

Rpt. 4b

Date of writing report 15-11-56

Received London 22 NOV 1956

Port BELFAST

No. 16213

Survey held at BELFAST

No. of visits In shops } 745 On vessel }

First date 8 MARCH 1956

Last date 24 OCTOBER 1956

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 90331 Name "ONDO" Gross tons 5434.84

Owners ELDER Dempeter Lines Ltd Managers Port of Registry LIVERPOOL Year Month

Hull built at BELFAST By HARLAND & WOLFF LTD Yard No. 1554 When 1956

Main Engines made at BELFAST By HARLAND & WOLFF LTD Eng. No. 1554 When 1956

Gearing made at By

Donkey boilers made at ANNAM By COCHRAN & CO ANNAM LTD Blr. Nos. 20841 When 1956

Machinery installed at BELFAST By HARLAND & WOLFF LTD When 1956

Particulars of restricted service of ship, if limited for classification

Particulars of vegetable or similar cargo oil notation, if required CARRYING VEGETABLE OIL IN DEEP TANKS

Is ship to be classed for navigation in ice? No Is ship intended to carry petroleum in bulk? No

Is refrigerating machinery fitted? YES If so, is it for cargo purposes? YES Type of refrigerant DICHLORODIFLUOROMETHANE

Is the refrigerating machinery compartment isolated from the propelling machinery space? No Is the refrigerated cargo installation intended to be classed? No

The following particulars should be given as fully and as clearly as possible. Where the answer is "No" or "None", say so! Ticks and other signs of doubtful meaning are not to be used. Where the wording is not applicable to the installation, a black line may be inserted. If the main engines have been constructed at another port and are covered by a separate report, the particulars given in that report need not be repeated below, but the port and report number should be stated.

No. of main engines ONE No. of propellers ONE Brief description of propulsion system 5 CYL TWO CYCLE SINGLE ACTING ECCENTRIC TYPE OPPOSED PISTON BURNING HEAVY OIL

MAIN RECIPROCATING ENGINES. Licence Name and Type No. H & W TWO CYCLE SINGLE ACTING OPPOSED PISTON

No. of cylinders per engine 5 Dia. of cylinders 620 mm stroke(s) 1400 mm + 470 mm 2 or 4 stroke cycle 2 cycle Single or double acting SINGLE

Maximum approved BHP per engine METRIC 3750 MAX at 115 RPM of engine and 115 RPM of propeller.

Corresponding MIP 92 lbs (For DA engines give MIP top & bottom) Maximum cylinder pressure 700 lbs Machinery numeral 750

Are the cylinders arranged in Vee or other special formation? No If so, number of crankshafts per engine

TWO STROKE ENGINES. Is the engine of opposed piston type? YES If so, how are upper pistons connected to crankshaft? 4 SIDE RODS 2 CROSSHEADS & ECCENTRICS ON WEBS

Is the exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? PORTS No. and type of mechanically driven scavenge pumps or blowers per engine and how driven 2 BLOWERS DRIVEN FROM CRANKSHAFT THROUGH CHAIN WHEELS & CHAINS

No. of exhaust gas driven scavenge blowers per engine NONE Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action?

If a stand-by or emergency pump or blower is fitted, state how driven NONE ENGINE CAN OPERATE ON ONE BLOWER No. of scavenge air coolers NONE Scavenge air pressure at full power 1.4 lbs

Are scavenge manifold explosion relief valves fitted? YES

Is the engine supercharged? Are the undersides of the pistons arranged as supercharge pumps? No. of exhaust gas driven blowers per engine

No. of supercharge air coolers per engine Supercharge air pressure Can engine operate without supercharger?

TWO & STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel 2 Inlet NONE Exhaust NONE Starting ONE Safety ONE

Material of cylinder covers COVERLESS ENG Material of piston crowns CAST STEEL Is the engine equipped to operate on heavy fuel oil? YES

Cooling medium for: Cylinders WATER Pistons OIL Fuel valves WATER Overall diameter of piston rod for double acting engines

Is the rod fitted with a sleeve? No Is welded construction employed for: Bedplate? YES Frames? YES Entablature? YES Is the crankcase separated from the underside of pistons? YES

Is the engine of crosshead or trunk piston type? CROSSHEAD Total internal volume of crankcase 3435 CU FT. No. and total area of explosion relief devices 1694 sq IN

Are flame guards or traps fitted to relief devices? YES Is the crankcase readily accessible? YES If not, must the engine be removed for overhaul of bearings, etc? NO

Is the engine secured directly to the tank top or to a built-up seating? DIRECT TANK TOP How is the engine started? COMPRESSED AIR

Can the engine be directly reversed? YES If not, how is reversing obtained?

