

Annex V of the VAC
Technical Specifications for the equipment
(Lot 2 – Atlantic North)

Procurement procedure: EMSA/CPNEG/2/2021

Title: Service Contracts for Stand-by Oil Spill Recovery Vessel(s)

Phase II – Invitation to Tender

All the costs related to the purchase and transport of additional equipment, transportation of transferred equipment as well as servicing of the transferred equipment in line with this Annex and as per below requirements have to be included in the “equipment costs”

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1. General description of the equipment

The oil pollution recovery equipment comprises two different at-sea oil recovery systems designed to recover medium to high viscous oils. Those systems will be installed on board when operating as an oil spill recovery vessel although they will not be used at the same time.

The Contractor will receive the set of equipment as listed in Section 4 and described in detail in Section 5 of this document. However, the Contractor will be responsible for the correct functioning of the equipment according to the parameters of its technical specifications.

1.1. Equipment Transferred

The contractor will receive from EMSA the equipment listed below:

1. High-capacity skimmer, Lamor
2. Cleaning machines
3. Flow meter

All tenderers will have the opportunity to visually verify the condition of equipment items listed above in the stockpile in Cobh, Ireland at request. In principle the visit will be organised in week 26. The visit details will be arranged with the requesting tenderer. If due to the COVID-19 travel restrictions or other health risk considerations the visits cannot be organised then EMSA will provide tenderers with additional detailed technical information on the transferred equipment including, manuals, pictures and videos.

1.2. Servicing of the equipment

The equipment that will be transferred to the Contractor was purchased in 2018 (skimmer, in 2012 (flow meter)) and in 2014 (cleaning machines). It is generally in good condition. The skimmer has never been used to recover oil and it has been kept in a warehouse). The equipment has been categorised and appropriately labelled. It has undergone regular maintenance according to the manufacturer's specifications. The maintenance was closely monitored by EMSA. The working condition of the equipment is regularly verified by the Agency during drills.

The Contractor will be responsible for the safe, reliable and sustainable operational use of the equipment. Therefore, the Contractor should arrange servicing to the equipment after the handover but before expiration of the Preparation Phase. In such a case, each tenderer will include in its financial offer regarding the oil pollution response equipment, the estimated servicing costs. This estimation will be considered as the ceiling that EMSA will reimburse in relation to the equipment servicing.

Detailed report of the service(s) actually carried out on the equipment item(s) shall be included by the Contractor as part of the Completion Report. This report should include as a minimum list of works performed, list of parts replaced and/or repaired, photos, etc.

The servicing might be performed by a third party subcontracted by the contractor (e.g. manufacturer of the equipment or a specialised local company).

The contractor should arrange servicing to the following equipment:

1. Cleaning machines
2. Flow meter

The servicing to this equipment should include the following:

- Check of engine and change oil, coolant liquid, filters (oil, air, fuel);
- Replacement of all seals, O-rings, etc, where applicable;
- Check the paint and repaint, if necessary;
- Calibrate the flow meter, if necessary.

1.3. Additional equipment

Contractor will need to purchase/deliver the following equipment:

1. Rigid Sweeping arms

The sweeping arms will be constructed in such a way that they can recover any type of surface pollutant which has a density lower than water and which can pass through the inlet. The sweeping arms must be of rigid type.

Diagrams showing the position on the vessel of the arms as well as the deployment and recovery manoeuvre must be included in the bid.

Each rigid sweeping arm system shall consist of a steel fixed sweeping fence with oil resistant rubber fenders, which can be towed at an angle alongside the vessel, with a built-in weir type skimmer. However, it must have interchangeable skimmer heads of brush and weir type. The arm will also have a submerged pump in the hull's nearest edge to transfer, via a semi-rigid hose, the recovered mixture to a tank or hopper onboard the vessel. The steel structure shall have at least 4mm of thickness. Although it will depend on circumstances, the usual towing angle will be 60° on the basis of a sweeping speed of 1.5 to 3.5 knots.

The vessel will have one sweeping arm located on each side of the vessel (total two), which length will depend on the size of the vessel and the available space on deck. A minimum length of 12 metres is required although 15 metres is **preferred**.

The sweeping arms will be handled and deployed by cranes placed on board. The necessary hoisting eyes in the arms shall be welded to the arms structure in order to hoist and deploy the sweeping arms safely and shall be provided with towing chains to which a towing wire can be fastened.

Where possible, the arms can be executed with foldable ends to reduce the overall dimensions and facilitate the transportation.

A hoisting gear with a manually operated winch for pump cleaning is to be provided.

Each sweeping arm will have an adjustable overflow (when the sweeping arm is working with a weir skimmer installed) and a pump capable of processing the thickest oil-water mixture. A remotely controlled self-cleaning grating will be provided to avoid interference from debris at the suction side.

Once the arms are in their operational position, a cable system, manned from the bow windlasses or winches, will keep them in an appropriate position.

