0

4.4 At-sea equipment deployment

The key parts of equipment for an at-sea deployment are normally the at-sea oil collection booms, these are generally the largest pieces of equipment. These booms will need to be transported along with an at-sea skimmer, power pack and hose reel as detailed below.

Other items of note from the at-sea equipment are the Octopus high volume skimmer which is packaged on a 20ft DNV 2.7.3 Flat rack container, Fire booms, and Current Buster 6 which are on large reels so require careful aircraft selection for mobilisation.

As a minimum for an at-sea spill we would expect to be mobilising at least two offshore booms, two at-sea skimmer pallets, hydraulic power packs and two hydraulic hose reels. This would require 1 to 2 forty-foot trailers for onward distribution.

Fifty percent of the at-sea stockpile mobilisation may represent around 20 forty-foot trailers worth of equipment equivalent to around six full Boeing 747 aircraft.

Table 7**:** At-Sea Equipment Details

Equipment		Storage Location	Weights (Kg)	Dimensions (m) *(Largest item)*
Ro-boom 1500	On reel	UK, Singapore, USA and Bahrain	1500-4290	2.7 x 2 x 1.8
Hi-Sprint 1500	On reel	UK, Singapore, USA and Bahrain	4100	2.7 x 2 x 2.3
Current Buster 6	On reel	UK, Singapore, USA and Bahrain	4200	3.3 x 2.5 x 2.7
Octopus skimmer	On 20ft DNV 2.7.3 Flat rack	UK and Singapore	8100	6 x 2.4 x 2.6
At-sea skimmers	Airline pallets/ self-contained	UK, Singapore, USA and Bahrain	200 - 700	2 x 1.5 x 1
At-sea storage	Airline pallets	UK, Singapore, USA and Bahrain	400 – 650	2 x 1.5 x 1
Fire booms	On reel and self-contained	UK, Singapore and USA	3500	3.1 x 2.3 x 2.7
Power packs	Self-contained	UK, Singapore, USA and Bahrain	30-2000	2 x 1.5 x 1
Hydraulic hoses	Hose reels	UK, Singapore, USA and Bahrain	620	1.8 x 1 x 1.7
Dispersant intermediate bulk containers	Dispersant	UK, Singapore, USA and Bahrain	950-1050	1.2 x 1 x 1.1

(IBC's)				
Dispersant boat spray systems	Airline pallets	UK, Singapore, USA and Bahrain	400	2 x 1.5 x 1

4.5 Shoreline equipment deployment

The key shoreline response equipment held by OSRL are primarily stored in aircraft ready pallets. Each pallet of shoreline / nearshore boom contains between 80 and 160 metres of boom. The boom would then need to be supported with shoreline skimmers, waste storage and personnel protective equipment as a minimum. On this basis the smallest package that we would expect to send would be around four aircraft pallets; these could be carried within an 18-tonne lorry.

If fifty percent of the OSRL shoreline response stockpile was requested, this would represent around 15 to 20 forty-foot trailers worth of equipment.

Table 8**:** Shoreline Equipment Details

Equipment		Storage Location	Weights (Kg)	Dimensions (m) *(Largest item)*
Shoreline boom	Airline pallets	All bases	500 – 1200	2 x 1.5 x 1
Shoreline skimmers	Airline pallets	All bases	400 – 800	2 x 1.5 x 1
Shoreline storage	Airline pallets	All bases	450 - 600	2 x 1.5 x 1
Egmopol barge	Self-contained	UK	4600	10.1 x 2 x 2.3
All-Terrain Vehicles	Self-contained	All bases	1200	3.1 x 1.3 x 1.4
Command pallets	Airline pallets	All bases	1600	3 x 1.95 x 2
Wildlife equipment	Airline pallets	All bases	520	2 x 1.5 x 1
Pressure washers	Self-contained	All bases	600	2 x 1.3 x 1.2
Fast response trailers *(Not air freight)*	Self-contained	All bases	3500	5.2 x 2.4 x 2.6

Inflatable boats	Self-contained Airline pallets	UK, Singapore and Bahrain	440	6.2 x 2.4 x 2
Bobcat utility vehicle	Self-contained	USA	2600	3.4 x 2 x 1.8

5 Reverse Logistics

In accordance with the OSRL Membership Agreement, it is the responsibility of the WO / IO to return deployed equipment in a condition that is safe for transport to OSRL at the required OSRL base. It is incumbent upon the WO / IO to facilitate this process.