Has the engine been tested working in the shop? YES How long at full power? 8 HR.

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system SECYS LETTER 14-1-58 State barred speed range(s), if imposed

for working propeller NONE For spare propeller NONE Is a governor fitted? YES Is a torsional vibration damper or detuner fitted to the shafting? NO

Where positioned? Type No. of main bearings 7 Are main bearings of ball or roller type? No

Distance between inner edges of bearings in way of crank(s) 1178 mm Distance between centre lines of side cranks or eccentrics of opposed piston engines 970 mm

Crankshaft type: Built, semi-built, solid. (State which) BUILT

Diameter of journals 475 mm Diameter of crankpins Centre 560 mm Eccentric side 1040 mm Breadth of webs at mid-throw 1020 mm Axial thickness of webs 250 mm

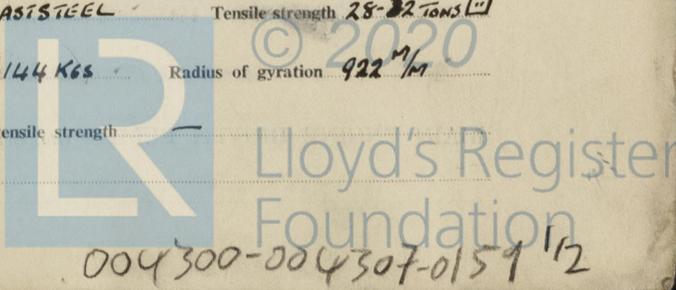
If shrunk, radial thickness around eyeholes 267.5 mm Are dowel pins fitted? NO Crankshaft material Journals SM STEEL PINS SM STEEL Minimum 28-32 TONS

Approved 28-32 TONS Webs CAST STEEL Tensile strength 28-32 TONS

Diameter of flywheel 2774 mm Weight 1100 Kgs Are balance weights fitted? YES Total weight 6144 Kgs Radius of gyration 922 mm

Diameter of flywheel shaft NONE Material Minimum approved tensile strength

Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) NONE



004300-004307-0159 12

**MAIN GAS TURBINES.** Name and Type No.

No. of sets of turbines \_\_\_\_\_ Open or closed cycle \_\_\_\_\_ BHP per set \_\_\_\_\_ at \_\_\_\_\_ RPM of output shaft \_\_\_\_\_

How is drive transmitted to propeller shaft? \_\_\_\_\_

ARRANGEMENT OF TURBINES. HP drives \_\_\_\_\_ at \_\_\_\_\_ RPM HP gas inlet temperature \_\_\_\_\_ pressure \_\_\_\_\_

IP drives \_\_\_\_\_ at \_\_\_\_\_ RPM IP gas inlet temperature \_\_\_\_\_ pressure \_\_\_\_\_

LP drives \_\_\_\_\_ at \_\_\_\_\_ RPM LP gas inlet temperature \_\_\_\_\_ pressure \_\_\_\_\_

No. of air compressors per set \_\_\_\_\_ Centrifugal or axial flow type? \_\_\_\_\_ Material of turbine blades \_\_\_\_\_ Material of compressor blades \_\_\_\_\_

No. of air coolers per set \_\_\_\_\_ No. of heat exchangers per set \_\_\_\_\_ How are turbines started? \_\_\_\_\_

How is reversing effected? \_\_\_\_\_ Are the turbines operated in conjunction with free piston gas generators? \_\_\_\_\_

Total No. of free piston gas generators \_\_\_\_\_ Diameter of working pistons \_\_\_\_\_ Diameter of compressor pistons \_\_\_\_\_ No. of double strokes per minute at full power \_\_\_\_\_ Gas delivery pressure \_\_\_\_\_ Gas delivery temperature \_\_\_\_\_ Have the turbines and attached equipment been tested working in the shop? \_\_\_\_\_ How long at full power? \_\_\_\_\_

**ELECTRIC PROPULSION.** (Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.)

No. of generators \_\_\_\_\_ KW per generator \_\_\_\_\_ at \_\_\_\_\_ RPM AC or DC? \_\_\_\_\_ Position \_\_\_\_\_

No. of propulsion motors \_\_\_\_\_ SHP per motor \_\_\_\_\_ at \_\_\_\_\_ RPM Position \_\_\_\_\_

How is power obtained for excitation of generators? \_\_\_\_\_ Motors? \_\_\_\_\_

**REDUCTION GEARING.** (Reciprocating engines or gas turbines. A small line sketch should be attached showing arrangement of gearing.)