The two sweeping arms will direct the oil/water mixture to be recovered to a collection chamber where submerged hydraulically driven pumps are installed. The model of the pump chosen will have to be specially designed to transfer high viscous oils or emulsions as follows:

- For the weir skimmer module - centrifugal pumps with a capacity not less than 300 m³/h of water at 6 bar or equivalent.

- For the brush skimmer module - Positive Displacement Archimedes Screw Pumps with a capacity not less than 125 m³/h of water at 7 bar or equivalent.

Both types of pumps must be provided (a pair of each type). In any case, the maximum discharging pressure will be at least 10 bar and the diameter of the discharging hose will be of at least 6 inches. A radial current system of hot water injection in the inlet and outlet of the pump or equivalent where appropriately justified, will be installed in order to facilitate the flow of the oil to the storage tanks.

The oil recovery hoses will be semi-rigid and as short and wide as possible. Once the recovery hoses reach the vessel, they will be connected to loading pipes of a diameter of at least 8 inches to direct the recovered product to the cargo tank(s) or hopper. The recovery hoses should not be longer than 20 m although 10 m is expected. The height from the water line to the connection to the loading pipe should be less than 6 m.

The whole system will be operated from a control desk with the necessary safety mechanisms, alarms and emergency stops. The control desk will have good visibility of the sweeping arms manoeuvring. From the control desk it shall be possible, as a minimum, to remotely deploy and hoist the sweeping arms.

When no oil recovery operations are being carried out with the sweeping arms, they will be stowed in such a position where they are safe from the sea and/or from other operations. Alternatively, they will be stored onshore in the “home” port, ready for quick installation.

The sweeping arms will be able to operate safely at least until a sea state of Beaufort 5 conditions.

Cranes for Sweeping Arms

The rigid sweeping arms shall be deployed using two cranes. Each crane shall have its own hydraulically driven winch and hydraulic cylinder for moving the rigid sweeping arm from the inboard to the outboard position of the vessel. The cranes shall be welded or bolted to a deck foundation. They shall be equipped with a double hook. The first hook will be on the reaching limit of the crane and the second hook will be located at 5 meters (approx.) from the fixed arm reaching limit. The cranes will have adequate capacity to hoist and deploy the sweeping arms.

The rigid sweeping arms shall be secured by sea fastenings to the deck of the vessel.

Each crane shall be remotely controlled from a control desk from which the operator must have good visibility of the overall manoeuvring operation with the arms. The cranes should, in any case, be suitable for operation of vessels at sea. If necessary, the cranes shall be approved by a Recognised Organisation in accordance with Regulation (EC) No 391/2009 and/or Flag Authorities.

Ancillary Equipment Sweeping Arms

The sweeping arm system shall comprise all the necessary power packs, hoses, cables and tools to:

- Stow the sweeping systems and ancillary equipment on board in a safe way while sailing. Should the length of the hoses be such that the safety of the operations is somehow hampered when the arms are deployed or during the deployment or hoisting manoeuvre, then a galvanised steel reel should be installed to stow such hoses.
- Deploy the sweeping systems on the water surface.

- Tow the sweeping arms in a safe manner with a secure system to avoid their loss, and maintain the appropriate sweeping angle.
- Hoist the sweeping arms to their onboard stowing position as soon as the operation has finished.
- Couple the oil recovery hose to the storage tanks inlet or oil/water separator when applicable.

Two diesel hydraulic power packs must be provided in order to operate the two sweeping arms.

2. Boom system

The boom acts as a containment and concentrating device whilst the skimmer is used to pump the oil which has been contained to the storage tanks on board. When recovering oil, the boom is towed by the vessel and an auxiliary towing vessel.

To carry out this operation, the vessel shall have two reels on board. Each reel will be hydraulically driven and be able to hold 250 m of open sea booms. The minimum height of the booms will be 1900 mm and the minimum freeboard 800 mm. If the boom is divided in different sections, each section will have standard connectors, with preference for ASTM connectors. The boom will be of the Curtain type and inflated via pressurised air. The skirt material may be either PVC-Coated Polyester or Vulcanized Neoprene Rubber. The length of each section, where applicable, shall be of at least 3 m, the towing speed at least 0.7 knots in the perpendicular, the ballast material shall be galvanised chain, the reserve buoyancy shall be of at least 300 kg/m and the reserve buoyancy to weight ratio will be of at least 10. It shall be fast to deploy and easy to maintain and clean. The total strength of the boom as a whole will be of at least 20t. They must be containerised with all the necessary equipment to deploy them (e.g. compressor). The necessary space on board will be considered for storing the container(s).

Self-inflatable booms should only be used when either there is not enough space on deck to deploy it safely or when the vertical distance from the boom reel pedestal to the sea surface is more than 3.5 m.

In terms of breaking strength (BS), the towing line must have a lower value than the connectors and around 75% of the boom value:

- BS towing line < BS connectors
- BS towing line $\approx 0.75 \times$ BS boom

The boom spare kit must include a spare towing line.

The model of boom selected must be able to be deployed in open U configuration. Appropriate fittings/devices to achieve this configuration must be included if necessary. A second portable compressor can be provided to ensure that the boom maintains its integrity when towed by auxiliary vessels, if needed.