6 Glossary

Logistics terminology used within the document is, where possible, universal. Where regional variations occur, the reader is to note. For the purposes of the context of the document the following simplified terms and abbreviations are used:

6.1.1 Terminology

Deployment – Move and bring into effective action, i.e. deploying stores and equipment to required destinations.

DNV 2.7.3 / DNV 2.7.1 – Standards for Offshore containers and lifting equipment, OSRL equipment referred to as DNV in this plan meets either DNV 2.7.1 (Offshore containers) or DNV 2.7.3 (Portable offshore units)

ISO Container/20 Foot Container/TEU – A standard (with some weight variances) shipping container. TEU = Twenty Foot Equivalent Unit (20ft container is 1 x TEU, a 40ft container is 2 x TEU)

Lead time - The period from when the item is ordered to when the item is delivered to, and received at, the final destination ready for use (technically Supply Lead Time). The understanding of lead times is a critical management component.

Logistics - Management and flow of resources between point of origin and point of consumption.

Maintenance - The process of preserving a condition in respect of equipment, associated items and other items in storage therefore ensuring items are fit for issue and subsequent use; including planned and unplanned activities.

Material Handling Equipment - Equipment that relates to the movement, storage, control and protection of materials, goods and products.

Mobilisation - Make something movable or capable of movement, i.e. making stores and equipment ready for deployment.

Recovery - Move items back from deployment location to home location.

Re-deployment - Items are available for use after recovery

Sustainment - The provision of personnel, logistic, and other support required to maintain and prolong operations until successful completion.

6.1.2 Abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road

APOD – Airport of Disembarkation

APOE – Airport of Embarkation

DGR – Dangerous Goods Regulations

GDS – Global Dispersant Stockpile

GHS – United Nation's Global Harmonised System

IATA – International Air Transport Association

IBC – Intermediate Bulk Container

ICAO – International Civil Aviation Organisation

LPG – Logistics Planning Guide

MDL – Main Deck Loader

NDP – Nominated Delivery Point

SDS – Safety Data Sheet

OSRL – Oil Spill Response Limited

SDS – Safety Data Sheet

SPOD – Seaport of Disembarkation

SPOE – Seaport of Embarkation

SWIS – Subsea Well Intervention Service

WO / IO - Well Owner / Incident Owner

7 Reference documents

The below table identifies the documents to assist the mobilising party during a mobilisation (correct at time of printing).

Table 9: Supporting Documents for Mobilisation of SLA Equipment

Document no.	Document Title
OSRL-OPER-FOR-00172	Mobilisation Authorisation Form
OSRL-OPER-FOR-00173	OSRL Notification Form
OSRL-SW-PLA-00001	Global Dispersant Stockpile Logistics Planning Guide
OSRL-OPER-GUI-00192	B727 Mobilisation and Logistics Plan
OSRL-SCRG-GUI-00709	IAR Hercules C-130 Mobilisation and Logistics Plan

APPENDIX A: Service Level Agreement Storage Locations

United Kingdom

Lower William Street

Southampton

SO14 5QE

United Kingdom

Singapore

Loyang Offshore Supply Base

25C Loyang Crescent

(Block 503 TOPS Avenue 3)

Singapore 506818

USA

2381 Stirling Road

Ft Lauderdale

FL 33312 USA

Bahrain

Store 13, Building 3378,

Road 1546, Block 115,

Hidd

Kingdom of Bahrain

APPENDIX B: Equipment - Service Level Agreement

PLEASE NOTE: All weights are indicative and should not be used for freight purposes. Please request specific details if required from OSRL.

