**Protector Task List for LSA**

1. **Provision of Berth, Safe Access and Shore Power**
	1. Provision of suitable alongside berth for HMC Protector, with safe access for crew and contractors.
	2. Provision of suitable safe brow access complete with safety nets, with protective matting to protect its landing on the Cutter’s deck / structure.
2. **Provide Protective Floor Covering**
	1. Non-slip protective floor covering is to be laid in areas as detailed to below. The protective flooring is to cover the entire area and in passage ways and through routes, the skirt of any vertical surfaces is also to be protectively covered to a height of 0.3 metres.
		1. Office including stair lobby;
		2. Mess deck;
		3. Forward Accommodation Passageway
		4. Lower Accommodation Passageway
		5. Stair way x 3 (MCR to Mess deck, Mess deck to Office & Office to W/H)
	2. Task content is to include: -
		1. Re-securing, repair or renewal of the material where loose damaged or excessively fouled;
		2. Removal and disposal of the material at the end of the LSA / docking period; and
		3. Localised cleaning of any arising or fixing methods
3. **Clean and Survey Coatings / Structure of Chain Locker**
	1. Open the chain locker’s access hatches.
	2. Ventilate and obtain a gas free certificate.
	3. Thoroughly clean the chain locker.
	4. As necessary move cable bins / protective cladding.
	5. Along with the International Paint Representative carry out a comprehensive survey / inspection of the chain lockers’ structure and paint coatings. Submit survey / inspection report and agree any work to be carried out with Border Force Overseeing Officer.
	6. On completion of any repairs to structure and coating, re-secure cable bins / protective cladding and present space to the Border Force Overseeing officer.
	7. Verify function of chain locker drain and correct operation of closure valve.
		1. Check operation of semi rotary pump.
4. **Port Fresh Water Tank (MV11P) Open, Clean & Survey Coatings / Structure**
	1. Open up the Port Fresh Water Tank (MV11P), ventilate and obtain a gas free certificate.
	2. Thoroughly clean with fresh water and drain arisings.
	3. Along with the International Paint Representative carry out a comprehensive inspection of the tanks paint structure. Agree any work to be carried out with Border Force Overseeing Officer.
	4. Assure all rags and arisings have been removed.
	5. On completion of any coating repairs, present the tank to the BFOO. Immediately on completion of inspection the manholes are to be re-fitted (using new gaskets).
	6. When manhole covers are in place a pressure test to 1.5 psi.

1. **Starboard Fresh Water Tank (MV11P) Open, Clean & Survey Coatings / Structure**
	1. Open up the Starboard Fresh Water Tank (MV11S), ventilate and obtain a gas free certificate.
	2. Thoroughly clean with fresh water and drain arisings.
	3. Along with the International Paint Representative carry out a comprehensive inspection of the tanks paint structure. Agree any work to be carried out with Border Force Overseeing Officer
	4. Assure all rags and arisings have been removed
	5. On completion of any coating repairs, present the tank to the BFOO. Immediately on completion of inspection the manholes are to be re-fitted (using new gaskets).
	6. When manhole covers are in place a pressure test to 1.5 psi.
2. **Super-Chlorinate & Provide Certificate of Potability**
	1. Super-Chlorinate both fresh water tanks.
	2. Press the tanks up.

6.3 Run water through ALL taps, hoses and shower heads: ensuring that the super-Chlorination concentrate levels are monitored and maintained.

* 1. De-chlorinate the freshwater tank: run through ALL taps, hoses and shower heads.
	2. Drain down the system & the tank.
	3. Re-fill up FW tank, take water samples and submit the water samples for analysis of pot ability.
	4. Provide a certificate of potability upon completion of satisfactory test. Report any failures immediately to the Border Force Overseeing Officer.
		1. Note 1: Failure will require re-super-chlorination and test until acceptable test standards are achieved.
		2. Note 2 :- Tasks completion should be planned such that certificate of potability is provided in plenty of time before the vessel leaves the shipyard.
1. **Touch-up Painting**
	1. Provision of 120 hours labour to rub-down, clean, degrease and re-paint external paintwork as directed by the Border Force Overseeing Officer.
	2. Painting is to be carried out in accordance with onboard International Paint Repair Specification.
		1. Note: International Paint products to complete this task to the repair specification are to be supplied by the Contractor.
2. **Both PME and SME to Gearbox Alignment Check**
	1. The 4 off Port Main Engine Resilient Mounts are to be: -
	2. Visually inspected for failure of the rubber insert;
	3. Dimensional check of all four engine mounts are to be made to ensure the requisite loaded heights 132.5 mm nominal are in accordance with the manufacturer's recommendations;
	4. The gearbox holding down bolts are checked to ensure they remain torqued manufacturers specified torque.
	5. The engine mount fixing bolts are checked to ensure they remain torqued to manufacturers specified torque ; and
	6. The buffer screw mounting height is verified as correct in accordance with the manufacturer’s recommendations.
	7. Provide a written report on the engine mount heights and condition to the Border Force Overseeing Officer.
	8. The main engine to gearbox alignment is to be laser checked and adjusted by:
	9. Removal of the Cardan shaft from the main engine flywheel & gearbox drive couplings;
	10. Installation of the Border Force supplied alignment jig components;
	11. Check the alignment by measurement and provide written report;
	12. Border Force Overseeing Officer to visually sight and check alignment:
	13. Removal of the alignment jig components to be re-stowed in the Border Force supplied transport box with assured returned to Border Force custody;
	14. Re-install the Cardan Shaft and tighten the securing bolts to 1,000 Nm.
	15. The alignment check is to be carried out by Border Force’s preferred Contractor:

EMHA,

Ringdijk 520A,

Postbus 54,

2980 AB Ridderkerk,

The Netherlands

Tel: +31 (0) 180-48 43 43

Fax: +31 (0) 180-41 85 81

e-mail: info.emha@ham-groep.nl

Website: [www.emhabv.nl](http://www.emhabv.nl)

1. **Check both PME and SME Engine Resilient Mounts**
	1. The 4 off Port Main Engine Resilient Mounts are to be: -
	2. Visually inspected for failure of the rubber insert;
	3. Dimensional check of all four engine mounts are to be made to ensure the requisite loaded heights are in accordance with the manufacturer’s recommendations of 132.5mm Nominal
	4. The main holding down bolts are checked to ensure they remain torqued to 220Nm
	5. The engine mount fixing bolts are checked to ensure they remain torqued to 72 Nm; and
	6. The buffer screw mounting height is verified as correct in accordance with the manufacturer’s recommendations of 3.1mm
	7. Cushymount Mini ‘K’ Trelleborg Part Number 17/1921: Installation details
		1. Fitting Bolt size & Thread Pitch M16 x 2
		2. Recommended Tightening Torque 72Nm
		3. Test Load – Marked on Mounting 50 kN
		4. Buffer Gap Measured Horizontally 3.1mm
		5. Washer Size M30
		6. Centre Bolt Tightening Torque 220Nm
	8. Provide a written report on the engine mount heights and condition to the Border Force Overseeing Officer.
2. **Inspect both PME and SME Vulkan Coupling**
	1. Flywheel coupling guards are to be removed.
	2. The coupling is to be inspected for damage, excessive torque wear, mis-alignment etc., as follows: -
	3. Inspection to be carried out by a Vulkan coupling service engineer or an approved agent. Arrangements for the Vulkan service agent inspection can be made with: -