Is gearing of single or double helical type? \_\_\_\_\_ If single, position of gear thrust bearing \_\_\_\_\_ Is gearing of epicyclic type? \_\_\_\_\_

PCD of pinions: First reduction \_\_\_\_\_ Second reduction \_\_\_\_\_ PCD of wheels: First reduction \_\_\_\_\_ Main \_\_\_\_\_

Material of pinions \_\_\_\_\_ Tensile strength \_\_\_\_\_ Material of wheel rims \_\_\_\_\_ Tensile strength \_\_\_\_\_

Are gear teeth surface hardened? \_\_\_\_\_ How are teeth finished? \_\_\_\_\_ Diameter of pinion journals \_\_\_\_\_ Wheel shaft journals \_\_\_\_\_

Are the wheels of welded construction? \_\_\_\_\_ Is gearcase of welded construction? \_\_\_\_\_ Has the wheel/gearcase been heat treated on completion of welding? \_\_\_\_\_ Where is the propeller thrust bearing located? \_\_\_\_\_ Are gear bearings of ball or roller type? \_\_\_\_\_

**CLUTCHES, FLEXIBLE COUPLINGS, ETC.** If a clutch or other flexible connection is fitted between engine/turbine and gearing or between engine and line shafting give brief description and, for clutches, state how operated \_\_\_\_\_

Can the main engine be used for purposes other than propulsion when declutched? \_\_\_\_\_ If so, what? \_\_\_\_\_

STRAIGHT SHAFTING. Diameter of thrustshaft  $455 \frac{M}{M}$  Material **S.M. STEEL** Minimum approved tensile strength **28-32 TONS**

Shaft separate or integral with crank or wheel shaft? **SEPARATE** Diameter of intermediate shaft  $13 \frac{5}{8}$  Material **S.M. STEEL**

Minimum approved tensile strength **28-32 TONS** Diameter of screwshaft cone at large end  $15 \frac{1}{4}$  Is screwshaft fitted with a continuous liner? **YES**

Diameter of tube shaft (If these are separate shafts) \_\_\_\_\_ Is tube shaft fitted with a continuous liner in nose of stern tube \_\_\_\_\_ Thickness of screwshaft liner at bearings  $13 \frac{1}{16}$  Thickness between bearings  $5 \frac{1}{8}$  Material of screwshaft **S.M. STEEL** Minimum approved tensile strength **28-32 TONS**

Is an approved oil gland fitted? **NO** If so, state type \_\_\_\_\_ Length of bearing next to and supporting propeller **5'-2"**

Material of bearing **LIQUIDITAE** In multiple screw vessels is the liner between stern tube and A bracket continuous? \_\_\_\_\_ If not, is the exposed length of shafting between liners readily visible in dry dock? \_\_\_\_\_

PROPELLER. Diameter of propeller  $16'$  Pitch  $11.75 \times 115 \times 60$  Built up or solid **SOLID** Total developed surface **96 sq ft**

No. of blades **4** Blade thickness at top of root fillet  $6 \frac{15}{16}$  Blade material **MANGANESE BRONZE** Moment of inertia of dry propeller **7500 Kg M<sup>2</sup>**

If propeller is of special design, state type **"HELIXTON"** Is propeller of reversible pitch type? **NO** If so, is it of approved design? \_\_\_\_\_

State method of control \_\_\_\_\_ Material of spare propeller **CAST IRON** Moment of inertia **8400 Kg M<sup>2</sup>**

**AIR COMPRESSORS & RECEIVERS.** No. of main engine driven compressors per engine **NONE** Can they be declutched? \_\_\_\_\_

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) **2 @ 120 CUFT/MIN. ELECTRIC MOTOR. P.F.O.M.**

**GLASGOW No C30087 & C30089. ONE 264 CUFT/MIN. HAND START DIESEL. P.F. SOUTHAMPTON No D8764.**

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) **MAIN 2 @ 400 CUFT P.F.A.A. BEL No X1053.**

**BEN ENGINE 2 @ CUFT No T343620. L.P. AIR SERVICES ONE 50 CUFT P.F. BEL No X1051. AIR SUPPLY TO EMERGENCY STEERING ENGINE. ONE 50 CUFT STEERING GEAR ROOM BEL No X1052. NOTE GEN AIR RECEIVER PLEASE SEE LONDON REP No 13355**

How are receivers first charged? **HAND START DIESEL DRIVEN AIR COMPRESSOR** Maximum working pressure of starting air system **356 lbs** Are the safety devices in accordance with the Rules? **YES** Has the starting of the main engines been tested and found satisfactory? **YES**