3. Adjustments to the power pack: Adjustments to the hydraulic power pack of the transferred Lamor high- capacity skimmer (e.g. purchase of a hydraulic control panel) in order to be able to operate the boom system according to its technical specifications. Alternative proposals duly justified (e.g. use of ship's hydraulic system) can also be considered.

4. Slick Detection System: The oil encounter rate is improved when the oil layer thickness of the recovery area is larger. The vessel will have a system installed, which, without external aid, is capable of detecting the location of the highest concentration of oil. The system will permit the vessel to continue oil detection in low visibility conditions so that the oil recovery operations are not aborted due to lack of visibility.

The system must be permanently installed onboard. In the case a “pool” of vessels is offered, then each vessel must have a system installed. During data capture, the vessel movement will be compensated in order to ensure the reliability of the information.

The system will be able to provide continuous monitoring of the slick area and, in combination with current and wind data, predict the oil spill trajectory. It will be possible to record the evolution of the spill trajectory in video format. Such a format should be compatible with common media players software.

The system should also provide an estimate of the spill area by size, real time distance measurement to a defined point and will be able to be overlaid with an electronic map. The ability to calculate volume in combination with other data is appreciated. However, a system which measures directly both slick size and thickness is preferred.

The detection range shall be at least 2 nautical miles and will operate efficiently in wind speed of 2m/s or more.

The integration with VHF frequency used in the AIS system is mandatory if such a system is not already installed on the vessel.

The Graphic User Interface shall be user-friendly with a PC-based data processing capability. The layout of display and colour, for use both day and night, will be specially made for operation on a vessel's bridge. The system must be regularly (annually) updated with the latest software for the system during the whole duration of the contract.
5. Communication devices: At sea oil recovery operations require a number of different actors at different locations. In addition to the GMDSS area A3 requirements set in point 15 of Annex IV, the vessel must be able to communicate with aircrafts, so two VHF radiophones, aeronautic band, will be foreseen for recovery operations or exercises.
6. Gas Detector: It will be needed to check the presence of explosive gases
7. Interface Detection System: When the oil/water mixture is stored in the tanks, the water and the oil is naturally separated due to the difference in density. The tenderer shall provide adequate equipment (fixed or portable) to detect the interface border between the oil and the water so that the quantity of actual oil stored is known.
8. Sampling Mini-Lab: The vessel will be equipped with a portable mini-lab and a sampling device to analyse, at least, the density and viscosity of the recovered product. The range of the minilab will be enough to measure a specific density from 0.80 to 1.2 and a kinematic viscosity of at least 100,000cst. The results of the analysis will be expressed in international units.
9. EMSA logo on equipment: At least one EMSA logo must be attached/painted on a visible position on each sweeping arm and crane, skimmer frame (if possible), boom reel, power pack, storage or tank containers. The dimension of the logos shall be in proportion to the items to be marked.

The Contractor will purchase the above listed additional oil pollution response equipment items and will obtain and conserve ownership of them until the Clearance of the Preparation Phase is completed. All provisions of the Contract including article IV.4.3 (transferable call option) shall apply to the additional oil pollution response equipment items.

10. **Vessel Model:** At the end of the preparation phase, the Contractor will deliver to EMSA, at its premises in Lisbon, a model(s) of the Vessel(s) at (approximate) scale 1/100. All oil pollution response equipment will be displayed, in the appropriate scale, on board the model(s). In particular, one system must be deployed, simulating recovery of oil with the option to display the alternate system (sweeping arms or boom/skimmer systems). The model(s) should be as detailed as possible, preferably made of plastic or metal. The model(s) remains the property of EMSA, only to be used by the Contractor upon request with the agreement of EMSA. Any cost related to the production of the model and its transportation costs shall be borne by the Contractor¹.

2. Handover procedure for equipment transferred

The conditions of handover, transportation, storage and insurance of the equipment are described below. If any part of the equipment delivered is not used by the Contractor due to the fact that it is not suitable for the vessel offered, the associated costs for the storage, insurance and maintenance shall be borne by the Contractor.

2.1. Date and place of the handover

Prior to the handover, the Contractor shall designate a representative whose name and position shall be communicated in writing to EMSA. The Agency may also designate a representative to witness the handover process.

The items listed in point 1.1 above will be made available for handover and ready for transportation at their relevant storage location as follows:

The handover will be done at a date to be mutually agreed between EMSA and the Contractor and shall not take place earlier than **13 June 2022** and not later than **13 July 2022**.

On the handover dates, the Contractor representative shall be present and verify the delivery of the equipment in question.

A delivery/receipt statement prepared by EMSA will be used in order to acknowledge handover of all the oil pollution response equipment items. By signing the delivery/receipt statement on the handover date, the Contractor representative accepts the equipment in its current condition.

2.2. Transportation

The Contractor shall bear all risks involved in transporting (including loading and unloading) for the items listed above from the handover place to the new storage facilities.