Vulkan Industries Ltd,

Archer Road,

Armytage Road Industrial Estate,

Brighouse,

West Yorkshire,

HD6 1XF

Tel 01484 712273

Fax 01484 721376

* 1. This task is to be carried out in Conjunction with PME & SME Gearbox Alignment Check.
	2. Advise the Border Force Overseeing Officer of any defects / evidence of degradation found giving them the opportunity to sight.
	3. Replace guards on completion of all related work.
	4. On completion a written report is to be provided to the Border Force Overseeing Officer by the Vulkan service engineer.
1. **Service Atlas Copco LT 75 Start Air Compressors**
	1. The Atlas Copco Start Air compressors are to be serviced in accordance with the manufacturer’s recommendations.
	2. Provide a written report on condition found to the Border Force Overseeing Officer.
2. **Service & Test or Replace PRVs (x 2)**
	1. Replace Start Air Reservoir PRVs (x 2) set @ 30 bar.
	2. Provide two copies of Certification of pressure setting specific to each PRV.
3. **Open the P & S Gearboxes for Inspection of the Gearwheels**
	1. This service is to be completed by an approved Moventas service agent.
	2. The Moventas service engineer is to carry out the following: -
		1. Annual external inspection; and
		2. Open the Inspection plates and carryout an internal inspection of the pinions and gearwheels in accordance with Moventas maintenance service routines.
	3. On completion, a Moventas Service Report is to be provided to the Border Force Overseeing Officer.
4. **Pressure test Gearboxes' Danfoss Sensors**
	1. In conjunction with Task P212.01.002 Annual Inspection of Gearboxes by Moventas Service agent, test and adjust (as necessary) all Danfoss Sensors on both gearboxes.
	2. Check the Automatic temperature control of the gearbox
	3. Check the automatic shutting down of the main engine if insufficient lubricating oil pressure
	4. Operation of remote control indicators
	5. Alarm devices
	6. Automatic switch over of pumps
	7. Provide an engineer’s report on all results and settings.
5. **Clean & Inspect Heat exchangers (P&S)**
	1. Drain down the system, remove the Alfa Laval Gearbox Plate Coolers and take to a shore side workshop.
	2. As directed open one section of the sea water cooling supply or return piping immediately adjacent to the cooler, for the Border Force Overseeing Officer to inspect.
	3. Strip down the plate coolers and digitally photograph the condition of the plates and give the Border Force Overseeing Officer an opportunity to sight before cleaning is commenced.
	4. Thoroughly clean and inspect the cooler plates.
	5. Re-assemble the Plate Coolers using all new gaskets and seals and pressure test.
	6. Report all defects found to the Border Force Overseeing Officer.
	7. Re-install the plate coolers on each Gearbox.
6. **Check Steering Gear Electrical Installation**
	1. Carry out visual and physical inspection of the Port & Starboard steering Gear installations checking for: -
	2. Hydraulic leaks;
	3. Wear on Hydraulic Hoses;
	4. Tightness / security of linkages & connection; and
	5. Inspect tank anti-vibration mounts.
		1. Note: there are two electronically linked Steering Gear installations and each installation has two motors and consequently two starters.
	6. Clean Inspect & Test Four (4) Motors as follows: -
		1. Isolate power supply to the port and stbd electric pump motors;
		2. Clean the motor and the interior of the terminal box. Inspect the wiring, components and insulated surfaces for damage, deterioration and overheating: tighten electrical connections as necessary;
		3. Inspect earth bonding arrangements, measure & record earth bonding continuity resistance. Reading should not be greater than 0.05 Ohm;
		4. Measure & record insulation resistance. Minimum acceptable reading is 10 Mega Ohm; and
		5. Function test the motor and assess the condition of the bearings.
	7. Clean, Inspect & Test Four (4) Starters as follows: -
	8. Open the panels and clean the interior using a soft brush and vacuum cleaner;
	9. Inspect the interior for damage, deterioration and overheating of the cables and components;
	10. Check electrical connections and tighten as necessary;
	11. Inspect contacts for wear and renew as necessary;
	12. Inspect earth bonding arrangements, measure & record earth bonding continuity resistance. Reading should not be greater than 0.05 Ohm; and
	13. Test current overload devices and check overload alarms.
	14. On completion of all work, restore power supply and function test the foot switch.
	15. Supply written condition report
7. **Scania D11 Diesel Engine & ZF Gearbox: Annual maintenance**
	1. Check the condition of the flexible coupling element and the mounting bolts.
	2. Change the lubricating Oil and filter.
	3. Clean the lube oil cleaner.
	4. Replace the zinc anodes.
	5. Check condition of the ‘keel cooling’ water pump impellor;
	6. Drain down the ZF gearbox lube oil;
	7. Change the ZF gearbox lube oil filter;
	8. Fill the ZF gearbox with Castrol MHP 153
8. **Azimuth Drive HRP Unit Annual Service & Check**
	1. Carefully inspect the Holland Roerpropeller HRP 310-50 Unit checking condition of: -
	2. Hydraulic hoses:
	3. Security of protective cages; and
	4. Indication of any damage or defect.
	5. With the Scania engine running carry out a function test, checking locally for leaks or indication of other defects when operated.
	6. Check operation of thermostat in inclusion of the keel cooling system at the correct temperature.
	7. Thoroughly clean externally and lubricate / grease in accordance with the manufacturer’s recommendations.