DISPERSANT

Dispersant is held at all SLA bases in varying quantities and from various manufacturers.

OSRL will work with the mobilising party and our logistics contractors to ensure that the required type of dispersant is mobilised from the best stockpile available.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Dispersant types held: Corexit 9500 Slickgone NS Enersperse 1100 Slickgone LTSW Super Dispersant-25 Slickgone EW Finasol OSR51 Corexit 9527 Enersperse 1583 Finasol OSR52	Weights: Vary from 940Kg – 1100Kg Dimensions: 1.2m x 1m x 1.1m

LOGISTICS VISUALISATION

TERSUS AERIAL DISPERSANT SYSTEM

The 727 Aerial dispersant System, Tersus, has been developed for the OSRL 727-2S2F(RE) aircraft, has seven tanks that hold 15,000 litres of dispersant. There are also pallets for the pump systems, which are pre-armed and recirculate the fluid so the system can begin spraying without delay. These systems can be controlled from the cockpit. Spray operations are performed at speeds of around 150 kt. and altitudes of 150 ft.

The 727 planes are located in Doncaster, UK.

EQUIPMENT	WEIGHTS AND DIMENSIONS
727 aerial dispersant system (holds 15m3 dispersant)	The system is permanently fitted in the aircraft, it's not freightable.

LOGISTICS VISUALISATION

AERIAL DISPERSANT DELIVERY SYSTEM (ADDS PACK)

The Airborne Dispersant Delivery System (ADDS) Pack is used for airborne and offshore dispersant spraying where a high treatment rate is required.
The type of dispersant suitable for airborne spraying must be a Type 3 dispersant.
The operations must be deployed from suitable aircraft, such as a modified Hercules aircraft.

EQUIPMENT	WEIGHTS AND DIMENSIONS
ADDS Pack Small Barrier Large Barrier	Tank 2100Kg (empty) - 9.1m x 2.3m x 2.35m Small barrier 440Kg – 1.66m x 1.51m x 1.02m Large Barrier 660Kg – 2.69m x 1.84m x 2.04m

LOGISTICS VISUALISATION

HELIBUCKETS

In addition to the large aerial dispersant application systems pre-packaged as loads, we also supply other dispersant application systems, including helicopter dispersant delivery system that can be used to spot treat oil slicks.

EQUIPMENT	WEIGHTS AND DIMENSIONS
TC3 Spray pods Simplex Heli spray buckets	TC3: 535Kg – 1.96m x 1.77m x 1.61m Simplex: 205Kg – 1.7m x 1.42m x 2.1m

LOGISTICS VISUALISATION

OFFSHORE BOOM AND ACTIVE BOOM

We have a variety of booms that can be used during an offshore incident; these booms are designed to concentrate the oil for recovery.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Ro-boom 1500 (200m) Hi-Sprint 1500 (300m) Ocean Boom 43" (305m) Ocean Boom 45" (274m) Nofi Current Buster 2 Nofi Current Buster 6 Norlense Boom	Ro-boom: 1500 – 4290Kg – 2.68m x 2.01m x 1.8m Hi-Sprint 1500: 4100Kg - 2.7m x 2.9m x 2.3m Ocean Boom: 2302Kg – 2.95m x 2.01m x 1.85m Ocean Boom: 2078Kg – 2.95m x 2.01m x 1.27m Current Buster 2 (Pallet): 900kg - 2.95m x 2.01m x 1.98m Current Buster 2 (Reel): 1464kg - 2.76m x 2.01m x 1.85m Current Buster 6: 4200kg – 3.25m x 2.45m x 2.7m Norlense Boom: 250Kg – 2.0m x 1.90m x 2.0m

LOGISTICS VISUALISATION



OCTOPUS SKIMMER

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 2.7.3) flat rack container with a built-in crane to enable easy and efficient mobilisation of the whole system.

