



M/T MONTE ARUCAS



Call Sign: **E A U P**
 Port of Registry: **St. Cruz Tenerife**
 Flag: **Spanish**
 IMO Number : **9494981**
 Delivery Date: **24-July-2009**
 Builder: **Cardama, Vigo, Spain**

GENERAL

- ▶ Keel Laid : 11 September 2008
- ▶ Delivery : 7 July 2009
- ▶ Gross Ton 1786, Net Ton 1127
- ▶ Class : BUREAU VERITAS, +DOUBLE HULL, I & HULL & MACH - OIL TANKER ESP – FLASH POINT > 60°C; OIL RECOVERY SHIP – FLASH POINT > 60°C + UNRESTRICTED NAVIGATION + AVM-APS; +AUT-UMS; +SYS-NEQ-1; +MON-SHAFT; +CLEANSHIP; INWATER SURVEY
- ▶ Length (overall): 79.95 M
- ▶ Length (between pp): 78.68 M
- ▶ Breath (moulded): 15.00 M
- ▶ Depth (moulded): 5.25 M

MACHINERY

MAIN ENGINE:

- ▶ 2 x Guascor SF-240TA-SP 1074 Kw 1800 r.p.m.

AUX. ENGINES:

- ▶ 2 x Deutz BF 6M 1013MC 147.6 Kw x 1500 r.p.m
- ▶ 2 x Guascor SF180TA SG 387.6 Kw x 1500 r.p.m.

AUX. BOILERS:

- ▶ 1 x Gesab Göteborg thermal oil boiler Model TOH. Capacity 1800 Kw; Supply Temperature 200°C; Pressure: 7 bar
- ▶ thermal oil flow 84.3 m³/h

PUMPS

FUEL OIL CARGO PUMPS:

- ▶ 3 x Electrical Driven Deepwell Hamworthy DL 132d/150.
- ▶ Capacity: 250 M³/h x 100 MWC

DIESEL OIL CARGO PUMPS:

- ▶ 2 x Electrical Driven Deepwell Hamworthy DL 100c/100.
- ▶ Capacity: 100 M³/h x 100 MWC

SHIP EQUIPMENT

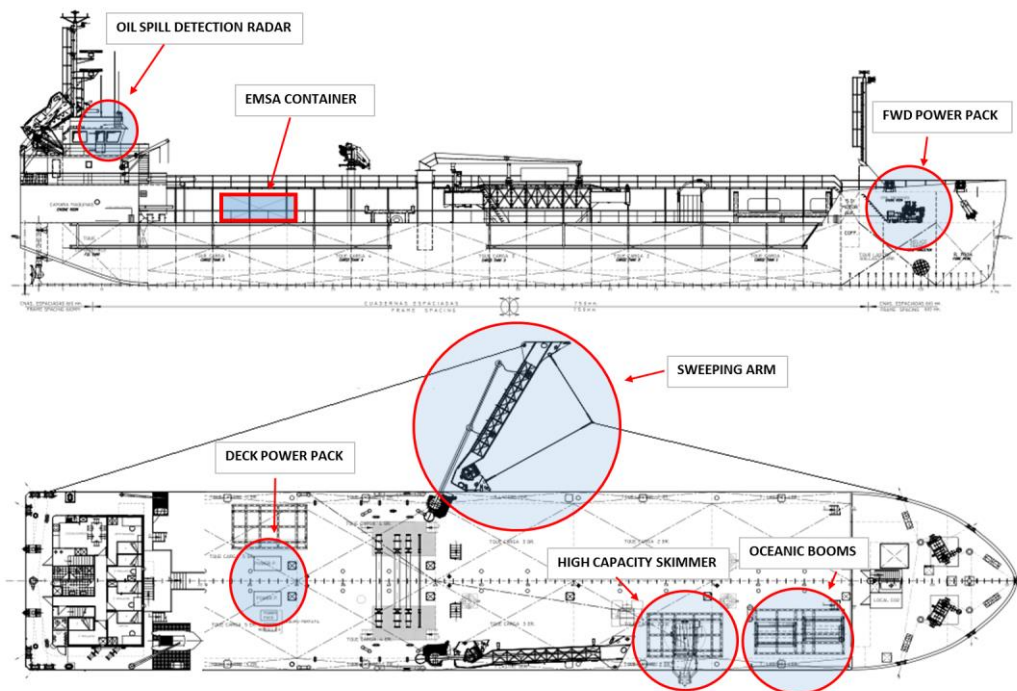
- ▶ Hose handling Crane: 1 x FASSI Telescopic Electro-Hydraulic, Model: F275 A.2.28.
- ▶ Bow thruster: Baliño B5M-355-LB4; Diam. 1.30 M; 4 blades; Power 350 Kw.
- ▶ Propeller: *Schottel* 2 x 4 Blades, Rudder-propeller, variable pitch. Diameter: 1400 mm
- ▶ Anchor : 2 x HALL TYPE A; 2128 KG;
- ▶ Windlass : J&L Carral; Model CHA1/R/20/30 de 48 T – 15 mt/min
- ▶ Mooring Winch : J&L Carral 48 T – 15 mt/min.
- ▶ Counters: FO Isoil Impianti Type LMB 3000 – 1500/15000 lt/min. D.O. Isoil Impianti Type LMB 1000 – 700/7000 lt/min

