

# MARINER



Enhancing HNS preparedness  
through training and exercising

## TITLE OF THE DOCUMENT

Task D: ANNEX I: GALICIAN  
COASTGUARDS VESSELS  
EQUIPMENT

Action D.1&D.2

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## INDEX

1. Introduction .....	2
2. Vessels: “B/S Sebastián de Ocampo” & “B/S Irmáns García Nodal” .....	3
2.1. General description.....	44
2.2. Search and Rescue Operations .....	7
2.3. Pollution control.....	8
2.4. Protective equipment .....	8
2.5. External fire fighter system.....	9
2.6. Other equipment and systems.....	8
3. Pictures.....	10
4. Equipment suitable for HNS incidents .....	10
5. Considerations for the adaptation to HNS fighting.....	11



## 1. Introduction

The general objective of MARINER is to improve regional cooperation in planning, preparedness and response to HNS spills by improving training and exercise, increasing awareness and information exchange, and by capitalization and translation of HNS relevant R & D projects' outcomes into operational products.

Within the scope of the MARINER project, under action D.2, protocols to respond to HNS incidents will be identified to be included in contingency plans and Good Practices for involvement of key expertise in combating HNS.

The adaptation of response protocols to maritime and coastal scenarios is one of the keys to improving the effectiveness of this response. Emergency teams dealing with accidents involving chemical substances have extensive experience in the field of transport of dangerous goods by land, as well as in the field of chemical industry. However, the experience of incident response teams in coastal and maritime environments is very well adapted to oils spills, the most common incidents but very scarce when dealing with HNS.

Galician Coast Guards have two fully equipped anti pollution vessels to fight with oil spill incidents along the coast of the region. Most of the equipment that is installed in the vessels can be suitable of adaptation to be used in HNS incidents response.

This document gathers information about the evaluation of the equipment of the two anti pollution vessels that can be useful when fighting to HNS spills in coastal areas.



## 2. Vessels: “B/S Sebastián de Ocampo” & “B/S Irmáns García Nodal”

	<p><b>R/S “SEBASTIÁN DE OCAMPO”</b> Length: 41 m Tanks R: 118 m<sup>3</sup></p>
	<p><b>B/S “IRMÁNS GARCÍA NODAL”</b> Length : 39 m Tanks R: 72 m<sup>3</sup></p>



## **2.1. General description**

The vessels were designed for ocean navigation and the following preferential functions: salvage of ships in the Galician fishing fleet or other ships in Galician coastal waters; rescue of human lives; oil spill control and clean-up; control, inspection and surveillance of fishing ships; scientific research; training of certified fishing ship crew members; and training of fishing inspectors and observers. They are also equipped to extinguish fires on other ships and tow ships in distress.

### **General arrangement**

In the design of the general arrangement of the vessels, in function of its assigned duties, the space designated to the auxiliary craft operating system was given great importance. Special attention was also paid to the design and composition of the accommodation spaces to enhance the quality of living conditions aboard ship. The ships are arranged with two decks, main and upper. The hull forms are those of a high speed fishing vessel with a bulbous bow and a stern ramp. Accommodation for a permanent crew of nine is arranged, including five cabins with individual wash rooms. Space for a higher temporary crew, as well as for castaways, is also provided up to 20 people in the case of “Sebastián de Ocampo” and up to 18 people in the “Irmãos García Nodal”.

### **Propulsion, speed and manoeuvrability**

The propulsion system on board the vessels comprises two power packs, each consisting of a main Caterpillar of a 1865 Kw each (5000 HP). These engines are derived from the 3500 family. The cylinder stroke has been lengthened from 190 mm to 215 mm, which explains the letters HD (high displacement) in its model name. The 170 mm bore remains the same. The result is a total piston displacement of 78 liters,



with a 16-cylinder in V configuration. From a PTO on its forward end, the port-side unit drives a FiFi pump for external FiFi services. The pump supplies water to the monitor installed on the wheelhouse roof. A Reintjes model LAP-862 clutchable reduction gear; of a reduced ratio of 5:5:1 and a vertical step of 540 mm, is fitted to the aft side of each engine. Each reduction gear is equipped with a 700-kW @ 2370 rpm PTO with a clutch (PTO K51). Through two shaftlines, one per engine, each of the propulsion units drives its respective 2,6-m diameter. Baliño-Kamewa controllable-pitch propeller rotating at 300 rpm.

