

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 }  
On vessel }

745

First date

8<sup>TH</sup> MARCH 1956

Last date

24<sup>TH</sup> OCTOBER, 1956

## FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

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

Owners ELDER Dempster Lines Ltd Managers Port of Registry LIVERPOOL

Hull built at BELFAST By HARLAND &amp; WOLFF LTD Yard No. 1554 Year Month

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

Gearing made at By

Donkey boilers made at ANNAN By COCHRAN &amp; CO ANNAN LTD Blr. Nos. 20841 When 1956

Machinery installed at BELFAST By HARLAND &amp; 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 SECV TWO CYCLE SINGLE ACTING ECCENTRIC TYPE OPPOSED PISTON BURNING HEAVY OIL

MAIN RECIPROCATING ENGINES. Licence Name and Type No. HAW 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 &amp; 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 &amp; 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 &amp; 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 &amp; 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 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 &amp; FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system SECYS LETTER 1-55 14.1.55 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 AT SHRUNK PART. 485 mm Side 1040 mm Eccentric

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

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

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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 PRODUCTION (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 mm 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 5/8" Material SM STEEL

Minimum approved tensile strength 28-32 TONS Diameter of screwshaft cone at large end 15 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 case of stern tube Thickness of screwshaft liner at

bearings 13 1/8" Thickness between bearings 5/8" Material of screwshaft SM 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 LIONUMVITAE 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? 11.75 x 115 x 60 14.7

PROPELLER. Diameter of propeller 16' Pitch 11'-9" Built up or solid SOLID Total developed surface 16 sq

No. of blades 4 Blade thickness at top of root fillet 6 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.A.A.

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.

BEL ENGINE 2 @ CUFT No 734320. 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. MTE 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

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. ONE COMBINED PURIFIED & UNPURIFIED DIESEL OIL TANK. PORT AFT.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) NONE

		INDEPENDENT PUMPS 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								
No	FF		Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cool- ing	Sea	Feed Tanks	Lub. Oil		Boiler Feed	Salt Water Cool- ing	Fresh Water Cool- ing	Oil Fuel Tanks	Fire Main	Lub. Oil <small>COOLER</small>	Piston Cool- ing	HEAT EXCH
		ELECTRIC MOTOR = E.M.																	
1		MAIN S.W. CIRC° STB CENT. E.M.						X					X	X			X		X
1		AUX " " STB AFT E.M. CAPACITY 210 T/H.						X					X	X			X		X
1		BALLOON STAND BY CIRC° STB CENT E.M. CAPACITY 110 T/H	X	X	X			X					X	X		X			
1		FIRE & BILGE PORT FORD E.M.	X	X	X			X									X		
1		SANITARY STB FORD E.M.						X									X		
2		MAIN F.W. CIRC° STB E.M.					X							X					
2		FUEL VALVE COOLING FORD E.M.						FUEL VALVE COOLING TANK.							MAIN ENG FUEL VALVES.				
2		LUBRICATING OIL STB AFT E.M.								X							X	X	
2		FUEL OIL SERVICE STB AFT E.M.				X													
1		FUEL OIL TRANSFER PORT AFT E.M.				X													
1		FUEL OIL STAND BY PORT AFT STEAM				X													
1		DIESEL OIL TRANSFER PORT AFT E.M.				X													
2		BOILER FEED STB STEAM						X	X			X							
1		PALM OIL PORT FORD STEAM																	

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, 8 INCH.

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 @ 2 1/2" In tunnel 4 @ 2 1/2" P & S 1 @ 2 1/2" P & S

1 @ 3" STARBOARD Size and position of emergency bilge suction in machinery spaces 1 @ 1 1/2" 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 oil in bulk? (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)
PORT FORWARD	3.12 6 CYL VERTICAL	W.H. ALLEN & CO LTD	LONDON No 138385	
PORT AFT	AIRLESS INJECTION	BEDFORD	" "	
STARBOARD FORWARD	NORMALLY ASPIRATED	"	" "	
STARBOARD AFT	"	"	" "	
PORT FORWARD	3 1/2 HP SINGLE CYLINDER LISTER DIESEL ENGINE	LISTER	SOUTHAMPTON D 8764	EMERGENCY AIR COMPRESSOR

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 COLUMBIA COMPOSIT OIL FIRED & 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 36 HP ELECTRIC MOTOR ONE 3 CYL 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 GALL FORTH SIRE APT 12 @ 20 GALL FORTH

FIRE EXT. 2 @ 10 CUFT SAND BINS, STEAM SMOTHERING AROUND D.B. PYRENG INERT GAS FIRE EXTINGUISHING SYSTEM (PLEASE SEE LONDON REP No 13355)

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

George H. Walton

Secretary

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## 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  $\boxplus$  LMC 10-56 TS. CL. D.B. 120 lbs

A. Fairclough J. Smith

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

THRUST SHAFT 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. 36562 SPARE S. 3997. SHEFFIELD.

PROPELLERS

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

CROSS HEADS. SHEFFIELD. S. 5257/8/9/60/61.

Is the installation a duplicate of a previous case? YES

If so, state name of vessel

HEWLETT YARD N° 1448/9, 1479 & 1546  
"OBI" BELFAST REPORT 16128

Date of approval of plans for crankshaft 16-2-51

Straight shafting 14-1-55

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 chocks & 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 26-10-56

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

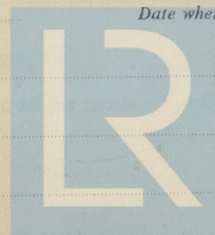
AIR RECEIVERS £28-0

FORGINGS £45-15

Expenses

Date when A/c rendered

19-11-56.



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