CARGO TANK CAPACITY

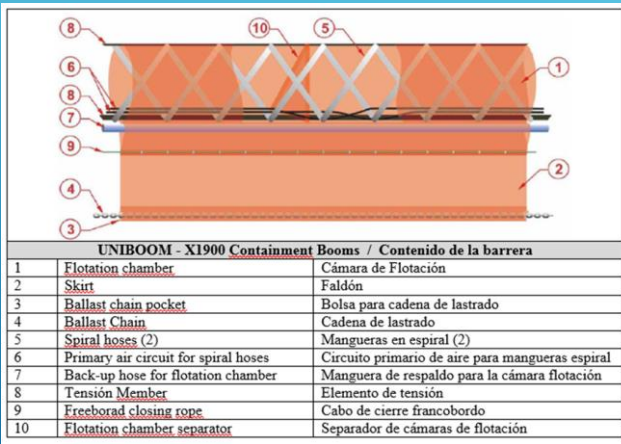
IDENTIFICATION	FRAME	CAPACITY (M3)
DIESEL OIL TANK 1 STBD	75-90	298,975
DIESEL OIL TANK 1 PORT	75-90	298,975
FUEL OIL TANK 2 STBD	60-75	298,975
FUEL OIL TANK 2 PORT	60-75	298,975
FUEL OIL TANK 3 STBD	45-60	298,975
FUEL OIL TANK 3 PORT	45-60	298,975
FUEL OIL TANK 4 STBD	30-45	298,975
FUEL OIL TANK 4 PORT	30-45	298,975
FUEL OIL TANK 5 STBD	15-30	298,975
FUEL OIL TANK 5 PORT	15-30	298,975
TOTAL FUEL OIL CAPACITY		2391,8
TOTAL DIESEL OIL CAPACITY		597,95
GRAND TOTAL		2989,75

OIL RECOVERY EQUIPMENT

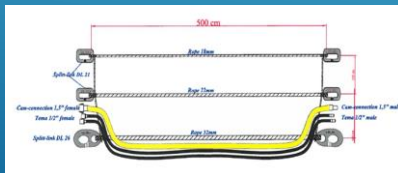
- ▶ Oil Spill Detection Radar. *Miros* – Type : JH 19T14 MMD 190.0 inch maritime multi display with high resolution marine X-band radar.
- ▶ Two (2) KOSEQ Rigid Sweeping Arms with brush conveyor and pumping arrangement with MSP 150/63 Pump.- Capacity 300 m3/hr per Arm.
- ▶ One (1) *Lamor* LWS 1300 Free Floating offshore Skimmer. Capacity 250 m3/hr and one umbilical hose reel with telescopic crane arm LTU with radio remote control.
- ▶ Two (2) Oceanic Oil Booms oil booms of 250 mtrs each – UNIBOOM X1900
- ▶ Power Pack for Oceanic Booms & Skimmer : 2X90 Kw
- ▶ Backup or Power Pack for Sweeping Arms : 2x126 Kw
- ▶ Portable Power Pack + Compressor to maintain Booms in “Open U” formation: 36 Kw