The Contractor shall arrange the packing and preparation of the items for transportation, provision of stevedoring services and lifting resources (e.g. forklifts, mobile cranes, etc.) and all necessary shipment.

The costs related to the transportation (including insurance during transport) of the equipment must be paid initially by the Contractor. However, these costs are, within the contract budget ceiling, reimbursed by EMSA as part of the oil pollution response equipment purchase. Accordingly, the tenderer shall include in its financial offer the estimated transportation costs for the oil pollution response equipment.

2.3. Storage and insurance

Prior to the equipment handover, the Contractor shall arrange for the appropriate storage and insurance of all the oil pollution response equipment.

¹ The model price should be indicated in the bid for information only.

For the purpose of taking out the full risk insurance policy covering the transferred oil pollution response equipment items, the value shall be the purchase value as described under in the table in point 4 below.

3. Use of the oil pollution response equipment

The equipment that must be installed/carried simultaneously on board for oil pollution response must include, as a minimum, the following configurations:

- the sweeping arm system,
- the boom system (2 x reel) + high-capacity skimmer system,
- the oil slick detection system,
- other equipment (minilab, flashpoint tester, etc.)

and their relevant power packs and ancillaries.

This configuration will be tested during all quarterly drills every year.

4. List of transferred equipment

Category	No	Item	Item Brand	Item Model	No of Pcs	Reception Date	Additional info	ID Code (old)	ID Code (new)
1. High capacity skimmer (EUR 802,388)	1.1	Power reel	Lamor	LUT 5 80	1	17/09/2018	Umbilical Hose Reel Telescopic LUT 5/80 on a 10' flat rack footprint	n/a	2697
	1.2	Umbilical hose			1	17/09/2018	Umbilical Hose LUH 5" 80m, 11 Ch, Anti static	n/a	2698
	1.3	Remote control			1	17/09/2018	Radio Remote Control MC-3-6 EX M36-EX501058 with Receiver Base Units 1 (LWS 1300) 2 (UHW)	n/a	2699
	1.4	Flow meter		DP65/ED	1	17/09/2018	AISI316 DN125, PN16 20-135 m3/h - integrated	n/a	2700
	1.5	Hydraulic hose(s)				17/09/2018	Set 10m, SS for Umbilical Hose Reel, incl. Water Injection Hose SS, 10m	n/a	2701
	1.6	Weir module	Lamor	HC LWS 1300	1	17/09/2018	With hydraulic thruster set	n/a	2702
	1.7	Ancillaries			1	17/09/2018	Removable Debris Screen for LWS 1300 MkII	n/a	2703
		Ancillaries			1	17/09/2018	Water injection outlet assembly, DIN 5" flange D125 PN 16 SS, TEMA 5011 RFV SS, for LWS 1300 Mk II skimmer	n/a	2704
	1.8	Brush module			1	17/09/2018	Brush adaptor with removable debris screen	n/a	2705
					1	17/09/2018	Brush adaptor with removable debris screen	n/a	2706
					1	17/09/2018	Brush adaptor with removable debris screen	n/a	2707
	1.9	Pump	Lamor	GT A 140	1	17/09/2018	Cargo pump with water injection kit, inlet 3/4"	n/a	2708
			Lamor	LIP 400 IP	1	17/09/2018	Water injection pump for HC skimmer and PDAS pump	n/a	2709
	1.10	Ancillaries			1	17/09/2018	Ancillaries for the water injection pump 1 x water suction hose semi rigid Apollo 2 1/2" L-5m; 1 x suction stainer & check valve camlock 2 1/2" SS 1 adapter camlock 2 1/2" -TEMA 1/2" SS 2 x water injection hose 20m, SS 2 x hydraulic hose 1/2" x 15m, SS TEMA 5000	n/a	2710
	1.11	Power Pack	Lamor	LPP 95	1	17/09/2018	Diesel driven, hydraulic start, battery 70 Ah Installed inside of a 10' ISO closed container	n/a	2711
	1.12	Oil hose(s)			2	17/09/2018	Semi Rigid, multi-oil blue heavy duty 5", 2 x L-10m, anti static	n/a	2712
	1.13	Cover				17/09/2018	20' Steel container storage roof with side door for 2 x 10' flat-racks (power reel and LWS 1300 skimmer) including 8 lashing twist locks	n/a	2713
	1.14	Spare parts				17/09/2018	Spk1 for GTA; Kit rubber adhesive for LUH; Spk1 for weir skimmer; Spk1 for Brush adapter; Spk1 for LPP 95; 1 Hydraulic Hose set between LUH and LWS; 1 hydraulic hose set 10m for power reel; paint repair kit	n/a	2714
2. Discharging (EUR 12,100)	2.1	Flow meter	KRONHE	UFM 3030		23/06/2012		CCEE180001	0361
3. Cleaning (EUR 14,976)	3.1	Cleaning machine	Nilfisk Alto	Neptune 5-51DE	1	13/06/2014	High pressure, Hot water, Diesel		0418
			Nilfisk Alto	Neptune 5-51DE	1	13/06/2014	High pressure, Hot water, Diesel		0419

Disclaimer

Any specifications and/or graphic material must not be understood as a commercial endorsement by the Agency of any given piece of equipment and/or manufacturer/supplier.