1. **Check Azimuth Drive Carden Drive Shaft**
	1. Check the condition and shaft tolerance of the U/J flexible joints components and check the tolerance of the mounting bolts.
	2. Check the torque of the mounting bolts.
	3. Inspect and measure the carden shaft spline clearance.
	4. Provide a report giving results of measurements.
2. **Clean and inspect GS Pump Motor**
	1. Clean Inspect & Test GS Pump Motor: -
	2. Isolate power supply;
	3. Clean motor and the interior of the terminal box. Inspect the wiring, components and insulated surfaces for damage, deterioration and overheating: tighten electrical connections as necessary;
	4. Inspect earth bonding arrangements and measure earth bonding continuity resistance. Reading should not be greater than 0.05 Ohms.
	5. Measure insulation resistance. Reading should be greater than 10 Mega Ohms
	6. Restore power supply and check the anti-condensation heater is functioning correctly.
	7. Function test the motor and assess the condition of the bearings
	8. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
3. **Clean and inspect Bilge Pump Motor**
	1. Clean Inspect & Test Bilge Pump Motor;
	2. Inspect earth bonding arrangements and measure earth bonding continuity resistance. Reading should not be greater than 0.05 Ohms;
	3. Measure insulation resistance. Reading should be greater than 10 Mega Ohms:
	4. Restore power supply and check the anti-condensation heater is functioning correctly; and
	5. Function test the motor and assess the condition of the bearings
	6. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
4. **Clean and inspect GS Pump Starter**
	1. Clean Inspect and Test GS Pump Starter;
	2. Inspect earth bonding arrangements and measure earth bonding continuity. Reading should not be greater than 0.05 Ohms;
	3. Test current overload devices; and
	4. Restore power supply and function test the Starter; and
	5. Check remote operation
	6. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
5. **Clean and Inspect Bilge Pump Starter**
	1. Clean Inspect and Test Bilge Pump Starter;
	2. Inspect earth bonding arrangements and measure earth bonding continuity. Reading should not be greater than 0.05 Ohms;
	3. Test current overload devices; and
	4. Restore power supply and function test the Starter; and
	5. Check remote operation
	6. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
6. **Service Emergency Fire-fighting & Salvage Pump's Engine & Pump**
	1. Drain Lube oil charge and dispose.
	2. Drain contents of fuel tank (petrol) and dispose.
	3. Carry out service on the units engine including: -
	4. Change Lube Oil;
	5. Change Lube Oil Filter;
	6. Change / clean Fuel Filter;
	7. Change Air Filter; and
	8. Replace spark plugs
	9. Disassemble and carry out visual inspection of the pump impellor and mechanical seal, re-assemble using new gaskets.
	10. Fill the fuel tank and function test the engine and pump unit working on load for 30 minutes.
7. **Service ‘Mattei’ Service Air Compressor**
	1. Disconnect and isolate electrical supply
	2. Carry out a full 12-month service, to include: -
	3. Replacement of the air filter,
	4. Change the lube oil with Rotoroil 8000 F2 oil
	5. Replace the oil return valves
	6. Replace the separator condensate filter
	7. Check all wiring and terminal connections
	8. Clean the oil radiator and compressor air final cooler
	9. Check automatic system condensate valve in sewage plant room
	10. Re-connect electrical supplies
	11. On completion of re-commissioning function test.
8. **Ultrapac 2000 Air Dryer - Service & Replace Desiccant**
	1. Carry out Annual service to the manufacturer’s recommendations including replacement of desiccant.
	2. Air Dryer Technical details as follows: -
		1. Dryer Type – Ultrapac 200
		2. Serial No – 1150958 / 1
		3. Flow – Max 15m3/h
		4. Year of Man – 2001
		5. Pre-filter element – MF 04/10
		6. Size – 0015
		7. Voltage – 230 V 50-60 Hz
		8. Working Pressure – min 4 bar/max 16 bar
		9. Working Temp – 4 degrees C / Max 50 degrees C
		10. After-filter Element – PE 04/10
	3. Report all findings to the Border Force Overseeing Officer.
	4. Complete Formal Service Report, to include condition report, any defects found and life span of desiccant.
9. **FW Accumulator Internal Insp.& Test to 3.5bar + Tally + Cert.**
	1. Disconnect and drain the hydrophore.
	2. Open the inspection hatch clean as necessary
	3. Present the cleaned tank to the Border Force Overseeing Officer.
	4. Re-seal inspection hatch replacing seal gasket as necessary.
	5. Refill and test to 3.5 bar: tally and provide two copies of the test certification on completion. The BFOO is to be present for this test.
	6. Re-commission to the correct operating pressure and function test.
10. **Overhaul Waste Water Discharge Pump (Air Operated)**
	1. Remove and Inspect Balls and Valve Seats as follows: -
		1. Remove Outlet and Inlet manifolds, balls, valve seats and O rings;
		2. Inspect and measure the balls, valve seats and O rings and replace components outside of the usable ranges (for NDP-50);
		3. Replace PTFE O rings regardless of condition, for O rings (other than PTFE) - replace if worn or cracked; and
		4. Re-assemble in reverse order, the tightening torque for the manifold retainer bolts is 20 Nm.
	2. Remove and Inspect Diaphragm and Centre Rods as follows: -
		1. Remove the balls and valve seats etc.
		2. Remove the diaphragm and centre rod. (BA\_BS\_BF Types);
		3. Inspect diaphragm and centre rod. Replace the diaphragm if worn out or damaged or diaphragm life is exceeded. Replace the centre rod if measured diameter is outside the usable range; and
		4. Re-assemble in reverse order. (B\_C, B\_N, B\_E, B\_V, B\_H, B\_S Types). The tightening torque for the centre rod is 60 N-m and for the out chambers 40 Nm.
	3. Remove and Inspect Throat Bearing and Pilot Valve as follows: -
		1. Remove the diaphragm and centre rod as per .02 (above);
		2. Remove throat bearing and pilot Valve as per section 6.1;
		3. Inspect throat bearing, O ring and pilot valve. Replace the throat bearing if the measured inside diameter is outside the usable range. Replace the O ring if worn out or cracked. Replace pilot valve if worn out or cracked;
		4. Re-assemble in reverse order. The tightening torque for the air chamber retainer bolts is 20 Nm; and
		5. Retighten Tie rods
11. **Overhaul Listed Fans**

|  |  |
| --- | --- |
| 29.1. | Remove the following listed fan motors and transport to a suitable shore-side workshop: - |
|  |  | **Code** | **Fan** | **Location** |
|  | a.) | AC-1: | Air-conditioner |  |
|  | b.) | E-1: | Galley exhaust fan |  |
|  | c.) | E-2: | Toilet area exhaust fan |  |
|  | d.) | E-3: | Circulating air /exhaust fan |  |
|  | e.) | S-1: | Engine room intake fan |  |
|  | f.) | S-2: | Engine room intake fan |  |
|  | g.) | E-4: | Emergency generator room exhaust fan |  |
|  | h.) | E-5: | Engine room air exhaust fan |  |
|  | i.) | E-6: | Rudder propeller room exhaust fan |  |
|  | j.) | E-7: | Bows equipment room exhaust fan |  |
|  | k.) | E-8: | Steering gear engine room air exhaust fan |  |
|  | l.) | E-9: | Engine room exhaust fan |  |
|  | m.) | E-10: | Engine room exhaust fan |  |
|  | n.) |  | Bilge suction fan |  |
|  |  |  |
| 29.2 | Label and protect exposed cables from damage / ingress of moisture. |
| 29.3 | Carry out overhaul of the motors in accordance with the prudent engineering practice / manufacturers recommendations. |
| 29.4 | Whilst any fan is removed from vessel the ductwork is to be de-greased and cleaned for the first 600 mm of each opening created. |
| 29.5. | On completion of the overhaul, reinstall the motors and carry out earth bonding, continuity and insulation tests. |
| 29.6. | On completion of re-installation, function test the fans  |
|  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **EQUIP-MENT CODE** | **List of Equipment** | **Pow’rReq’d kW** | **MOTOR 3x400V, 50Hz or 1x230v** | **Heating POWER 80o/60 oC kW** | **Cooling POWER****6o/12 oC kW** | **Remarks** |
|  | **POWER CURRENT** |
| **Type** | **IEC** | **IP** | **kW** | **A** | **rpm** |
| AC-1 | Air-conditioner | 4.0 | B&H | 112M | 55 | 5.5 | 9.8 | 2,850 | 60 | 28.5 | Freq. converter 1 |
| LJP-1 | Radiator water circulating pump | 0.07  | Kolmeks |  |  | 0.08 | 0.28 | 1,500 |  |  |  |
| K-1 | Humidifier for AC-1 | 16  |  |  |  |  |  |  |  |  | 21 kg/h |
| PP-1  | Pressurising fan |  | B&H | 90S | 55 | 1.5 | 3.3 | 2,820 |  |  | Freq. converter 2 |
| EL-1 | Pre-heater for pressurising circuit | 3.0 |  |  |  |  |  |  |  |  | Electric radiator  |
| HV-1 | Wheelhouse window demister | 0.7 | B&H | 80A | 55 | 0.75 | 1.8 | 2,850 | 1.2 |  | Freq. converter 3 |
| E-1 | Galley exhaust fan | 0.9 | B&H | 80B | 55 | 1.1 | 2.5 | 2,850 |  |  | Freq. converter 4  |
| E-2 | Toilet area exhaust fan | 0.8 | B&H | 80B | 55 | 1.1 | 2.5 | 2,820 |  |  |  |
| E-3 | Circulating air /exhaust fan | 1.2 | B&H | 90S | 55 | 1.5 | 3.3 | 2,820 |  |  | Freq. converter 1 |
| J-1 | Water cooler for AC-1 | 8.2 |  |  |  |  |  |  |  | 28.5 |  |
| J-2 | Water cooler for PK-1 to PK-6 | 8.2 |  |  |  |  |  |  |  | 19.8  |  |
| KVP-1 | Circulating water pump for J-1 & J-2 | 0.4 | Kolmeks |  |  | 0.65 | 1.8 | 2,900 |  |  |  |
| KVP-2 | Circulating water pump for J-1 & J-2  | 1.50 | Kolmeks |  |  | 1.50 | 3.3 | 2,900  |  |  |  |
| PK-1 | Fan convector, wheelhouse | 0.09 | 1x230 |  |  | 0.09 | 0.31 |  |  | 2.99  |  |
| PK-2 | Fan convector, wheelhouse | 0.09 | 1x230 |  |  | 0.09 | 0.31 |  |  | 2.99 |  |
| PK-3 | Fan convector, equipment room | 0.18 | 1x230 |  |  | 0.18 | 0.67 |  |  | 5.15 |  |
| PK-4 | Fan convector, management office | 0.07 | 1x230 |  |  | 0.07 | 0.24 |  |  | 1.57  |  |
| PK-5 | Fan convector, main switch. room | 0.24 | 1x230 |  |  | 0.24 | 0.89 |  |  | 6.38 |  |
| KVP-3 | Circulating. water pump for PK-1 to PK-5 | 1.50 | Kolmeks |  |  | 1.50 | 3.3 | 2,900 |  |  |  |
| IK-1 | Ammunition store air drier | 0.74 | 1x230 |  |  | 0.74 |  |  |  |  |  |
| **ENGINE ROOMS** |  |  |  |  |  |  |  |  |  |  |
| S-1 | Engine room intake fan | 9.3 | ABB | 160MA | 55 | 11 | 20 | 2,930 |  |  | Freq. converter 5 |
| S-2 | Engine room intake fan | 9.3 | ABB | 160MA | 55 | 11 | 20 | 2,930 |  |  | Freq. converter 6 |
| E-4 | Emergency generator room exhaust fan | 0.076 | 1x230 |  |  | 0.076 | 0.33 | 2,394 |  |  |  |
| E-5 | Engine room air exhaust fan | 0.176 | 1x230 |  |  | 0.176 | 0.83 | 2,644 |  |  |  |
| E-6 | Rudder propeller room exhaust fan | 0.75 | ABB | 80B | 55 | 1.1 | 2.6 | 2,820 |  |  |  |
| E-7 | Bows equipment room exhaust fan | 0.18 | 1x230 |  |  | 0.18 | 0.84 | 2,643 |  |  |  |
| E-8 | Steering gear engine room air exhaust fan | 0.3 | 1x230 |  |  | 0.3 | 1.39 | 2,358  |  |  |  |
| E-9 | Engine room exhaust fan | 0.076 | 1x230 |  |  | 0.076 | 0.33 | 2,394  |  |  |  |
| E-10 | Engine room exhaust fan | 0.076 | 1x230 |  |  | 0.076 | 0.33 | 2,394 |  |  |  |

