

## Annex IV of the VAC

### Technical Specifications for the Vessel/Pool of Vessels

### Enclosed to Procurement Procedure No. EMSA/CPNEG/2/2017 concerning Service Contracts for stand-by oil spill recovery vessels

### Competitive procedure with negotiations

### Phase II - Invitation to Tender

**All the costs related to the adaptation and or upgrade of the vessel capabilities and capacities in line with this Annex and as per below requirements have to be included in the “pre-fitting costs”.**

#### **1. General Description**

The vessel(s) offered must meet the requirements concerning at-sea oil recovery capacity, remote slick detection, oil storage and decantation in dedicated tanks and oil discharging to onshore facilities or any other lightering vessel. If a vessel does not comply initially with the requirements of this technical specification, the company/consortium may include in its bid the necessary vessel adjustments to achieve these requirements (so-called “pre-fitting”).<sup>1</sup>

Capability is needed to deploy two different at-sea oil recovery systems designed to recover medium to high viscous oils:

- The primary system consists of two sweeping arms, one on each side of the vessel;
- The secondary system comprises of boom and a skimmer.

These systems will be installed onboard when operating as an oil response vessel. The sweeping arms, skimmer, booms and ancillary equipment (power packs, compressors, etc.) will be dismantable and able to be stored in appropriate facilities for quick installation and operation in case they cannot permanently be installed onboard. However, in such case comprehensive coverage by canvas or other means must be assured to protect the equipment from dust, dirt, seawater and weather influence/deterioration.

International standardised systems of storage, either 20 or 10 ft containers must be used. The necessary space on deck for storage and deployment of the above mentioned systems must be available. The storage of the full set of equipment during at-sea operations will be made in a safe way with sea fastenings where appropriate.

When flexible hoses are used, they should be kept properly in order to maintain the maximum grade of integrity in shape and shall not be exposed to wear and tear against sharp corners or similar.

The storage capacity for recovered oil must be provided through structural and built-in tanks. The storage tanks, hopper or similar must be free of reinforcements or any other object where oil can remain stuck/blocked as much as possible. The necessary safety devices, such as high level alarms or relief valves, should be installed to comply with the rules of the relevant Recognised Organisation in accordance with Regulation (EC) No 391/2009 and Flag Authorities.

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<sup>1</sup> Where applicable, general reference could be made to the Norwegian Clean Seas Association for Operating Companies (NOFO) standard for oil recovery vessels.

## **2. Location of the Equipment Onboard**

On request the vessel(s) must be able to install on board as a minimum:

- the sweeping arm system,
- the boom system (2 x reel) + offshore skimmer system
- the oil slick detection system,
- other equipment (minilab, cleaning machines, gas detector, flashpoint tester, etc.)

and their relevant power packs and ancillaries.

When planning the location of the equipment on-board, tenderers should consider that the operational requirements for the following configurations should be fulfilled:

- Sweeping arms should be deployed one on each side of the vessel;
- Boom and skimmer: The skimmer should be deployed from the same side as the boom. At least one boom (250 m) should be deployed to perform J-formation where the skimmer should reach the apex of the boom. In order to facilitate this operation it is recommended the skimmer to be forward of the boom.
- Boom: both booms (250 m each) should be able to be connected on board in order to be deployed and perform open U-formation. Accordingly, the necessary space to connect and deploy the booms must be considered, especially when offering booms that need to be inflated manually section by section;
- The necessary space in the bridge should be foreseen for the installation of the Oil Slick Detection System;

In addition, tenderers should take into account the following requirements:

- Crew safety – drip trays for oil recovery devices, or an alternative solution, must be installed in order to keep the deck as clean as possible when involved in oil pollution response activities. In addition, the “dirty areas” will be separated from the “clean areas” as far as possible and any obstacles, like hoses, on deck kept to a minimum;
- The Master must have good visibility from the bridge of the deployment of the equipment;

## **3. Storage Capacity for Oil Recovered at-sea**

The storage capacity of the vessel is one of the key elements of this procurement procedure. In view of the limited “window of opportunity” available to recover oil at-sea, the time spent actually discharging the oil and sailing to and from the discharging facility should be minimised so that the vessel can maximise its time recovering oil. A vessel with a high storage capacity can stay longer recovering oil at-sea making the operation more efficient and avoiding large amounts of oil washing ashore.