OCEANIC UNIBOOM X1900 & ASSOCIATED STORAGE REELS



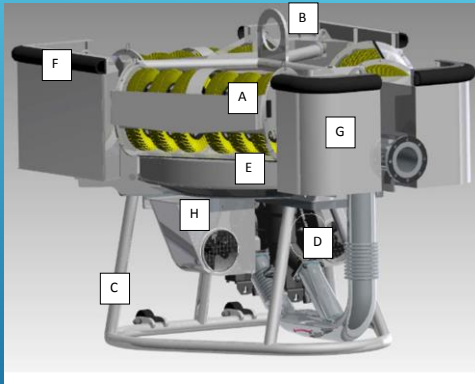
Physical Parameters / Características Físicas		
Freeboard operational	Francobordo operacional	740 mm
Draft	Calado	1160 mm
Boom Height	Altura de la barrera	1900 mm
Skirt Material	Material	PVC – coated polyester(1400 g/m2)
Buoyancy / weight ratio	Rato flotación/peso	28:1
Weight	Peso	19 kg/m
Operational Requirements / Requerimientos operacionales		
Air pressure, primary spirals	Presión aire espirales primarias	Min 5/75 bar/psi
Maximum wave height	Altura maxima de olas	5 m
Maximum wind force	Maxima fuerza del viento	20 m/s
Towing speed (relative to water)	Velocidad de remolque (sobre el agua)	1 Knt
Maximum towing force	Maxima fuerza de remolque	60 kN



ROPES / HOSES CONNECTION

“OPEN U” FORMATION

HIGH CAPACITY WEIR SKIMMER LWS 1300



- A – Brush Module component (3 pcs.)
- B – Central Lifting Point
- C – Flotation Frame (Marine grade aluminium)
- D – Pumps GTA 140 and MSP 150
- E – Weir\Hopper (Marine grade aluminium)
- F – Fender (rubber)
- G – Floats (Adjustable, marine grade aluminium)
- H – Thrusters (2 pcs.)



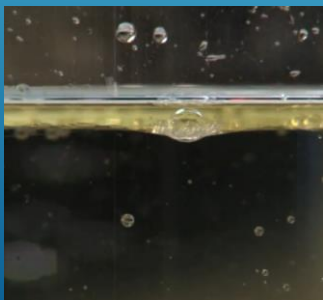
WEIR SKIMMER



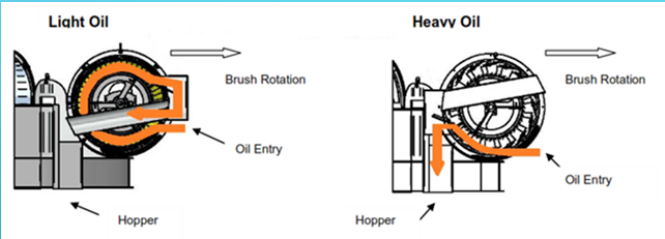
SKIMMER WITH BRUSHES



	Group 1 Gasoline, Kerosene, Light crude oils	Group 2/3 IFO 180, most of crude oils	Group 4 IFO 380, Heavy crude oils
API – Specific Gravity	API >45 s.g. <0,8	API 45-17,5 s.g. 0,8 – 0,95	API <17,5 s.g. > 0,95
Pour Point	-13°C .. -66°C	23°C - -30°C	> 30° C
Viscosity	< 3 CSt	4 CSt - semisolid	1500 CSt - semisolid
% boiling (200°C)	> 50%	10% - 50%	< 25%



BRUSH MODULE SETTING
DEPENDING ON OIL VISCOSITY



GTA 140

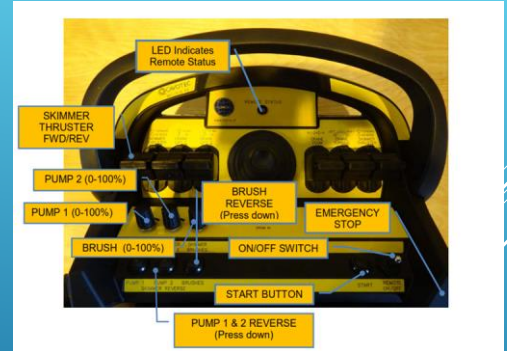


MSP 150



SWITCHING PUMPS BETWEEN GTA 140
(HEAVY OILS) AND MSP 150 (LIGHT OILS)

UMBILICAL HOSE REEL



RADIO REMOTE CONTROL UNIT

ASSESSMENT FOR SKIMMER SET UP

- ❖ Recovery options at sea should be assessed against prevailing sea state, wind currents, type of oil recovered and viscosity at ambient temperatures.
- ❖ Skimmer efficiency is the relation between water and oil recovered. It must be minimized water amount, selecting conveniently skimmer set up and operating it correctly.
- ❖ Brush Skimmer set up is more effective to recover high and medium viscosity Oils (100-2000 centistokes). Low viscosity products do not accumulate sufficient thick layers and it is better to use Weir skimmers.
- ❖ Weir skimmer is very effective in calm waters because weir lip must be positioned at, or just slightly below the surface.
- ❖ Brushes can be clogged by debris. Install brush module in the most effective position, and use discs for high viscosity oils.
- ❖ Skimmer performance should be continuously monitored to ensure optimum efficiency.