### **Auxiliary machinery**

The vessels are equipped with two generating sets, each formed by Guascor marine diesel engines with a power rating of 270 CV at 1500, each connected through a resilient coupling to a 230-KVA Stamford alternator. The ships are also fitted with a harbour genset, consisting of a 74,8-CV Deutz diesel engine driving a 55-KVA alternator. All the pumps, are dimensioned to provide adequate service to the systems, machinery and equipment to which they are connected.

### **Wheelhouse**

The wheelhouse is expansive and has full-horizon visibility (360°). The wheelhouse equipment includes the following:

#### Navigation

- 1 SOLAS 25 kW X-band ARPA radar
- 1 30 kW S-band ARPA radar
- 1 satellite compass
- 1 giro compass 2 automatic pilots
- 2 giro repeaters



2 SOLAS GPSs

1 SOLAS depth finder

1 Doppler log

Navigation software (MaxSea)

1 AIS

1 anemometer

1 weather chart facsimile receiver

1 directional receiver

Area A-3 GMDSS station

1 SSB 400 W radio telephone

1 HF/MF DSC module

2 VHF/DSC radio telephones 2 Std-C Inmarsat receivers

1 Navtex receivers 1 satellite radio beacon 2

radar transponders

3 band held radio telephones

#### Fishing and search function equipment

1 162 kHz hull sonar

1 28-50 kHz, 10 kW depth finder

1 bathymetric chart generator (MaxSea)

1 directional radio HF/MF receivers

#### Non-GMDSS communication equipment

1 Inmarsat-F station for high speed telecommunications

1 Inmarsat Mini-M station

1 Iridium global-coverage satellite telephones 1 Iridium aerial-band VHF radio telephones 1

AOR scanner receivers





A SOLAS radar, a multifunction display, navigation software and other communication units are fitted at the Command and Control Centre.

### **Deck Equipment**

The vessels are equipped with a complete set of deck machinery including the following elements:

- 1 200 kW dual towing/stern trawling winch, with capacity for 700 m of 40 mm cable or 800 m of 46 mm diameter rope
- 1 80 t, fast release type towing winch with slewing support
- 1 cod end hauling and stern manoeuvre winch
- 1 pot and gillnet hauler
- 1 winch for stowage of scientific equipment, with capacity for 4000 m of 8 mm diameter cable
- 1 oceanographic winch, with capacity for 4000 m of 12 mm diameter stainless steel cable
- 1 stern mooring winch
- 1 20-t x m stern hydraulic crane
- 1 stern davit
- 2 windlasses
- 2 vertical capstans

## **2.2. Search & Rescue Operations**

Due to the heavy ship traffic in Galician waters, the vessels are required to serve as the one on-site command station for incidents in those waters. For that purpose they are fitted with a Command and Control Centre from which all the means involved are coordinated, including helicopters, rescue boats and any other craft or means deployed in such operations. To assist in locating missing persons, the vessels are



equipped with a Sea Flir II night search unit, an innovative infrared system for spotting and tracking castaways.

A recovery zone for survivors is located as low as possible on each side of the ship, in order to facilitate boarding unconscious victims. Two 7.3 m maritime partner rescue boats, fitted with water jet propulsion powered by a 230 C engine are stowed aboard each vessel. The boats are lowered by means of two Ferri davits.