If there is a contradiction between this Enclosure and the manufacturers' manuals, the manufacturers' manuals take precedence.

5. Description of the Equipment

The equipment to be transferred from the expiring contract, as described in this section, consist of the following sets:

1. High Capacity Skimmer

Manufacturer: Lamor Corporation Ab

Website: www.lamor.com

Year of purchase: 2018

1.1 Lamor Power Reel and

1.2 Umbilical Hose (LUT) 5/80

The Lamor Umbilical Hose Reel (LUT) 5/80 has been designed as a single system to easily and efficiently deploy a large oil skimmer off a vessel in an emergency oil spill response operation. The LUT provides control and ease of use by a single operator.

This LUT system includes the following features:

- Crane arm (additional telescoping and vertical lifting cylinders available)
- 360° turntable
- Single 10' flat rack
- Container cover for storage or transport
- Radio Remote control
- Mooring function



Lamor Umbilical Hose Reel (LUT) 5 80

LUT system is furnished on a 10' (ISO 668) flat rack base. This compact sized platform allows installation of the system onto a limited work space.

When combined with the 10' skimmer base and the 20' roof module, the equipment is containerized for storage and transport.

LUT systems are designed to deploy the Lamor Free Floating (LFF) 100. The umbilical hose and skimmer is supported during deployment by a crane arm integrated to the reel.

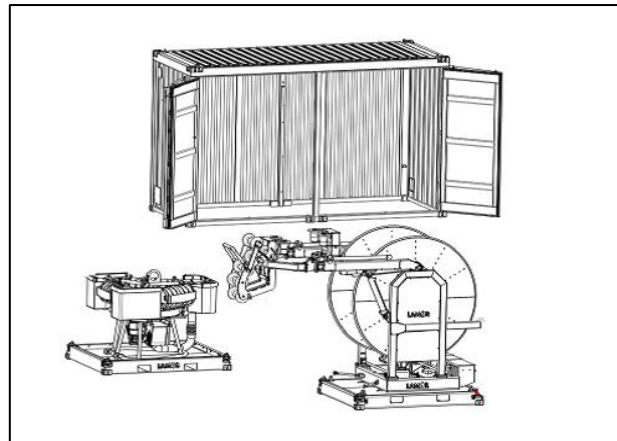
The crane arm includes a telescoping system and vertical lifting cylinders.

The system is mounted on a 360° rotating, hydraulically driven turntable increasing control and the range of the operation.

The hose reel itself combines all necessary hydraulic and transfer hoses needed to operate the skimmer in a neatly packaged hose.

The oil transfer and hydraulic hoses are connected to manifolds at the hub of the reel by pump-through swivel joints allowing the hydraulic hoses to be continuously energized and providing uninhibited flow in the oil transfer hose at any deployed length.

LUT system EX Zone II has designed according 2014/34/eu ATEX directive. The corresponding ATEX-code is II 3 G Ex h IIB T4 Gc.



System drawing (without power unit)



Skimmer assembled in a 20' container

System technical specifications

Components:	Description/Material:
System assembled	Assembled system of two flat racks and roof dimensions are: Width 2.438 m / 8' 0" Height 4 m / 13' 2" Length 6.058 m / 19' 10.5" Weight (dry) 14 tonnes (Weight wet 15 tonnes)
Umbilical hose reel on flat rack	Foot print 10ft container Length 2990 mm Width 2437 mm Height 3950 mm Weight (dry) 10 000 kg (Weight wet 11 000 kg) System pressure 210 bar
Skimmer flat	Length 2990 mm Width 2437 mm Height 2650 mm (Skimmer with flat rack) Weight (with skimmer) 1500 kg
The reel and skimmer flat racks are to be coupled into one 20 ft footprint flat rack (ISO 668)	
Container roof	Length 6058 mm Width 2438 mm Height 3685 mm

	Weight 2500 kg System is non-stackable
Painting	Blue RAL 5010 Teknos K27e

1.3 Remote control

The radio remote control (MC-3-6 EX) allows the operator a range of motion providing ease of deployment and increased safety. The remote control can control all components of the operation, including the reel and skimmer simultaneously.

The controller can be connected to the electronic control box by a backup cable if the radio signal is lost.



1.4 Flow-meter

The system is fitted with a flowmeter DP65/ED AISI316 DN125, PN16 20-135m³/h including resettable totalizer. It is a very robust instrument prepared to work in extreme conditions of pressure and temperature.

The local flow rate indication is done by means of magnetic coupling, with scales calibrated in l/h, m³/h, kg/h, t/h, %, etc.

The disk flowmeter is based on the indirect measurement of the force which is exerted on a disk suspended in the trajectory where a fluid flows at a certain speed.