EQUIPMENT	WEIGHTS AND DIMENSIONS
20ft DNV 2.7.3 Flat rack Support pallet Hose reel 1 Hose Reel 2 Lifting beam	Flat rack: 8100Kg – 6.03m x 2.41m x 2.6m Support pallet: 567Kg – 2m x 1.5m x 1m Hose reel 1: 860Kg – 1.81m x 1.3m x 1.9m Hose reel 2: 705Kg – 1.81m x 1.3m x 1.9m

LOGISTICS VISUALISATION

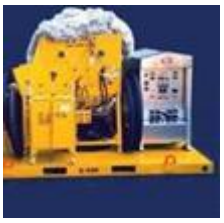


OFFSHORE SKIMMERS

Our range of recovery devices can be used on light, medium and heavy oil. Oleophilic, weir and mechanical skimmers provide the ability to recover a range of oil types in a variety of environments. Skimmers should be used in conjunction with containment booms where slick thickness is increased to maximise recovery efficiency.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Termite/ Terminator skimmer Foilex Rapid Deployment skimmer Lamor Mini Max 30 skimmer GT185 skimmer + brush adapters DS250 skimmer Sea mop Komara 40K Komara Star skimmer Rotodrum Helix skimmer Tombola WP130 skimmer Sea Devil	Palletised skimmer dimensions: 800Kg – 2m x 1.5m x 1m Loaded on skid dimensions: 1400Kg – 3m x 2m x 1.25m Loose skimmer dimensions: 800Kg – 2.5m x 2.3m x 1.4m

LOGISTICS VISUALISATION



OFFSHORE STORAGE

We have several options for temporary 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.
Temporary portable storage tanks are available in two sizes: 2,000 gallons and 1,100 gallons.

EQUIPMENT	WEIGHTS AND DIMENSIONS
5 Tonne barge (Sea Slug) 10 Tonne barge (Sea Slug) 25 Tonne barge (Sea Slug/barge) 50 Tonne barge (Sea Slug/barge) 10m3 Waste Containment Tank	Largest barge palletised size: 620Kg – 2m x 1.5m x 1m Largest bag palletised: 1600Kg – 2.95m x 2.01m x 1.25m Containment Tank: 2500Kg – 3.96m x 1.8m x 2.65m

LOGISTICS VISUALISATION

FIREBOOM

Controlled burning can be an extremely valuable response technique when responding to a significant oil release in open water. It was proven to work with great effect during the Macondo response, where an estimated 29,200 to 41,200 barrels of oil were removed from the marine environment in over 400 controlled burns.

We now have the capability to conduct in-situ burn operations with our Hydro-Fire booms in Southampton and Singapore which complement the stock of American Fire boom held in Fort Lauderdale.

EQUIPMENT	WEIGHTS AND DIMENSIONS
• Hydro fire boom reel • Water pump • Fire boom • Heli-Torch	Hydro fire boom Reel: 3500Kg – 3.1m x 2.3m x 2.61m Support pallet: 710Kg – 2m x 1.5m x 1m Water Pump: 1280Kg – 2.2m x 1.4m x 1.9m Palletised Ceramic boom: 1374Kg – 2.95m x 2.01m x 2.03m

LOGISTICS VISUALISATION

MARINE DISPERSANT SYSTEMS

Our range of recovery devices can be used on light, medium and heavy oil. Oleophilic, weir and mechanical skimmers provide the ability to recover a range of oil types in a variety of environments. Skimmers should be used in conjunction with containment booms where slick thickness is increased to maximise recovery efficiency.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Boat spray 50 Boat spray 100 Dispersant transfer System Vessel Spray slickbar Eduction Spray System (chemspray) Neatsweep Fluorometer	Palletised boat spray systems (2 systems per pallet): 400Kg – 2m x 1.5m x 1m Neatsweep: Reel: 1900Kg – 2.1m x 3m x 2.15m Support pallet: 700Kg – 2m x 1.5m x 1m