1. **Hot Water Boiler - Annual Service, including replace PRVs as necessary**

*This service must be carried out by an approved Regulatory service engineer.*

* 1. Carry out the annual service to the LAKA ZK 50-160 Oil fired Boiler.
	2. Remove the burner access door and clean the burner / boiler ‘DO NOT USE WATER’
	3. Check thermal insulation of the cleaning door for integrity and sealing.
	4. Remove and check the setting of the safety valve or replace as necessary
	5. Carry out a function test of the boiler to the satisfaction of the Border Force Chief Engineer.
	6. Check both oil burners are within the following limits: -
		1. Soot index of the flue gas is between 0 – 1; and
		2. CO2 percentage is 11 -13.
	7. Issue test certificate of flue gas readings.
	8. Report all findings to the Border Force Overseeing Officer.
1. **Remove, Clean & Overhaul Alpha Laval M6-MFM Plate Cooler**
	1. Remove the Alpha Laval ‘M6-MFM’ Air Conditioning System Plate Cooler / Heat Exchanger.
	2. Thoroughly clean, carry out a full overhaul and rebuild on completion using new gaskets.
	3. On completion of the overhaul, carry out a witnessed pressure test and issue test certificate.
	4. Re-install and function test
2. **Clean AC Compressors (x 2)**
	1. To be carried out by an approved Marine Air conditioning specialist.
	2. Clean AC Compressors (x2) and carry out full function test of the system, ensuring system is operating in design parameters.
	3. Provide a written report of findings and work carried to be submitted in both hard copy and an electronic format Acrobat (.pdf).
3. **Check & Replace AC Drier Filling**
	1. To be carried out by an approved Marine Air conditioning specialist.
	2. Replace the AC Drier Filling.
	3. Check condition of ventilation Fan Drive Vee belts.
	4. Adjust the ventilation fan drive belt tension.
4. **Re-charge AC Expansion tanks (x 3)**
	1. Disconnect and remove 3 Off various size expansion tanks.
	2. Carry out pressure test of the expansion tanks.
	3. Renew the PRV.
	4. Re-install the expansion tanks.
5. **Hydraulic System - Clean Inspect & Test Starters**
	1. Clean Inspect and Test Hydraulic System Pump Starters: -
	2. Isolate power supply;
	3. Open the starter panel and clean the interior using a soft brush and vacuum cleaner;
	4. Inspect the interior for damage, deterioration and overheating of the cables and components. Check electrical connections and tighten as necessary;
	5. Inspect contacts for wear and renew as necessary;
	6. Check internal condition of the trigger control unit;
	7. Inspect earth bonding arrangements and measure earth bonding continuity. Reading should not be greater than 0.05 Ohms;
	8. Test current overload devices; and
	9. Restore power supply and function test the Starter; and
	10. Check remote operation
	11. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
6. **Hydraulic System – Clean, Inspect & Test Pump’s Motors**
	1. Clean Inspect & Test Hydraulic Pump Motors: -
	2. Isolate power supply;
	3. Clean motor and the interior of the terminal box. Inspect the wiring, components and insulated surfaces for damage, deterioration and overheating: tighten electrical connections as necessary;
	4. Inspect earth bonding arrangements and measure earth bonding continuity resistance. Reading should not be greater than 0.05 Ohms.
	5. Measure insulation resistance. Reading should be greater than 10 Mega Ohms
	6. Restore power supply and check the anti-condensation heater is functioning correctly.
	7. Function test the motor and assess the condition of the bearings
	8. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
7. **Hydraulic System – Clean & Inspect Air Cooling Heat Exchanger Radiator**
	1. Disconnect the heat exchanger, blank off both hydraulic oil and cooling water pipes.
	2. Clean and degrease.
	3. Re-install and function test
	4. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
	5. Carry out a pressure test to 5 bar in presence of the BFOO.