**COOLERS.** No. of main engine fresh water coolers **ONE** No. of main engine lubricating oil coolers **TWO**

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure **ONE COMBINED PURIFIED & UNPURIFIED HEAVY OIL TANK AFT.**

**MAIN ENGINE DRIVEN PUMPS** (No. and Purpose) **NONE**

No	Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	Service for which each pump is connected to be marked thus X															
		SUCTION							DELIVERY								
		Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	HEAT EXCH
	<b>ELECTRIC MOTOR = E.M.</b>																
1	<b>MAIN S.W. CIRC<sup>o</sup> STB CENT. E.M.</b>						X				X	X			X		X
1	<b>AUX " " STB AFT E.M. CAPACITY 210T/H.</b>						X				X	X			X		X
1	<b>BALLOON STAND BY CIRC<sup>o</sup> STB CENT E.M. CAPACITY 110T/H.</b>	X	X	X			X				X	X		X			
1	<b>FIRE &amp; BILGE PORT FORD E.M.</b>	X	X	X			X							X			
1	<b>SANITARY STB FORD E.M.</b>						X							X			
2	<b>MAIN F.W. CIRC<sup>o</sup> STB E.M.</b>					X						X					
2	<b>FUEL VALVE COOLING FORD E.M.</b>																
2	<b>LUBRICATING OIL STB AFT E.M.</b>								X						X	X	
2	<b>FUEL OIL SERVICE STB AFT E.M.</b>				X												
1	<b>FUEL OIL TRANSFER PORT AFT E.M.</b>				X								X				
1	<b>FUEL OIL STAND BY PORT AFT STEAM</b>				X								X				
1	<b>DIESEL OIL TRANSFER PORT AFT E.M.</b>				X								X				
2	<b>BOILER FEED STB STEAM</b>						X	X									
1	<b>PALM OIL PORT FORD STEAM</b>																

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room. **No 1 - 3 1/2" P&S. No 2 - 3 1/2" P&S. No 3 - 3 1/2" P. OUTER, P. INNER, 8 INCH. BOUTER.**

**No 4 - 3 1/2" P&S. No 5 - 3 1/2" P&S + 2 1/2" TUNNEL DR DRAIN HAT**

No. and size connected to main bilge line in main engine room **4 @ 3" - 1 @ 2 1/2" D.B. SAVE ALL.**

In aux. engine room \_\_\_\_\_ Size and position of direct bilge suction in machinery spaces **1 @ 3" STARBOARD**

Size and position of emergency bilge suction in machinery spaces **1 @ 10" STARBOARD**

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? **YES** Do the piping arrangements comply with the Rules including special requirements for ships carrying petroleum in bulk, cargo oil ~~or~~ (strike out words not applicable). **YES.**

**STEAM & OIL ENGINE AUXILIARIES**

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
<b>PORT FORWARD</b>	<b>3.12 6CYL VERTICAL</b>	<b>W.H. ALLEN &amp; CO LTD</b>	<b>LONDON No 138385</b>	
<b>PORT AFT</b>	<b>AIRLESS INJECTION</b>	<b>BEDFORD</b>	" "	
<b>STARBOARD FORWARD</b>	<b>NORMALLY ASPIRATED</b>	" "	" "	
<b>STARBOARD AFT</b>	" "	" "	" "	
<b>PORT FORWARD</b>	<b>3 1/2 UP SINGLE CYLINDER LISTER DIESEL ENGINE</b>	<b>LISTER</b>	<b>SOUTHAMPTON D 8764</b>	<b>EMERGENCY AIR COMPRESSOR</b>

Is electric current used for essential services at sea? **YES** If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea. **TWO @ 125 KW**

Is an electric generator driven by Main Engine? **NO**

STEAM INSTALLATION. No. of donkey boilers burning oil fuel **ONE** W.P. **120 lbs** Type **COLSON COMPOSIT OILFIRED & ROBUST GAS**

Position **LOWER PLATFORM ENGINE ROOM FORWARD**

Is a superheater fitted? **NO** Are these boilers also heated by exhaust gas? **YES** No. of donkey boilers heated by exhaust gas only? **NONE** W.P. \_\_\_\_\_

Type \_\_\_\_\_ Position \_\_\_\_\_ Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil fired boilers? \_\_\_\_\_ Port and No. of report on donkey boilers **GLASGOW No 85664**