LOGISTICS VISUALISATION



SHORELINE BOOM

We have a range of booms that can be used for offshore, near shore and shoreline responses. Due to differing operational conditions, a variety of boom types are held in our stockpile.
The majority of the shoreline booms are air-inflatable and manufactured from polyurethane nylon fabric.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Sea Sentinel (10m/20m) Sea Sentinel Reel (200m) Shore Guardian (10m/15m/20m) Troil Boom GP 750 (20m) Troil Boom GP1100 (25m) Supermax boom (25m) Sea curtain boom (50m) River Boom 12” (15m) River boom 10” (10m) Nearshore Boom 18” (30m) Nearshore Boom 20” (15m) Nearshore Boom 24” (30m)	Palletised shoreline boom: 1080Kg – 3m x 2m x 1.25m

LOGISTICS VISUALISATION

SHORELINE SKIMMERS

We have a large range of recovery devices that are used on light, medium and heavy oil. These skimmers provide the ability to recover a range of oil types in a variety of environments.
Skimmers can be used in conjunction with containment booms where slick thickness is increased to maximise recovery efficiency.
When choosing a skimmer type, identify first the oil viscosity, its propensity to emulsify, and the expected operational conditions.

EQUIPMENT	WEIGHTS AND DIMENSIONS
• Komara 7 • Komara 12 • Duplex skimmer • Rope mops (OM240/OM140/9D/Trailered) • Cowen Weir • Komara 20 • Elastec Drum skimmer • Magnum 100 Skimmer • Skimpak • Marflex Arms • Minivac systems (Vikoma/Roclean) • Delta weir skimmer • Slickdisc MK-13 • Aquaguard RBS-20 • Aquaguard RBS-5 • Desmi DBD5 • TracVac system • Lamor LWS 70 • Minimax weir skimmer	Palletised shoreline skimmers: 2915Kg – 2.95m x 2.01m x 1.25m

LOGISTICS VISUALISATION

SHORELINE STORAGE

Waste containment tanks are also available with a capacity of 9m³. These tanks are used together with a heating system that
is capable of heating high pour point oil during the offshore and shoreline recovery.
Temporary portable storage tanks are available in two sizes: 2,000 gallons and 1,100 gallons.

EQUIPMENT	WEIGHTS AND DIMENSIONS
• Fastank 9m3 and 2m3 • Canflex floating collar tank 1000 gal, 2000 gal and 3000 gal • Pit Liner 398T • Ro-tank 10m3 • Decant tank 4T	Inshore Storage: 996Kg – 3m x 2.1m x 1.8m

LOGISTICS VISUALISATION

EGMOPOL BARGE

The Egmopol is a self-propelled skimming barge fitted with a belt skimmer system. It is ideal for us in harbours, lakes and sheltered waters.
The Egmopol barge is stored at the Southampton base.

EQUIPMENT	WEIGHTS AND DIMENSIONS
• 2 x Hull sections • 1 x Collection system • 1 x Support box	Hull sections (x2): 1600Kg – 10.1m x 1.2m x 1.3m Collection system: 4600Kg – 10m x 1.93m x 2.25m Support box: 609Kg – 1.7m x 1.12m x 1.1m

LOGISTICS VISUALISATION

ALL TERRAIN VEHICLES

We can provide a variety of vehicles suitable for response duties.
In a shoreline environment, 6x6 wheel 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.

EQUIPMENT	WEIGHTS AND DIMENSIONS
JCB Sportsman Ranger John Deere Gator Bobcat	JCB on trailer: 1400Kg – 4.5m x 2.05m x 1.65m Sportsman on trailer: 1000Kg – 3.05m x 1.9m x 1.35m John Deere Gator: 1000Kg – 2.95m x 2.01m x 1.24m Bobcat: 2600Kg – 3.33m x 1.96m x 1.75m

LOGISTICS VISUALISATION

POWERPACKS

We have several types of Diesel hydraulic power packs that are suitable to operate mechanical oil recovery devices, boom reels and deployment ancillaries.
All power packs are provided with the necessary spares kits and ancillaries.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Grizzly 98Kw Tiger 84Kw GP10 GP30 Lamor 23Kw Desmi/ Hatz 25Kw Same 50Kw Desmi 50Kw Vikoma 93Kw	Grizzly 98Kw: 1950Kg – 2m x 1.47m x 0.96m Tiger 84Kw: 2000Kg – 2m x 1.5m x 1m