1. **Replace Hydraulic System Filters x 3**
	1. Isolate the system, replace filter elements in the three filter housings on the Hydraulic power pack as follows: -
		1. Hydac Air filter BFP7G10w1.x
		2. Hydac Return line filter RFMBN/HC330G10b1.X/-G-BA
		3. Hydac Pressure line filter DFBN/HC160G10B1.X/-B6
	2. Report all Defects found to Border Force Overseeing Officer.
	3. On completion re-commission and carryout, a function test on the system
2. **Check Insulation Readings on Listed Circuits**
	1. Check Insulation readings in accordance with Annex H
	2. Submit formal tabulation of readings taken.
3. **Port & Starboard Generators - Running Hour Maintenance as per SISU Schedule**

40.1 The Contractor is to arrange for a Sisu service engineer to carry out the following service: -

* + 1. Technical Analysis of Motor (TAM) inspection;
		2. Engine adjustments;
		3. Removal, clean, test and replace fuel injectors complete with new seals and washers
		4. Adjust tappets;
		5. Function test alarm for lube pressure
		6. Function test alarm for high water temperature
		7. Inspect fuel oil transfer pump;
		8. Inspect Rocker arms;
		9. Inspect Camshaft;
		10. Visually check turbo-charger; and
		11. Visually inspect sea-water pump impellor.

* 1. Report all defects found with work recommendations to the Border Force Overseeing Officer.
	2. On completion of successful service and test supply a service and test report to the Border Force Overseeing Officer.
1. **Port & Starboard Generators - Check Alternator Insulation Readings**
	1. Test and record the insulation readings of the Port Generator’s Alternator windings.
	2. Submit formal tabulation of readings taken.
2. **Emergency Generator - Running Hour Maintenance SISU Schedule**
	1. The Supplier is to arrange for an Sisu service engineer to carry out the following service: -
	2. Technical Analysis of Motor (TAM) inspection;
	3. Engine adjustments;
	4. Removal, clean, test and replace fuel injectors complete with new seals and washers
	5. Adjust tappets;
	6. Function test alarm for lube pressure
	7. Function test alarm for high water temperature
	8. Inspect fuel oil transfer pump;
	9. Inspect Rocker arms;
	10. Inspect Camshaft;
	11. Visually check turbo-charger; and
	12. Visually inspect sea-water pump impellor.
	13. Report all defects found with work recommendations to the Border Force Overseeing Officer.
	14. On completion of successful service and test supply a service and test report to the Border Force Overseeing Officer.
3. **Emergency Generator - Check Alternator Insulation Reading & Function Test Anti-Condensation Heater**
	1. Test and record the insulation readings of the Emergency Generator’s Alternator windings.
	2. Function check generator anti-condensation heating system is working, record voltage and amperage at the heating elements.
	3. Submit formal tabulation of readings taken.
4. **Inspect & Test Shore Power Supply & Export installation & Cables**
	1. Inspect the physical condition of the Shore Power Supply Connection Box and the Shore Power Supply Cable for damage / serviceability with special attention to the plugs and sockets.
	2. For the Shore Power Supply Connection Installation Box and the Shore Power Supply Cable check and record the following: -
	3. Insulation Reading; and
	4. Earth Lead Continuity Check.
	5. For the Power Export Connection Installation Box and the Power Export Cable check and record the following: -
	6. Insulation Reading; and
	7. Earth Lead Continuity Check.
	8. Check condition, operation and insulation readings of the motor driven shore supply cable stowage reel.
	9. Report details to the Border Force Overseeing Officer.
5. **Check Earth Bonding of Shafts, Rudders & Azimuth Drive**
	1. Inspect the physical condition of the bushes on both propeller shaft earthing arrangement, measure and record in Ohms the earth bonding continuity resistance between each shaft and the Ship’s structure.
	2. Measure and record in Ohms the earth bonding continuity resistance between each rudder stocks and the Ship's structure.
	3. Measure and record in Ohms the earth bonding continuity resistance between the Azimuth Drive Thruster Unit and the Ship's structure.
	4. Report all defects found, to the Border Force Overseeing Officer.
6. **Inspect Main & Emergency Batteries**
	1. Location:
		1. Engine Room 2 x Generator Main Sets
		2. Scania Bow Thruster engine
		3. Wheelhouse Deck Forward of Bridge Port Side Emergency Set
		4. Emergency generator
		5. Non-GMDSS Radios set (2 x 12v 200/220Ah) (located in battery room on starboard side of superstructure)
		6. Emergency/General Bridge Systems set (2 x 12v 200/220Ah) (located in battery room on starboard side of superstructure)
		7. GMDSS set (96 x Panasonic LC-R127R2PG1 7Ah 12v Sealed Lead Acid) (located in battery room on starboard side of superstructure) Messrs Ambex Ltd to check 24 Volt & 12 Volt

* 1. **Maintenance Task**
	2. Clean the Battery Sets and inspect for damage, corrosion and electrolyte leaks.
	3. Clean connectors / terminals and coat with no-oxide grease (petroleum jelly).
	4. Check Battery clamping/securing arrangements.
	5. Carry out a capacity test.
	6. Report the results of the test and all defects found to the Border Force Overseeing Officer.
	7. On completion of all approved work, ensure the Batteries are fully charged and restored to the normal operational state.
	8. Measure and record, as a benchmark, all cell voltages, battery temperatures and float charge currents.
1. **Inspect & Test 24v DC Switchboard**
	1. In accordance with Marine Industry Practice, thoroughly clean, visually inspect, and test the following 24vDC switchboards: -
		1. MCR;
		2. MER;
		3. Tech Room; and
		4. Wheelhouse.
	2. Report all defects found with work recommendations to the Border Force Overseeing Officer.
	3. Submit formal tabulation of insulation readings taken.
2. **Inspect & Test Tyco Fire Detection system**
	1. Inspect and clean the following Fire Detection System Detector Heads: -
		1. 14 x Heat Detectors (both fixed and rate of rise type); and
		2. One (1) Smoke (Light scatter) Detector

* 1. Function Test the following: -
		1. 12 x Call Points;
		2. Eight (8) x Audible Alarm Units; and
		3. Two (2) x Alarm Indicator beacons.