1.6 Weir module

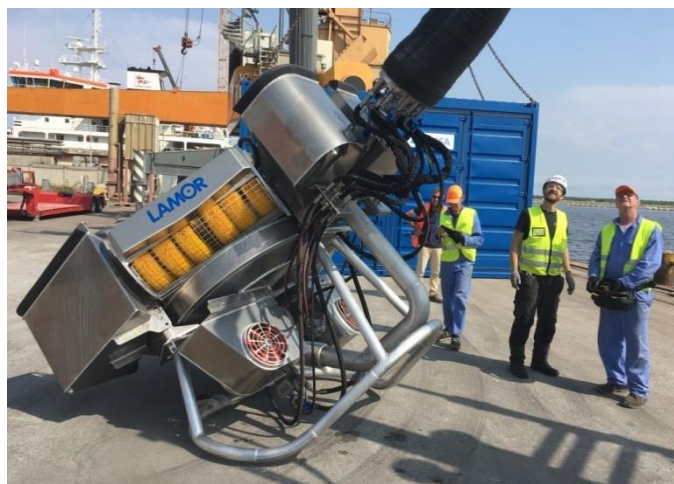
1.7 Ancillaries

1.8 Brush module

The Lamor Free-Floating Offshore Weir Skimmer, LWS 1300, is a high capacity weir skimmer designed for open ocean oil recovery. The skimmer is equipped with a floating weir lip that separates and collects the oil into a hopper. The floating weir lip has separate small ballast weights that can be independently adjusted, allowing perfect floatation even in difficult sea conditions. The floating level of the skimmer can be adjusted by moving the pontoons up or down on the skimmer frame.

The skimmer is hydraulically operated and fitted with two thrusters that allow the operator to manoeuvre the skimmer to where oil is the most heavily concentrated. A radio remote control can be operated from up to a 200m distance from the hose reel. The hydraulic power is supplied to the skimmer via hydraulic hoses.

The oil on the surface of the water is drawn over the weir lip into the skimmer by gravitational flow combined with the added suction of the screw pump. The skimmer can efficiently recover and pump a wide range of oils from light products to medium



Skimmer head

viscous, debris-laden emulsions. Recovered oil is discharged from the skimmer to the collecting tank by the transfer hose.

The skimmer frame is manufactured from aluminium with 3 specially designed aluminium air tight floats. The skimmer incorporates a large diameter free floating weir-lip that gives it excellent wave following characteristics. LWS weir skimmers have been specifically designed to work with a wide range of optional oil transfer pumps. The GTA pump is suitable for light to high viscosity oils. Please note that the pump will be specified separately.

The Lamor Brush Adaptor LBA 1300 Mk II is a brush-type oil recovery module designed to fit quickly and easily onto the hopper of the Off-Shore Weir Skimmer Lamor LWS 1300 Mk II. The purpose of the device is to improve the overall recovery efficiency (reduce free water recovered with oil) and to improve the performance in very high viscosity oils.

The three LBA brush banks are mounted within a sturdy aluminium frame with a centre-lifting eye. The brushes are driven by one hydraulic motor, which is powered by a single hydraulic circuit.

The LBA can be easily installed on the Lamor LWS 1300 skimmer hopper in place of the weir bellow and be secured with stainless steel clamps.

Total system operational weight including Weir Skimmer, Brush Adapter, Thrusters and Pump is 820kg.

Weir skimmer technical specifications

Technical Parameter:	
Length (mm)	2644
Width (mm)	2212
Height (mm)	1830
Weight (kg)	280
Weir Lip Diameter (mm)	1300
Capacity (m ³ /h)	360
Frame, Floats, Hopper, & Weir Lip	Marine-Grade Aluminum
Bellows	Reinforced Neoprene Rubber
Draft	1100

Brush adaptor technical specifications

Technical Parameter:	Specification:
Length	2050 mm (80.7 in)
Width	1800 mm (70.8 in)
Height	570 mm (22.5 in)
Weight	220 kg (485 lbs)
Maximum Certified Capacity*	3 x 74 m ³ /h (326 gpm)
Design Capacity*	3 x 60 m ³ /h (264 gpm)
Free Water Content	<2%
Hydraulic Flow	10 l/min (5.28 gpm)
Hydraulic Pressure	170-200 bar (2466-2901 psi)
Power Requirement	6.5 kW (8.7 hp)
Brush Base	Polyethylene
Stiff Bristle	Polypropylene
Brush Cleaner	Marine Grade Stainless Steel

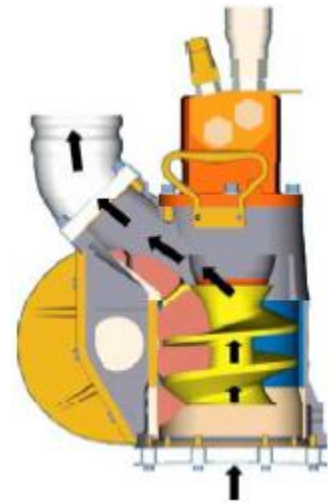
Brush Wheel Speed	0-60 rpm
Plastic clips and slides	Antistatic POM ELS
Drive Motor	Danfoss 11159803 OMR 200 ATEX

1.9 Pump GT A 140 and water Injection Pump LIP 400

GT A 140

The GTA series pumps is a multi-purpose submersible Archimedes positive displacement high performance screw pump that have a capacity of 140 m³/h. In addition to be a primary oil transfer pump, the GTA pump can be utilized for numerous applications such as offloading emergency pumping of heavy crude, bitumen, tank cleaning, pipeline maintenance, sludge removal etc.