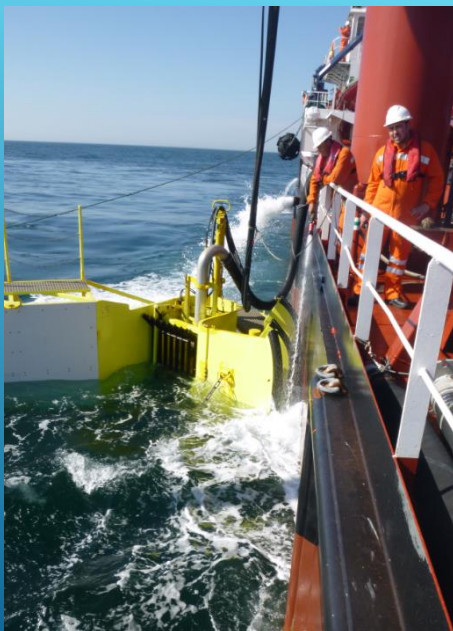
RIGID SWEEPING ARMS WITH ASSOCIATED CRANES

Overall length	15,15 mts
Sweeping arm weight	4,800 kgs
Pumping capacity	300 m3/h
Condition allowance	Max Wind Beaufort 4
	Max vessel speed 3-4 knts

- ❖ Recovery options at sea should be assessed against prevailing sea state, wind currents, type of oil recovered and viscosity at ambient temperatures.
- ❖ The sweeping arms must be set correctly towards shipside hull. The height of the sump must be adjusted for maximum efficiency avoiding suction of excessive water.

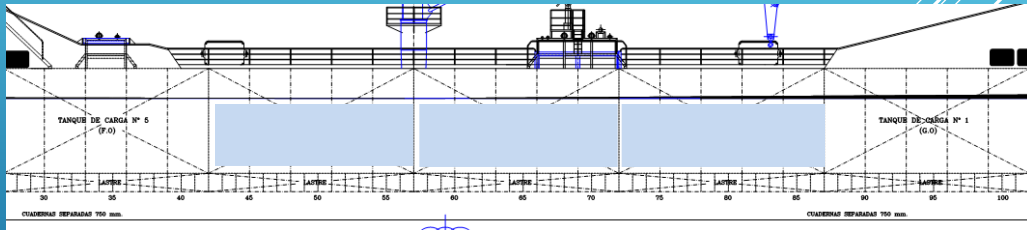


SWEEPING ARM DEPLOYMENT



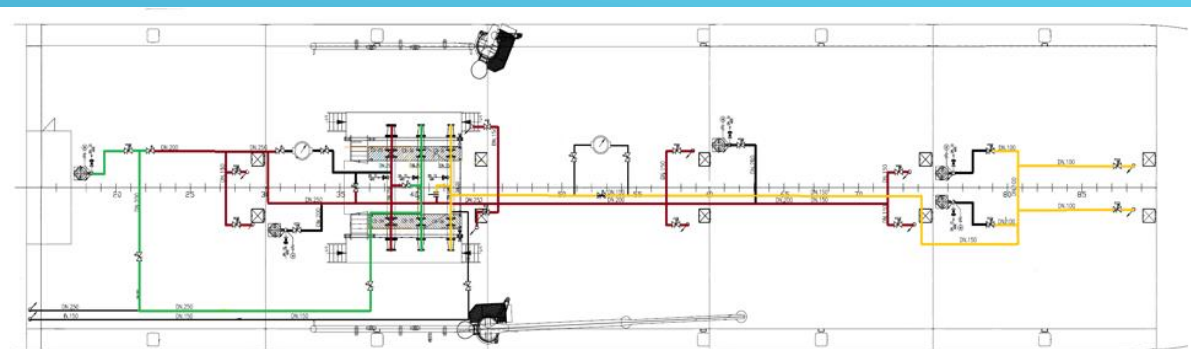
ARRIVAL CONDITION

- ❖ Cargo tanks N°2 (P+S), N°3 (P+S) y N°4 (P+S) filled with sea water up to 65%. Sea water should be heated to reach at least 40 degrees celsius for easy decanting.