* 1. Inspect the Power Supply Unit (PSU) Batteries and connection: noting expiry date.
	2. Function test the system including secondary power mode.
	3. Update test tally.
	4. Report details to the Border Force Overseeing Officer
1. **Load Test Anchor Windlass**
	1. Carry out a Dynamic Load Test of the anchor windlass using a horizontal load of 23 KN Nominal, 181 KN holding.
	2. On completion of successful test, update test tally.
	3. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
2. **Renew Anchor Windlass Gearbox Oil, Grease & Inspect**
	1. Drain down the oil in the gearbox and refill with Mobile 600 XP68.
	2. Lubricate all grease nipples.
	3. Grease brake rods.
	4. Grease swivel points and threaded rods.
	5. Inspect each brake band condition.
	6. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
3. **Anchor Windlass Overhaul**
	1. Strip down the external component parts of the windlass
	2. Clean and de-grease all components.
	3. 03 Carry out dimensional checks of shafts and bearings etc
	4. 04 Inspect gearwheels and provide report on condition found.
	5. Report all defects found, to the Border Force Overseeing Officer.
	6. Renew the Brake bands.
	7. Re-assemble and re-establish the protective paint coatings, in accordance with the International Paints’ repair specification.
	8. On completion, check chain stowage arrangements and function test the unit (veering and hoisting) in an exercise where the anchor chains are re-stowed.
4. **Clean, Survey and Mark the Anchor Cable**
	1. Remove both anchor cables from the vessel.
	2. Thoroughly clean the entire cables.
	3. Survey the cables (including swivels, joining shackle and anchor shackle) for continued use.
	4. Report all defects found, to the Border Force Overseeing Officer.
	5. Produce a formal survey report.
	6. Repaint (and wire) the cable length marks.
	7. Re-stow the cables in the cable locker.
5. **Load Test After Mooring Capstan**
	1. Carry out a Dynamic Load Test of the Port After Mooring Capstan to indicated capability.
	2. On completion of successful test, update test tally.
	3. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
6. **Aft Deck Mooring Capstan Change Gearbox Oil**
	1. The Aft Mooring Capstan gearbox lubricating oil is to be renewed with Mobile XP220
	2. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
7. **Load Test RHIB Cradle Winch**
	1. Carry out a Dynamic Load Test of the RHIB Cradle Launch & Recovery Winch to 1.60 tonnes.
	2. On completion of successful test, update test tally.
	3. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
8. **Survey and Service RHIB Ramp Doors.**
	1. Survey and service the RHIB Ramp doors ensuring: -
		1. Hinges are well greased, move freely and hinge pins are in good condition;
		2. Hydraulically operated door closure locking mechanism operates freely and is in good condition;
		3. Associated Hydraulic hose are in good condition and less than 5 years old; and
		4. Overall gates structure is in a serviceable and undistorted condition.
	2. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
	3. Provide survey report
9. **Inspect Towing Line Components & Load Test Shackles**
	1. Remove the separately listed Towing Line Components and Going to a Buoy equipment from the Cutter.
	2. Undertake visual inspection of Towing Line Components and Going to a Buoy equipment and load test Towing shackles.
	3. Report all Defects and findings to BFOO
	4. Ensure all components are clearly and durably tallied inclusive of paint marking in accordance with the Cutter’s marking cycle.
	5. Return and re-store Towing Line Components, Towing Shackles and Going to a Buoy equipment onboard Cutter.
	6. Issue relevant legislative survey report,
	7. Upon completion of Towing Shackle load tests, issue certificates of test and pass one photocopy and one original to the Border Force Overseeing Officer.
10. **Service 'Ferri' Towing Hook**
	1. Undertake inspection of towing hook components
	2. Carryout an annual service on the towing hook to manufacturer’s recommendations.
	3. Report all Defects and findings to Border Force Overseeing Officer.
	4. Function test all release functions to the satisfaction of the Border Force Overseeing Officer.
	5. Issue inspection report.
11. **Fwd. Palfinger Crane – Annual Inspection, Service & Load Test**
	1. Annual Inspection, Service & Load Test is to be carried out in accordance with the manufacturer’s recommendations, by a Palfinger accredited agent.
	2. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
	3. On completion load test the crane in accordance with LOLER regulations and manufacturer’s specification.
	4. Issue certificate of service, LOLER Test Certificate and MCA certificate for ship mounted hydraulic cranes.
12. **After Palfinger Crane – Annual Inspection, Service & Load Test**
	1. Annual Inspection, Service & Load Test is to be carried out in accordance with the manufacturer’s recommendations, by a Palfinger accredited agent.
	2. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
	3. On completion load test the crane in accordance with LOLER regulations and manufacturer’s specification.
	4. Issue certificate of service, LOLER Test Certificate and MCA certificate for ship mounted hydraulic cranes.
13. **Test all Listed Lifting Points**
	1. All lifting points are to be tested as appropriate to endorse the SWL as indicated locally.
	2. On completion provide certification and tally lifting points with test data and paint colour marking as appropriate with the Cutter’s test marking scheme.
	3. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
14. **Gangway’s Inspection & Deflection Load Test**
	1. Inspect and Load (deflection) test the following gangways / gangway components: -
	2. 3m SALA gangway @ 1,500 SWL; and
	3. Return Gangways and base plate back to vessel stowage.
	4. On completion of satisfactory load test, update the attached test tally, issue certificate of inspection and survey and pass one photocopy and one original copy to the Border Force Overseeing Officer.
15. **Survey & Certify 'SWL' Boarding Boat (RHIB) Entry Ladder**
	1. Thoroughly examine and certify the structure and fitments of the ‘SWL’ Boarding Boat (RHIB) Entry Ladder.
	2. On completion of successful inspection, provide identity tally and issue certificates of thorough examination.
16. **Survey & Certify Aluminium Divers Ladder**
	1. Thoroughly examine and certify the structure of the ‘Aluminium Divers Ladder.
	2. On completion of successful inspection, provide identity tally and issue certificates of thorough examination.
17. **Survey & Certify 'MARS' Rescue Ladder & Harness**
	1. Thoroughly examine and certify the 'SWL' MARS' Rescue Ladder System including the harness.
	2. On completion of successful inspection, provide identity tally and issue certificates of thorough examination.
18. **Survey & Refurbish Lifebuoys**
	1. Renew integral polypropylene cordage, reflective tape and operator identity lettering on all twelve (12) of the Cutter’s lifebuoys, as appropriate
	2. Lettering on lifebuoys to read: -
		1. HMC PROTECTOR
		2. UK BORDER FORCE
	3. On completion present the lifebuoys to the Border Force Overseeing Officer for acceptance and re-place in their respective stowage’s.
	4. Renew lifelines as appropriate.
19. **Renew Lifebuoy Buoyant Lifelines**
	1. Renew the 26 metre buoyant life lines of each of six (6) Lifebuoys.
20. **Renew MoB Smoke Marker Lines**
	1. Renew the MoB Smoke marker lines (approx. length 3m).