Is steam essential for operation of the ship at sea? **NO** Are any steam pipes over 3 ins. bore? **YES** If so, what is their material? **S.D. STEEL** For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? **YES** No. of oil burning pressure units **ONE** No. of steam condensers **NONE** No. of Evaporators **ONE**

**STEERING GEAR.** (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) **ONE 36HP ELECTRIC MOTOR ONE 3CYL AIR ENGINE**

**TWO L.P. 18. HELE SHAW PUMPS. 4.10" CAST IRON CYLINDERS & RAMS.**

Have the Rule Requirements for fire extinguishing arrangements been complied with? **YES** Brief description of arrangements **2 @ 30 BALL PORTING SIDE AFT 12 @ 20 BALL PORTING FIRE EXT. 2 @ 10 CUFT SAND BINS. STEAM SMOTHERING AROUND D.B. PYRENG INERT GAS FIRE AUTOMATICALLY SYSTEM (PLUMBED 300 300W LATER 18. 8. 56)**

Has the spare gear required by the Rules been supplied? **YES** Has all the machinery been tried under full working conditions and found satisfactory? **YES** Date and duration of full-power sea trials of main engines **23 & 24. 10. 56 30 HOURS.** Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) **NO**

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (strike out words not applicable). For **HARLAND AND WOLFF LIMITED**

GENERAL REMARKS

State if the machinery has been constructed and/or installed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship and give recommendations for classification, including any special notation to be assigned. Where existing machinery is submitted for classification the circumstances should be explained as fully as possible.

The machinery has been constructed & installed under special survey in accordance with the Rules, approved plans & Secretary's letters. The materials and workmanship are good. On completion the machinery was examined under full working conditions with satisfactory results, explosion doors fitted to crankcase and scavenge belt. The machinery of this vessel is eligible in our opinion to be classed in the Register Book with the record **⊕ LMC 10-56 TS. CL. D.B. 120lbs**

*A. Fairclough* J.M.D.M.

Engineer Surveyor to Lloyd's Register of Shipping.

PARTICULARS OF IDENTIFICATION MARKS (Including Port of origin) of important Forgings and Castings. (Copies of certificates should be forwarded with report.)

RODS (Piston) SHEFFIELD. S. 4905, S. 4979/80/81/82, S. 4689. (CONN. RODS. SHEFFIELD. S. 5243/4/5, S. 5277/8.

CRANKSHAFT ~~OR ROTOR SHAFT~~ LLOYD'S. 1381, 18-5-56 *GA*

FLYWHEEL SHAFT

THRUSTSHAFT LLOYD'S S. 5318, 18-5-56 *GA*

GEARING

INTERMEDIATE SHAFTS SHEFFIELD. S. 3828, S. 4165, S. 4338/9, S. 4350,

SCREW AND TUBE SHAFTS S. 3656<sub>2</sub> SPARE S. 3997. SHEFFIELD.

PROPELLERS

OTHER IMPORTANT ITEMS ECCENTRIC RODS (BELFAST) Y. 891/3/3/4/5, Z. 180/1/2/3, Z. 541/2

CROSSHEADS. SHEFFIELD. S. 5257/8/9/60/61.

Is the installation a duplicate of a previous case? YES

If so, state name of vessel "OBI" BELFAST REPORT 16128

Date of approval of plans for crankshaft 16-2-51 Straight shafting 1-1-55 Gearing - Clutch -  
 Separate oil fuel tanks 24-11-54 13-1-56 Pumping arrangements 7-7-55 Oil fuel arrangements 7-7-55  
 Cargo oil pumping arrangements 7-7-55 Air receivers 11-2-52 Donkey boilers SEE GLASGOW REPORT.  
 Dates of examination of principal parts:-  
 Fitting of stern tube 25-5-56 Fitting of propeller 1-6-56 Completion of sea connections 2-10-56 Alignment of crank shaft in main bearings 27-6-56  
 Engine checks & bolts 28-8 & 5-9-56 Alignment of gearing - Alignment of straight shafting 2-8-56 Testing of pumping arrangements 28-10-56  
 Oil fuel lines 26 & 26-10-56 Donkey boiler supports 21-9-56 Steering machinery 23-10-56 Windlass 23-10-56

Date of Committee FRIDAY 28 DEC 1956

Special Survey Fee **REG CONSTRUCTION £183-0-**

Decision **+ LMC 10-56**

" INSTALLATION £ 106-0  
 WELD STRUCTURE £ 18-18  
 AIR RECEIVERS £ 28-0  
 FORGINGS £ 45-15

Expenses

Date when A/c rendered 19-11-56.



© 2020 Lloyd's Register Foundation