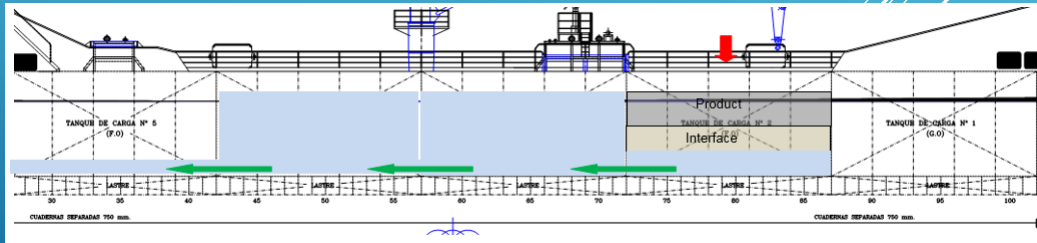
- ❖ Vessel has individual loading pipes fitted at the top of each tank, and all tanks are connected with bottom free-flow valves.

OIL RECOVERY PIPING DIAGRAM

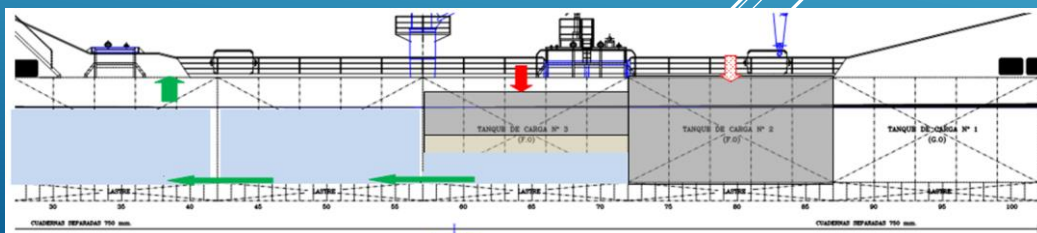
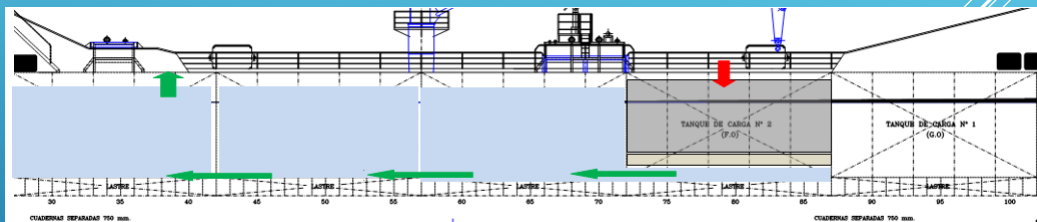


- Loading 1P+1S // Cargar 1P+1S
- Loading 2P+2S+3P+3S+4P+4S+5P+5S // Cargar 2P+2S+3P+3S+4P+4S+5P+5S
- Discharging excess water from 5P through oil meter // Descarga del exceso de agua del 5P a través del oleómetro

- ❖ Start loading into N°2 (P+S) up to 80% and then open free-flow valves to tanks N°3 (P+S) and N°4 (P+S).
- ❖ Open the valve to N°5 (P+S), passing the decanted water as necessary to maintain 80% level in N°2-3-4 tanks.



- ❖ As soon as tanks N°5 (P+S) level reach 80 % of capacity, start the pump to discharge decanted water to the sea through the oil content meter (ODME).
- ❖ While maintaining level of tanks N°5 (P+S), continue loading cargo tanks to full capacity.



MIROS OSD SLICK DETECTION SYSTEM



- ❖ Miros OSD takes data input from x-band navigation radar together with wind, GPS and compass and performs signal processing that produces oil spill detection.
- ❖ The OSD system captures, processes and displays sea surface backscatter data. The radar BSI (Back Scatter Intensity) depends on the roughness of the sea surface caused by the wind generated waves, and is therefore ultimately a function of wind speed.
- ❖ The system will not operate when there is no wind because waves are not present on the sea surface. Above a certain wind threshold, breaking waves will disperse oil from the sea surface and oil can no longer be detected. This tends to happen at wind speeds in the region of 20-30 knots.