21. **Survey & Certify Perry Rescue Lines on Lifebuoys**
	1. Thoroughly examine condition and continued usability of the Perry Rescue Lines on Lifebuoys.
	2. Report all defect found to the Border Force Overseeing Officer.
22. **Inspect & Test Crewsaver Inflatable Lifejackets**
	1. The 16 x Survitec Crewsaver 275N inflatable lifejackets complete with crotch straps and splash hood and McMurdo Smartfind S20 are to be inspected, serviced and tested.
	2. 02. Report all defects found, with work recommendations, to the BFOOIssue individual certificates of inspection and test.
23. **Inspect, Service & Certify both Port & Starboard Side Life Rafts**
	1. The four (4) RFD 16 Persons SOLAS A Pack Life-rafts are to be removed and dispatched for service.
	2. They are to be serviced at the MCA approved RFD Life-raft agent.
	3. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
	4. On return they are to be re-installed (in the correct sequence) onboard complete with correct mausing of retaining shackles, attachment of painter and HRU.
	5. Present re-installed life-raft to the Border Force Overseeing Officer.
	6. An individual certificate of service, inspection and test is required: it is to be issued for each life raft by the Service Agent.
24. **Service & Certify 4 sets Draeger PA 90+ BA Equip & Eight (8) Spare Air Cylinders**
	1. Carryout annual maintenance and certify 4 sets of Draeger PA 90+ Compressed Air Breathing Apparatus and their respective air cylinders.
	2. Carry out the annual maintenance and certify eight (8) spare 9 litre steel BA air cylinders.
	3. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
	4. Issue Certification.
25. **Service & Certify 5 sets Draeger CF10 EEBD**
26. Carryout annual maintenance and certify five (5) sets of Draeger CF10 EEBDs and their respective air cylinders.
27. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
28. Issue Certification.
29. **BAUR Diving Air Compressor Annual Service and Certification**
	1. The BAUR Diving Air Compressor is to be inspected and serviced in accordance with manufacturer’s ‘Annual’ recommendations, summarised as follows: -
	2. Change Intake Filter Cartridge
	3. Check condition of V belt and replace if necessary
	4. Check blow-off pressure of final pressure safety valve
	5. Perform breathing air quality check with Drager Aerotest Simultan test unit or equiv.
	6. Check and clean filter element of intermediate separator
	7. Valve check; and
	8. Oil change mineral oils
	9. Report all Defects found to Border Force Overseeing Officer.
	10. On completion carryout an ‘Air Purity Test’ issue a service report, a certificate of inspection and service and an Air Purity Test certificate and pass one photocopy and one original copy of each to the Border Force Overseeing Officer.
30. **Service Portable Extinguishers**
	1. The following portable hand-held fire extinguishers are to be serviced and certified in accordance with extant regulations: -
		1. 7 x 5Kg CO2;
		2. 1 x 2Kg CO2
		3. 1 x 10 litre AFFF; in E/R
		4. 20 x 6Kg Dry Powder;
		5. 1 x 6Kg Dry Powder (Boarding Boat RHIB);
		6. 2 x 12Kg Dry Powder; Funnel
		7. 1 x 9 litre Water;
		8. 1 Off 9 litre water (training);
		9. 1 Off 9 litre AFFF (training).
	2. Inspect & certify six (6) x Fire blankets
	3. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
	4. Issue Certification.
31. **Examine, Test & Certify Hoses, Nozzles, etc.,**
	1. The following fire hoses and nozzles are to be examined tested and certified.
		1. 15m  / 38mm hose
		2. Mess Deck Aft c/w Fog Fighter
		3. Wet Room Stbd c/w Jet/Spray
		4. Aft Deck Stbd c/w Jet/Spray
		5. Engine Room Stbd Fwd c/w Fog Fighter
		6. Engine Room Stbd Aft c/w Fog Fighter
		7. Engine Room Port Aft c/w Fog Fighter
		8. Scania Compartment c/w Fog Fighter
		9. Hold Stbd c/w Fog Fighter
		10. Deck Store
	2. 15m / 52mm hose
		1. Wheelhouse Aft c/w Jet/Spray
		2. Foredeck Stbd c/w Jet/Spray
		3. Foredeck Port c/w Jet/Spray
		4. Aft Deck Port c/w Jet/Spray
		5. Outside Hold c/w Jet/Spray
		6. Lower Accom c/w Fog Fighter
		7. Deck Store
		8. Deck Store
	3. 15m / 51mm
		1. Office c/w Fog fighter
	4. 20m / 52mm
		1. Deck Store
	5. 30m / 25mm Rigid Reel Hose
		1. Mess Deck Aft
		2. MCR
		3. Deck Store
	6. 3m x 52mm Hose
		1. Foam Inductor and Branch c/w Pick up
		2. 2 x Drums AFFF 3%
		3. Engine Room Oil Store
	7. 3m x 52mm Hose
		1. Foam Inductor and Branch c/w Pick up
		2. 2 x Drums AFFF 3%
32. On completion of survey, pressure test the hoses to 5.25 bar.
33. The six (6) UniJet V12 1.5” Spray Jet fire hose nozzles and their associated instantaneous couplings are to be examined tested and certified.
34. Report all defects found, to the Border Force Overseeing Officer.
35. Issue survey & certification documentation.
36. **Survey & Service EPIRB**
	1. Remove the EPIRB from the vessel and dispatch to the approved Jotron service agent.
	2. In accordance with the guidelines in MSC/Circ.1040 (attached), carryout annual testing of the 406Mhz satellite EPIRB as required by SOLAS regulation IV/15.9 from 01-July-2002.
		1. Note: The battery has a 4-year life, if it requires replacement this will be managed under the Border Force Emergent Work Procedure.
	3. Inspect EPIRB Hydrostatic release expiry date and if less than 1 year remains and renew EPIRB hydrostatic release unit and plastic retaining bolt.
	4. Issue a report with a list of the test results and maintenance performed and pass one photocopy and one original copy to the Border Force Overseeing Officer.
37. **Survey & Certify MoB Boat**
	1. The Zodiac 4.2 metre MoB Boat is to be removed and sent for service, survey & certification.
	2. Annual service carried out on the hull structure, tubes, and all regulatory equipment.
		1. Note: the fire extinguisher is examined and certified within task 570.07.006 ‘Service Portable Fire Extinguishers’.
	3. Survey & certify the associated four-legged webbing lifting sling.
	4. Survey & certify the four lifting points within the MoB Boat.
	5. Issue service report to the Border Force Overseeing Officer.
	6. Issue certification.
38. **Service MoB Boat 25hp Outboard Engine**
	1. The Yamaha 25 hp L/S (Long shaft) outboard engine is to be removed from the MoB Boat and sent for service.
	2. Annual service to be carried out by an approved Yamaha service agent.
	3. On return the outboard is to be re-installed on the MoB Boat.
	4. A service report is to be provided to the Border Force Overseeing Officer.
39. **Inspect and Test Immersion Suits**
	1. Remove the twenty (20) Immersion Suits from the vessel for and service, inspection, and test by an approved agent.
	2. Report all immersion suits failing inspection to the Border Force Overseeing Officer with recommendations for replacement or repair.
	3. On completion return the immersion suits to the vessel crew.
	4. On completion of successful test issue certificates of test.
40. **Survey & Certify Safety Harnesses**
	1. Survey & Certify the following items: -
		1. 2 Off Crewsaver Safety Line & self-Locking hooks
		2. 2 Off Crewsaver Body Harnesses Serial numbers 10290, 10291
	2. Report all defects found to the Border Force Overseeing Officer.
	3. On completion of issue certificates of survey.
41. **Survey & Certify Rescue Sling**
	1. Survey & Certify the ‘Helicopter Strop’ in use as a rescue sling
	2. Report all defects found to the Border Force Overseeing Officer.
	3. On completion of issue certificates of survey.
42. **Survey & Certify Mast Access Equipment**
	1. Maintenance Task
		1. Note: These tasks are to be carried out