The GTA pump design promotes a smooth pumping action and easy flow control that will not emulsify oily water and reduces cavitation ensuring a constant flow. The efficiency of the GTA pump is increased with a built-in annular water injection (AWI) flange at the pump outlet, which assist the flow of viscous materials, decreases the pressure while reducing friction in the oil transfer hoses thus making operations safer and more efficient.



The GTA ATEX pump casing is compact and made of duplex stainless steel casting. Moreover, all internal components are made of acid proof steel with specialized seals. The GTA has a debris grid and a cutting knife fitted on the inlet.

GT A 140 technical specifications

Pump capacity (m3/h)	140
Length (mm)	500
Width (mm)	300
Heights (mm)	598
Weight (kg)	71
Diameter (mm)	520
Flow (max l/min)	160
Pressure (bar)	210
Discharge pressure (bar)	10
Power requirements (kW)	56

LIP 400

The LIP 400 is built in a wheel frame and is hydraulically powered. Lamor LIP 400 IP ATEX EX Zone II has designed according 2014/34/EU ATEX directive. The LIP 400 IP EX ATEX-code is II 2 G e IIA T3 Gb.

Water injection pump technical specifications

Technical Parameter:	LIP 400
Pump Capacity	10 m ³ /h
Length	920 mm
Width	850 mm
Height	770 mm
Weight	150 kg
Discharge Outlet	2" Male Camlock

1.11 Lamor Power pack LPP 95

The Lamor Power pack LPP 95 is a diesel engine driven hydraulic unit suitable for operation in hazardous area Zone II.

A Flame protection system is fitted to the diesel engine in such a way that the outside temperature of diesel engine and even the exhaust system and other hotspots of diesel engine never exceeds beyond the conditions which are guilty for above mentioned protection group.

Several safety devices are fitted on the Power Pack and diesel engine and will do stop the Power Pack and the diesel engine in case of dangerous situations or mechanical failures.

The fuel tank is designed to contain fuel for a long time of use and that it is possible to mount the Diesel engine and hydraulic system of Power Pack in an as small as possible frame.



This Power Pack is designed to use on open hydraulic systems only. The hydraulic pump is a variable displacement hydraulic pump of axial piston swashplate design, for open circuit hydraulic systems.

Lamor Power Pack Type LPP 95J EX Zone II has designed according 2014/34/eu ATEX directive. The LPP 95J EX ATEX-code is II 3 G Ex h IIA T3 EPL Gc.

The power pack is installed in a **10 ft container** designed to be used for stowing and running Lamor Oil Spill equipment. The container is ISO 668:2013 compliant and has dedicated fittings for Lamor LPP 95 J, EX Zone II Power Pack. It also has an Earthing Point, one at blank side and second for internal connections. the 10 ft Container is designed to be used in hazardous area Zone II as described in 2014/34/eu ATEX directive.

Lamor Power pack LPP 95 operational specifications

Technical Parameter	Parameter value
Make/type	JCB 444 / PP1254
Design	4 cylinder line, water-cooled
Rated power	93 kW at 2200 rpm
Zone	II 3G IIA T3
Start system	Hydraulic start
Cooling system	Water cooling (coolant)
Coolant type	774F OEM RED, -39°C
Fuel system	Dual filter incl. water separator
Fuel type	EN 590 diesel fuel, (additive recommended when in storage) see JCB User's manual
Fuel consumption	N 225 g / kW / h (@ 2 200 r/min, max load)
Fuel tank	Basement tank, incl. filler breather filter and level gauge
Lubricant type (engine oil)	See JCB User's Manual MOBIL DELVAC 15W40 or equivalent

Air inlet	Dry filter with dust cyclone and safety element. Flame arrestor installed in inlet system
Exhaust	Exhaust gasses cools down by cooling system and Stainless-steel Flame/Spark arrester is in-stalled in exhaust system
Indicators	Engine speed, Water temperature, Exhaust temperature, Oil pressure, Hydraulic oil pressure and Hydraulic oil temperature
Protection against	1. Low pressure (0,75 bar, 10,9 psi) of lubricant 2. High temperature of exhaust gasses, 200°C 3. High temperature of engine(coolant), 100°C 4. Overspeed of diesel engine. 2300 rpm 5. Hand operated emergency stop which is closing the air inlet valve.
Operating temperature	Between -20 °C and +50 °C
Starting temperature	Min -20 °C, Requires Winter or Arctic type fuel, engine oil and hydraulic oil i.e. Neste Oil Neste diesel -29/-34 °C, or better
Storing temperature	-40 °C to +50 °C

Lamor Power pack LPP 95 technical specifications and dimensions

Technical Parameter	Parameter value
Length	1500 mm
Width	2 050 mm
Height	1750 mm
Volume of fuel tank	210 litres
Volume of lubricant for engine	14 litres
Volume of hydraulic oil tank	260 litres
Volume of cooling system	22 litres
Weight	1800 kg dry weight excluding hydraulic oil and diesel fuel
Weight	2300 kg including hydraulic oil and diesel fuel
Color	Lamor colors, Main frame RAL 5010. Doors, tank RAL 1023.