Vessels with larger storage capacity will be **preferred**.

## **4. Maximum Speed**

The “window of opportunity” to perform at-sea oil recovery operations is limited in time; therefore, the vessels performing oil recovery activities should be on the spill site as soon as possible. In order to prove the maximum speed, the company/consortium will submit the records of the sea trials of the vessel concerned. If the sea trials records are not available, or are older than 5 years, a statement is needed either from the Classification Society, Flag State or other relevant recognised national institution. If none of these statements is submitted then the maximum speed of the ship must be thoroughly justified, for example by using AIS positions within a certain time. The Agency reserves the right to request any additional document or calculation necessary to ensure that the maximum speed complies with the requirements of this Invitation to Tender and associated enclosures.

The target maximum speed that the vessel is expected to achieve is 12 knots at a continuous rating of the engine(s), although vessels(s) with a speed higher than 12 knots are **preferred**. In general, when the vessel is mobilised and sails to the spill location she is in ballast condition. Accordingly, the maximum speed should be tested under this condition.

#### **5. Speed for Oil Recovery Operations**

The mechanical oil recovery activities, with either the sweeping arms or boom and skimmer systems, are carried out at a very low speed. Consequently the vessels offered shall be able to sail and manoeuvre at very low speeds i.e. less than 1 knot, keeping on course for at least 10 hours.

If the vessel has already installed a Dynamic Positioning system (DP) or electrical propulsion or Controllable Pitch Propeller (CPP) or equivalent where appropriately justified, this requirement shall be considered as being fulfilled. In the case of a conventional propulsion system with a Fixed Pitch Propeller (FPP), the company should justify how the requirement is met.

#### **6. Manoeuvrability**

When operating the oil pollution response equipment systems at low speeds, the manoeuvrability of the vessel is one of the key factors in recovering the oil efficiently and avoiding oil escaping from the containment systems. The vessels offered must be highly manoeuvrable, in particular when operating within a fleet of recovery vessels at the spill site.

If the vessel has already installed bow/aft thrusters or Dynamic Positioning system (DP) or rudder propellers or any other mechanical device which purpose is the improvement of the overall manoeuvrability, the requirement shall be considered as being fulfilled. In other cases the company should either justify how this is achieved.

#### **7. Age**

The age of the vessel will be considered in the evaluation. A vessel which is less than 10 years old is **preferred**.

If the vessel offered is more than 25 years old, or it is reaching 25 years during the contract implementation, then it must follow a Hull Renovation Scheme or equivalent by which the relevant Class Society will issue a Certificate of Hull Renovation indicating that the hull is considered to be in a condition comparable to that of a typical vessel at second special survey (10 years old).

#### **8. Filling and Decanting System**

The oil recovered by either the sweeping arms or skimmer shall be directed to the storage tanks for a gravity separation stage (decanting). The main objective of the process is that, once completed, the tanks are full of hydrocarbons with minimum water content.

The tanks will be pre-filled with hot water at a minimum temperature of 35°C before the oil recovery operation starts.

The recovered oil should be discharged on the top of the tank via a **“drop line”** to facilitate the decanting process. Such a drop line must have a diameter of at least 6 inches. The inlet of the drop line must have a quick coupling system compatible with the hoses of any of the two recovery systems. For safety considerations (to avoid the ignition produced by potential static electricity) the drop lines will only be used when their lower ends are submerged into the hot water. This must be considered when deciding the length of the drop line inside the tank. The drop line must be installed in at least two pairs of tanks where appropriate.