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Shepley Lane,

Marple,

Stockport

SK6 7JW

TEL 0161 449 5615.

* 1. Survey & Certify the following items of Mast Access Equipment: -
		1. 2 Off Body Harnesses;
		2. 2 Off Lanyards; and
		3. 2 Off Climbing Helmets.

* 1. Report all defects found to the Border Force Overseeing Officer.
	2. On completion of issue certificates of survey.
1. **Survey & Certify Mast, Funnel & Bridge Roof Attachment Rails and Ladders**
	1. Maintenance Task
		1. Note: These tasks are to be carried out by an approved Service Agent specific to the Equipment.

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* 1. Survey & Certify the Mast, Funnel & Bridge Roof Safety Equipment Attachment Rails including the following: -
	2. The Mounting brackets for the three attachment rails are in good condition and correctly installed;
	3. All bolt connections are correctly torqued to 40 Nm
	4. The Rail End Stops (2 per rail) are present, in good condition and securely installed.
	5. The central slots of the attachment rails clear of obstructions, dirt or corrosion.
	6. The three ladders (Mast x2 and Funnel x 1) are in good condition securely installed.
	7. Test climbing has taken place with no defects found
	8. Only anti-corrosive, or stainless-steel mounting elements and bolt connections have been used; and
	9. The ‘Traveller(s)’ on each rail moves freely
	10. Report all defects found to the Border Force Overseeing Officer.
1. **Survey & Certify Bosun’s Chair**
	1. Survey & Certify the Bosun’s Chair
	2. Report all defects found to the Border Force Overseeing Officer.
	3. On completion of issue certificates of survey.
2. **Inspect and Certify Pneumatic Line Throwing Equipment Air Cylinder (x2)**
	1. Remove both (x2) PLT launchers to an approved test house.
	2. Disconnect, Inspect, Pressure Test and Certify the Cylinders.
	3. Re-charge and re-connect the cylinders.
	4. Return PLT launcher to the vessel.
	5. Supply 2 copies of the certificates.
3. **Service, Survey & Certify CO2 System**
	1. Service, Survey and Certify the fixed CO2 Extinguishing System for engine room, emergency generator compartment and AzD (Bowthruster) room as follows: -
	2. Disconnect 5 off main CO2 cylinders from the system and insert blanks;
	3. Visually inspection the whole CO2 system;
	4. Blow through discharge pipe work system with clean air at a minimum pressure of at least 20 bar;
	5. Check the contents and levels of the 5 off main 45kg CO2 cylinders and the 3 off pilot cylinders;
	6. Check all flexible hoses for ageing;
	7. Check pilot bottle pressures are greater than 120 Bar and within 10% of one another;
	8. Function check of the pull handle to activate the cylinder valves, close valves and check for leakage;
	9. Fill CO2 manifold with 25 bar from an air test cylinder (Main valves closed or sections sealed);
	10. Close and disconnect the CO2 test cylinder, check thread connections for leakage;
	11. Check operation of pressure gauge; and
	12. Blow through the CO2 pipe work with the CO2 gas in the manifold or clean air with a pressure of a minimum 20 bar.
	13. Report all defects found with work recommendations to the Border Force Overseeing Officer.
	14. On completion, re-connect / re-commission the system.
	15. Present the re-commissioned system to the Border Force Overseeing Officer.
	16. On completion of successful survey, update test tally, issue certificate.
4. **Service, Survey & Certify CO2 System**
	1. Service, Survey and Certify the Magazine’s fixed Water Fog - Fire Suppression System as follows: -
	2. Remove 3 x Fog heads and transport to a shoreside facility to clean and individually functionally test with fresh water (at 4 bar) that the fog-heads (nozzles) operate correctly;
	3. Remove, visually inspect and test the correct operation of the discharge / isolating valve located in the Bosun’s locker. whole CO2 system;
	4. Visually inspect and blow through discharge pipe work system with clean air at a minimum pressure of at least 20 bar; and
	5. Reinstall discharge / isolating valve and fog heads (x3) with new gaskets / washers ensuring all components are securely tightened to effectively re-connect / re-commission the system.
		1. Note: During the process of this maintenance task, to avoid dry salt residues casing corrosion in the pipework or blocking degrading fog head performance it is not intended that the pipework system is subjected to flow from the saltwater fire-main.
	6. Report all defects found with work recommendations to the Border Force Overseeing Officer.
	7. Present the re-commissioned system to the Border Force Overseeing Officer.
	8. On completion of successful survey, update test tally, issue certificate.
5. **Sauna - Clean, Service & Check Electrical Insulation**
	* 1. Note: Task to be carried out by a company specialising in maintenance of

Sauna installations.

* 1. Thoroughly inspect fitments (excluding the sauna stove) internal lining, seating, door and door seal for damage and degradation.
	2. Submit a report of all defects found, to the Border Force Overseeing Officer.
	3. After completion of all repair work (treated as Emergent work) carryout deep cleaning and disinfection of all sauna timber surfaces.
	4. Check Sauna Stove electrical connections and insulation.
	5. Report all defects found, to the Border Force Overseeing Officer.
	6. Provide a service report.
1. **Inspect & Carryout Compass Swing**
	1. Inspect the Compass Binnacle mounted on the forward Wheelhouse top.
	2. Carry out a compass swing on the binnacle mounted Lilley & Gillie SR-4 magnetic compasses on the Bridge roof.
		1. Note: The compass swing is to be carried as early as possible after the completion of the annual maintenance period: at the convenience of the vessels commander, when the vessel is fully operational with all equipment embarked.
	3. On completion of the compass swing issue a deviation card for the compass to the onboard crew and pass copies to the Border Force Overseeing Officer.
2. **Annual Service Oxygen Therapy Set**
	1. The Oxygen Therapy Set is to be sent for its annual service complete with both oxygen bottles
	2. Inclusive within the service is to be the inspection, pressure testing and certification of the oxygen bottles (cylinders).
	3. Note: This is to include hydraulic pressure testing of the cylinders every five (5) years.
	4. Re-charge the oxygen bottles (cylinders).
	5. Return Oxygen Therapy Set with both bottles (cylinders).
	6. Supply 2 sets of certificates.
3. **Additional Inspect, Service & Certify 2 x Zodiac Life Rafts**
	1. The two (2) Zodiac 16 Persons SOLAS B Pack Life-rafts are to be removed and dispatched for service.
	2. They are to be serviced at the MCA approved Zodiac Life-raft agent.
	3. An individual certificate of service, inspection and test is required: it is to be issued for each life raft by the Service Agent.
	4. Report all defects found, with work recommendations, to the Border Force Overseeing Officer.
4. **Overhaul Raised Coaming Watertight Hatches**
	1. **Overhaul Listed Hatches as follows: -**
		1. **Weather deck Forward**: **Fore Peak Access**; Inside of the raised section needs to be stripped and repainted.
		2. **Port & Stbd Chain Locker Vertically positioned Access Hatches**; Both internal surfaces need to be cleaned and repainted.
		3. **Weather deck Forwar**d**: Mission Hold Access / Escape**; Inside of the raised section needs to be cleaned and painted. Replace Pop Rivits missing from the inside cover for the hatch.
		4. **Weather deck Forward**: **Mission Hold Cargo Hatch**; New seal needed for both doors & the middle section. External centre section needs to be stripped and painted due to corrosion patches all over. All hinge pins need to be checked. Dog clips need to be checked for alignment and size to aid in securing it down properly. Cleats around the raised section need to be replaced due to being badly corroded. Both fwd locking bars (internal) need to be checked for alignment etc as the locking collars do not lock down fully without force.
		5. **Weather deck Aft: MER Access / Escape;** Seal needs to be checked and possibly packed out in a couple of sections. Hinges need to be cleaned and painted.
		6. **Weather deck Aft: Port After Cargo Hatch**; Seal needs to be packed out in places, needs cleaned and painted. Alignment of dog and clamp needs checked.
		7. **Weather deck Aft: Access / Escape hatch inset in Port After Cargo Hatch**; Dogs need removed and cleaned.
		8. **Weather deck Aft: Starboard After Cargo Hatch**; Seal needs packing in a couple of places, dogs need cleaned and alignment checked, 1 (aft outboard) dog handle needs inspected as found damaged, possible replacement required.
		9. **Weather deck Aft: Access / Escape hatch inset in Starboard After Cargo Hatch**; Dogs need to be removed and cleaned.
		10. **Weather deck Aft: Port Steering Compartment Access / Escape**; Raised section will need to be shot blasted back (especially outboard side (restricted space to try and get hands in) and repainted.
		11. **Weather deck Aft: Starboard Steering Compartment Access / Escape;** Raised section will need to be shot blasted back (especially outboard side (restricted space to try and get hands in) and repainted.
		12. **Mission Hold Port: Sewage Plant Space Access / Escape**. Seal needs packing in 1 section.
	2. Check all clips for correct operation. Remove and dismantle seized clips, make good defects and lubricate with Castrol Spheerol EPL 2. All dogs need to be removed and cleaned up, greased and refitted.
	3. Remove hinge pins and inspect for wear; renew if necessary. All need to be checked properly.
	4. Lubricate all moving parts and charge grease nipples with Castrol Spheerol EPL2.
	5. Replace seals on forward Mission hold hatch.
	6. All hatches need to have the sealing faces cleaned and squared off properly and then painted.