LOGISTICS VISUALISATION

HYDRAULIC HOSE REELS

Hydraulic hose reels are stored at all OSRL bases. Generally, each reel holds a 50 metre hydraulic umbilical and 50 metres of layflat discharge hose.
Hose reels will be mobilised as required to operate equipment.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Holding a combination of hydraulic and layflat hoses, primarily to support offshore operations	Hydraulic Hoses Reels: 600Kg – 1.3m x 1.2m x 1.4m

LOGISTICS VISUALISATION

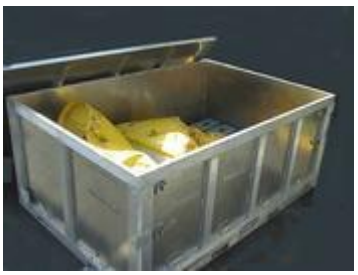
COMMAND PALLETS

OSRL have Command Pallets in both Singapore and Southampton.

These can be used as a command centre, a first aid post, a maintenance area and as a shelter for personnel taking rest breaks.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Available from all bases, containing: Inflatable tents Generators PPE Decontamination equipment Site facilities equipment	Command Pallet 1600Kg – 2.9m x 1.95m x 2m

LOGISTICS VISUALISATION



WILDLIFE RESPONSE PALLETS

We hold a range of specialist wildlife response equipment, which can be used to assist with the rescue, treatment and rehabilitation of wildlife that is affected by oil spill incidents. This equipment, which was selected by professional wildlife responders, can be easily shipped together with other response equipment and utilised by trained wildlife response experts.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Search and Rescue equipment Intake and Triage equipment Cleaning and Rehabilitation equipment Rehabilitation unit	Search and Rescue, Intake and Triage, Cleaning and rehab (max weights and dimensions): 520Kg – 2m x 1.5m x 1m Rehabilitation unit: 1920Kg – 3m x 2.1m x 2.1m

LOGISTICS VISUALISATION

FAST RESPONSE TRAILERS

The trailers have been equipped with shoreline booms and ancillaries to enable us to react quickly and deploy rapidly to protect a specific site at risk.
The load provides the capability for prompt action in order to protect vital resources from contamination.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Trailers available in Bahrain and United Kingdom for response by road only	Various – Road or local response only

LOGISTICS VISUALISATION

Property of Oil Spill Response	Document Title	Document Number OSRL-OPER-GUI-00705	
OSRL	LOGISTICS PLANNING GUIDE (LPG) SERVICE LEVEL AGREEMENT (SLA)	Revision	3

ANCILLARIES/SUPPORT EQUIPMENT

Ancillary and support equipment are held at all OSRL bases for a variety of different response situations, the majority is packed in pallets other than pressure washers that may be trailered but are still air freightable.

EQUIPMENT	WEIGHTS AND DIMENSIONS
Various communication equipment Spate pumps DOP pumps Peristaltic pumps Sala Roll mop c/w power pack Fire/washdown pump Trash pump Boom support equipment Shoreline flushing equipment Boom Vane Decon Sets Pressure washers (hydraulic and diesel) Generators Lighting Sets Gas monitors Orimulsion Refloater Tracking Buoys	Various

LOGISTICS VISUALISATION




APPENDIX C: Boeing Service Notice for Liquid Cargo

BOEING

Commercial Aviation Services

SERVICE LETTER

FLEET SUPPORT ENGINEERING • BOEING COMMERCIAL AIRPLANES • P.O. BOX 3707 • SEATTLE • WASHINGTON 98124-2207

707-SL-02-005	757-SL-02-022	DC-10-SL-02-002
717-SL-02-103	767-SL-02-016	MD-10-SL-02-103
727-SL-02-007	777-SL-02-007	MD-11-SL-02-103
737-SL-02-023	DC-8-SL-02-002	MD-80-SL-02-103
747-SL-02-018	DC-9-SL-02-002	MD-90-SL-02-103

ATA: 0200-30
15 December 2010

SUBJECT: TRANSPORT OF LIQUID CARGO

MODEL: ALL

APPLICABILITY: All models

REFERENCE: IATA Dangerous Goods Regulations, Packing Section 5.0.2.8

SUMMARY:

This service letter provides guidance information for the transport of large volumes of liquid cargo to avoid unwanted cyclic lateral motions that may cause to flight crew to divert or turn-back.