Once the recovered product is being discharged to the tank filled with hot water, the water and oil will be separated due to a density difference. The excess water from the bottom of the tank shall be discharged

over board using the discharging pumps via an **oleometer** which detects the parts per million of hydrocarbon in the effluent. Accordingly, it must be possible to fill the tanks at the same time as excess water is pumped overboard.

In order to have a flexible separation system, the storage tanks should be interconnected, to improve the decantation process of the recovered product.

The company/consortium may offer a different proposal with equivalent performance adapted to the vessel configuration. Such an alternative proposal must be appropriately justified.

In the case of a vessel using a hopper, a system to improve the separation of oil from water will be installed if not existing already.

## **9. Discharging System**

The discharging of recovered oil will be done via a common discharging collector which will be linked to a discharging manifold. Such manifold will have the outlet(s) on deck at a suitable position to discharge to shore.. The discharging collector will have at least a diameter of **8 inches**.

In order to discharge the maximum quantity of oil, the vessel must have a fixed pumping installation. The number and nominal capacity of the pumps will be determined taking into consideration the theoretical calculation that all the recovered storage tanks if full with water would be discharged simultaneously. Accordingly, the offer must indicate the installed discharging capacity in m<sup>3</sup>/h and the maximum simultaneous discharging capacity in m<sup>3</sup>/h considering system limitations, like, for example, the number of pumps and cargo piping that can be used at the time.

The vessel pumps will be capable of handling high viscous oil and will have a discharge pressure of, at least, 7 bar at the nominal capacity.

In addition, the vessel will have at least one spare portable pump of 150 m<sup>3</sup>/h of water at 7 bar or equivalent and a maximum discharging pressure of at least 10 bar. The diameter of the discharging hose for the portable pump will be at least 6 inches.

When the vessel does not have a fixed pump installation, new pumps need to be installed.

Where applicable, the main features of the new pumps will be:

- a. capable of handling high viscous oil;
- b. discharge pressure of, at least, 7 bar at the nominal capacity. suitable for operations in hazardous areas;
- c. low degree of mixing water with oil in order to minimise the formation of oil/water emulsions;
- d. non-clogging characteristic;
- e. not sensitive to debris, no overload risk when the pump is blocked;
- f. compact design and low weight.

The company/consortium may offer a different proposal with equivalent performance adapted to the vessel configuration. Such an alternative proposal must be appropriately justified.

If new piping needs to be installed the following requirements must be taken into account:

- All the inlets/outlets will have a blind flange valve or similar approved by a Recognised Organisation in accordance with Regulation (EC) No. 391/2009.
- The material of will be steel carbon, A106 Grade B or similar.

Vessels with better discharging capacity will be **preferred**.

## 10. Heating System

In order to improve the decanting and discharging processes, the storage tanks shall be provided with an efficient heating system aiming at the following targets:

- The boiler to heat the tanks should have 1kW per m<sup>3</sup> of storage capacity if the capacity of the ship is below 2,000m<sup>3</sup> and 0.75kW per m<sup>3</sup> if the storage capacity is above 2,000m<sup>3</sup>;
- The heat transfer surface of the coils will be 0.18 m<sup>2</sup> per m<sup>3</sup> of storage capacity. The coils may be fixed in the bottom of the tanks, mobile (vertical) or a combination of both systems. In case of portable coils being used the necessary openings on the tanks' tops will be made.

The company/consortium may offer a different proposal to that described above with equivalent performance adapted to the vessel configuration. Such equivalence will be duly justified and motivated. The basis for such a justification should be that the heating system must be able to increase 30°C in 24h a substance with 100,000cst, a specific heat of 3.56kJ/kg °C and a density of 1005kg/m<sup>3</sup>.

Vessels with better heating capacity will be **preferred**.