Technical data 10' container

Technical Parameter:	LIP 400
Length	2291 mm (91 in)
Width	2438 mm (96 in)
Height	2591 mm (30 in)
Weight	3500 kg (7720 lbs)
Painting system	EN ISO 12944 C5-M (Marine) EPZnEPPUR200/4- Fe Sa2½ Exteriors: Blue RAL 5010 Interior: Gray RAL 7001

1.13 Cover

The Skimmer is protected by a steel container storage roof with side door for 2 x 10' flat racks.



1.14 Spare parts

Below list of spares is indicative. Note that these are consumables and not all of them might still be available.

- Spare part kit SPK 1 for Oil Transfer Pump GTA 115/GTA 140
- Repair Kit rubber adhesive, for Umbilical Hose LUH
- Spare part kit SPK 1 for Weir Skimmer LWS 1300 Mk II
- Spare part Kit SPK 1 for Brush Adapter for Weir Skimmer LWS 1300 Mk II
- Spare part kit SPK 1 for Hydraulic Power Pack, Diesel LPP 95 DHP Ex Zone II
- Spare Hose Set between LUH and LWS, Hydraulic Hoses SS, Anti static
- Spare Hydraulic Hose Set 10m SS for Umbilical Hose Reel
- Paint repairing kit, 0,5 l primer, 0,5 l top coat and 2 x brush



2. Flow meter



KROHNE UFM 3030 is a universal 3-beam in-line ultrasonic flowmeter for liquids

- Independent of conductivity, viscosity, temperature, density and pressure
- No moving or intruding parts, therefore no pressure loss or wear
- Minimal operational and maintenance costs

UFM 3030 is a 3-beam ultrasonic flowmeter for liquids. UFM 3030 measures independent of conductivity, viscosity, temperature, density and pressure.

Highlights

- Three beams generate a measurement effectively independent of flow profile
- Major performance improvement by applying innovative electronics and digital signal processing (DSP)
- Easy to install and operate
- No moving or intruding parts, no wear, no drift, therefore no additional pressure loss
- No material build-up as unobstructed flow sensor with smooth surface finish
- Insensitive to corrosive or abrasive products

3. Cleaning machines

NILFISK ALTO NEPTUNE 5-51 DE (MH 5M-200/1000 DE) Heavy Duty Professional Diesel Driven Hot Water Pressure Washer

Compact design, high performance and productivity - a simple and efficient cleaning tool.

The NEPTUNE 5-51 DE offers a fully mobile cleaning option powered by a Yanmar Diesel Engine. Ideal for use in the construction or industrial segments and by contract cleaners. Fitted with a high efficiency Ecopower boiler that is 92% efficient, resulting in low running costs and ease of use. A truly portable machine for hot and cold water usages, delivering 900 ltrs/hr water flow at 200 bar max pressure.



Technical characteristics

NEPTUNE DE			NEPTUNE 5-51DE
Motor	Motor Manufacturer and type		Yanmar
	Power	HK/RPM	10/3600
	Fuel type		Diesel
	CCM	Cm3	406
	Fuel tank capacity	Liter	5,5
	Motor RPM, adjusted	RPM	3530
	Pulley size	mm	SPZ 80/3
	Motor oil type		SAE 15/40
	Motor oil capacity	Liter	1,65
Pump	Type		NP5
	Pump pressure	bar	185
	Machine outlet pressure	bar	176
	Water Quantity, high pressure	l/min	13,5
	Water Quantity, low pressure	l/min	15
	Suction capacity (feeded)	meter	3
Heat exchanger	Pump inlet temperature		°C 35-40
	Fuel pressure	bar	10
	Fuel consumption dt = 45°C	kg/h	3,9
	CO ₂ content (min.)	%	10,5
	Soot rating		0
	Efficiency	%	92
	Onboard fuel tank	Litre	57
	Heater rating	kW	81
	Delta T @ working pressure	°C	81
Generator	Type		t16W-75
	Effect	W	1000
	RPM @ HP and Boiler	RPM	2825
	Pulley Size		SPZ 63/1 - 6 Nm
	Belt dimension Motor/Gen.		SPZ 670
Dimensions and weight	Length	mm	970
	Width	mm	780
	Height	mm	1000
	Weight	kg	220
Miscellaneous	Sound power level CE, Lwa	Db	110
	High-pressure hose DN8	m	15
	HP nozzle		0450