BACKGROUND:

A 747-400F operator reported two events when the flight crew experienced significant lateral oscillations due to sloshing of liquid cargo. One event with 238,103 lb. (108,002 kg.) of liquid cargo resulted in an air turn-back due to continued lateral oscillations. A subsequent flight with 118,316 lb. (53,667 kg.) of liquid cargo did not cause noticeable lateral oscillations.

DISCUSSION:

The transport of a large amount of liquid cargo in large containers or multiple smaller containers can result in cyclic sloshing of the liquid in the void (ullage) at the top of each container. Sufficient ullage must be provided to allow for thermal expansion of the liquid in the container to 55 deg. C (130 deg. F.), per the reference. Sloshing movement of the liquid cargo in the ullage can result in low frequency lateral loads on the airplane. The lateral loads from sloshing in large tanks or multiple smaller tanks can be additive, resulting in lateral oscillations that cause poor ride quality. A large amount of high-density liquid cargo in a container with a large ullage

could, in an extreme case, result in high loads on the airframe that could potentially result in damage to the structure. Boeing is not aware of such tank sizes that are in commercial use and are shipped as airplane cargo.

BOEING ACTION:

Boeing has conducted studies on sloshing liquid cargo and has worked with the airline that reported in-service events. Boeing is issuing this service letter to provide operators with recommendations from these studies and from in-service airline experience. Boeing has reviewed this issue for potential safety and determined that sloshing cargo is not a safety issue, but may result is crew action such as air turn-backs if the sloshing results in lateral motions and poor ride quality.

SUGGESTED OPERATOR ACTION:

Boeing suggests that operators consider the potential adverse effects from sloshing large volumes of liquid and suggests the following operational considerations:

1. Avoid the use of large tanks with large ullages.

2. Use tanks/containers with baffles, where possible. Baffled tanks will damp the sloshing motion and prevent sustained oscillations.

3. Avoid locating the liquid cargo far from the airplane center of gravity where sloshing can cause larger lateral motion effects on the airframe. Instead, locate high-weight liquid cargo near the center of gravity and preferably over the wing box on the main deck. Liquid cargo in the lower lobe compartments should be loaded just forward or just aft of the wing box.

4. Consider limiting the total weight of liquid cargo to no more than 42% of the airplane cargo capacity. This value has been demonstrated in service on 747-400F airplanes to not cause noticeable lateral oscillations for un-baffled multiple containers.

5. Unit Load Devices (ULD) carrying liquid in containers should have all restraints operative with no missing or inoperative restraints. Where the ULD carrying liquid in containers is restrained using the airplane installed cargo restraints, the weight limit for the cargo position should be reduced by 50% for tanks that are 2/3 full, and reduced by 20% for tanks that are 90% full. Further, the if ULD carrying liquid in containers are tied down to the airplane, an additional "slosh" load factor of 2.0 should be used in the

forward, aft, and side directions for tanks 2/3 full, and a "slosh" load factor of 1.25 in the forward, aft, and side directions for tanks 90% full.

6. If liquid cargo induced airplane lateral oscillations are noted in flight, then the flight crew should consider diversion or air turn-back if the crew is being fatigued or otherwise impaired by the oscillations.

7. If high weights of liquid cargo must be carried in tanks without baffles, consider having the cargo shipped frozen, if freezing will not harm the liquid cargo or surrounding cargo. A review of the planned flight duration should be made to confirm that the cargo will not melt before the end of the flight.

WARRANTY INFORMATION:

Warranty remedies are not applicable to the subject discussed in this service letter.

CMC / EICAS MESSAGE:

N/A

MGD: pjp