### **2.3. Pollution Control**

The vessels are equipped with a wide range of means for marine pollution control and cleanup, which include an infrared pollution-spot detector (the same system that detects castaways). Three hundred m of floating barrier for containing oil spills are stowed aboard each vessel. Other elements include absorbent material, and systems for cleaning the storage tanks and pollution control equipment. Both vessels always carry a large amount of absorbent material on board for use if necessary.

The ships also carry a disc skimmer of 50 t/h capacity for recovering light/medium, weight fuels. An additional 12 t/h disc skimmer for light fuels is also kept aboard ship. Six flexible floating waste tanks, each of a capacity of 20 t, are installed. Once filled they are easily removed to shore for unloading.

### **2.4. Protective equipment**

Vessel crews and response teams have access to Personal Protective Equipment (PPE). This equipment comprises both protective clothing and respiratory protection.



Protective clothing includes:

single-use clothing reusable  
clothing

SOLAS/Silver fire suit 2 pieces

gloves boots goggles

helmets ear protection

MICROCHEM® 3000 is one of the lightest and most comfortable chemical protective garments on the market today. Featuring a soft and flexible 3-layer fabric, strong ultrasonically welded seams and an effective chemical barrier against most inorganic chemicals. Highly visible - Bright yellow for improved worker safety . Anti-static - Tested according to EN 1149-5.

Respiratory protection:

Self-contained breathing apparatus (SCBA)

Detectors:

Vessels are equipped with gas detectors model Dräger am-x2500

## **2.5. External Firefighting system**

The external fire fighting system consists of the following elements:

A pump of a flow of 1200 m<sup>3</sup>/h at 13 bar, powered by a sport-side propulsion engine, with an electric clutch and connected by means of a resilient coupling.

A water monitor of a flow of 1200 m<sup>3</sup>/h at a 1230 m reach and a 50 m height, located on the wheelhouse roof, with a remote control system on the monitor by means of electro hydraulic motors controlled by joystick.



## 2.6. Other Equipment and Systems

The vessels accommodated a permanent crew of nine, but additional accommodations for a maximum of twenty is ready available.

The laboratories installed aboard ship are connected by means of two separate cable conduits linking them together and to the relevant deck elements. They are also connected to the onboard mainframe and inter-com system.

## 3. Pictures

A complete library of pictures from both vessels is available in the web of the project.

## 4. Equipment suitable for HNS incidents

The equipment of the vessels is suitable to be used in HNS incidents in the different steps of the operational response:

**Forecasting:** the TIC equipment available on the vessels allows maintaining contact with the forecasting system of the regional contingency plan (XesCamgal) in order to continuously update the situation. That forecasting includes forecasting of the spread in air, spread on the water surface, in water body and if model available, the spread of chemicals that sink.

**Monitoring:** by three ways:

- observations by trained people,
- use of drifting buoys depending on the HNS involved in the contingency
- use of gas detectors to monitor the atmosphere in the area

**Response by:**

- knocking down water soluble gas clouds by using waters monitors of the firefighting system



- reducing vaporizing and risk of fire and explosion by covering with foam the substance spilled and that is floating on the water surface
- containing the spilled HNS by booms and recovering using the skimmers
- containing the spread of the substance and recovering of it by the use of sorbent booms and sorbent plates and pillows
- combating spills that dissolve in water by using treating agents under the supervision of competent authorities, in order to reduce deleterious effects on humans and environment
- combating spills that sink to the bottom through the sub aquatic team

## 5. Considerations for the adaptation for HNS fighting

Both vessels are fully equipped for oil spill contingencies but they are not used to deal with HNS contingencies. Nevertheless most of the equipment can be used in HNS spills right away taking into account HNS fighting specificity.

There are several shortcomings that need to be addressed in order to combat HNS discharges. Mainly focused on:

- Improvement of the PPE equipment that needs to be suitable for HNS environments. In these sense new equipment has been acquired including protective clothing type I.
- Training, the second shortcoming to be addressed is the training of the crew, development of exercises are crucial to be ready for real situations.