## 11. Hydraulic System

As described below, most of the equipment will be hydraulically driven:

- a. Rigid Sweeping Arms Pumps, Grating and Adjustable Overflow
- b. Boom Reels
- c. Skimmer(s)
- d. Discharging Pumps
- e. Handling Facilities
- f. Remote Controlled valves, where applicable.

It is up to the candidate to decide how to design the hydraulic system, either by adapting the existing hydraulic system in the vessel to the new requirements or by using portable power packs. In any case, when designing the hydraulic system and associated electrical/diesel power system, it must be taken into account that the discharging pumps and the pumps integrated in the recovery devices must be able to work at the same time.

If hydraulic piping is used on a weather deck, the material used must be stainless steel.

In order to increase the reliability of the system and its redundancy, the hydraulic power must be divided between, at least, two different sources of similar capacity. This will allow the vessel to continue operations in case of failure of one of the hydraulic power sources. In general, it is recommended that each oil recovery system has its own dedicated hydraulic power source and for the purpose of redundancy it is preferred that the different hydraulic power sources are interchangeable.

## 12. Hot Water System for Pumps

As a general requirement all the pumps supplied either within the recovery devices (sweeping arms and skimmer) or as portable pumps for discharging, will be pre-fitted with the appropriate connections (flanges, plugs, etc.) to inject hot water in the inlet and outlet sides (or equivalent where appropriately justified).

The vessel will be able to supply hot water to the sweeping arms pumps and discharging pumps, where applicable, in order to facilitate the flow of high viscous oils. The specifications (temperature, pressure, flow rate, etc.) of the hot water flow will be in accordance with the recommendations of the pump manufacturer.

In order to supply hot water to the pumps the following options are possible:

- a. A separate system which includes all the necessary parts, components and pump sets is made available;
- b. If a new hot water boiler is offered as part of the pre-fitting, the hot water system for pumps can be integrated into it;
- c. Connection to an already existing system on the vessel (e.g. tank cleaning system) and adapted (additional hoses, piping, etc.) to the particular function requested;

The company/consortium may offer a different proposal to that described above with equivalent performance adapted to the vessel configuration. Such equivalence will be duly justified and motivated.

### **13. Steel Works in “Pre-fitting”**

Any steel work needed to place on board and to facilitate the operation of the equipment can be included in the bid as the “pre-fitting” of the vessel, for example:

- a) Foundations for cranes, skimmer, control desks, boom reels, boiler, etc.;
- b) Support frames, platforms, containerlocks and seafastenings for the equipment and containers;
- c) Piping works (including valves) to improve the decanting, filling, discharging, heating or hydraulic system;
- d) Reinforcement of the deck or hull due to the new equipment added;
- e) Drip trays for oil recovery devices;
- f) Rollers/guides for boom deployment.

### **14. Flashpoint**

Vessels that are certified by a Recognised Organisation in accordance with Regulation (EC) No 391/2009 to recover, store onboard, transport and unload products with a flashpoint below 60°C are **preferred**.

In case of non-compliance with the above, the company/consortium may consider the possibility of making adjustments to the vessel as part of the pre-fitting works financed by EMSA.

### **15. Communications**

The vessel must be certified to sail within the Global Maritime Distress Safety System (GMDSS) area A3. The vessel must have an Internet Connection onboard with a bandwidth of at least 512kb/s.

In case of non-compliance with this requirement, the company/consortium may consider the possibility of making adjustments to the vessel within the budget allocated for pre-fitting.

The necessary external communication tools must be in place to exchange information with other ships, onshore stations and surveillance aircraft.

### **16. Accommodation**

When an oil spill occurs, the requesting Member State usually transfers a liaison officer onboard the vessels mobilised. In addition, EMSA may decide to send onboard an observer. Therefore, the vessel must be able to accommodate the crew needed for pollution response operations plus two additional people. The necessary lifesaving appliances onboard must be considered accordingly.