

Rpt. 4b

Date of writing report **23rd May, 1957.**Received London **28 MAY 1957**Port **Manchester** No. **17848.**Survey held at **MANCHESTER.**In shops **8.**First date **27.2.57.**Last date **10.5.57.**

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. \_\_\_\_\_ Name **S.S. "d'VORA" (Re-engining).** Gross tons \_\_\_\_\_

Owners **Mercury Fisheries Ltd.** Managers \_\_\_\_\_ Port of Registry \_\_\_\_\_ Year \_\_\_\_\_ Month \_\_\_\_\_

Hull built at \_\_\_\_\_ By **Cook, Welton & Gemmell.** Yard No. \_\_\_\_\_ When \_\_\_\_\_

Main Engines made at **Openshaw.** By **Crossley Brothers Ltd.** Eng. No. **147915.** When **1957.**

Gearing made at \_\_\_\_\_ By \_\_\_\_\_ Contract No. **11810.**

Donkey boilers made at \_\_\_\_\_ By \_\_\_\_\_ Blr. Nos. \_\_\_\_\_ When \_\_\_\_\_

Machinery installed at \_\_\_\_\_ By \_\_\_\_\_ When \_\_\_\_\_

Particulars of restricted service of ship, if limited for classification \_\_\_\_\_

Particulars of vegetable or similar cargo oil notation, if required \_\_\_\_\_

Is ship to be classed for navigation in ice? \_\_\_\_\_ Is ship intended to carry petroleum in bulk? \_\_\_\_\_

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

Is the refrigerating machinery compartment isolated from the propelling machinery space? \_\_\_\_\_ Is the refrigerated cargo installation intended to be classed? \_\_\_\_\_

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.

(a) Direct Drive to Propeller at 430 R.P.M.  
(b) Thro' 4:1 Gears " at 600 R.P.M.

No. of main engines **One.** No. of propellers **One.** Brief description of propulsion system **HRN6/60 Heavy Oil.**

MAIN RECIPROCATING ENGINES. Licence Name and Type No. \_\_\_\_\_

No. of cylinders per engine **6.** Dia. of cylinders **10 1/2".** stroke(s) **13 1/2".** 2 or 4 stroke cycle **Two.** Single or double acting **Single.**

Maximum approved BHP per engine **800.** at **600.** RPM of engine and **150.** RPM of propeller.

Corresponding MIP **92 psi.** (For DA engines give MIP top & bottom) Maximum cylinder pressure **950 psi.** Machinery numeral **160.**

Are the cylinders arranged in Vee or other special formation? **In Line.** If so, number of crankshafts per engine \_\_\_\_\_

TWO STROKE ENGINES. Is the engine of opposed piston type? **No.** If so, how are upper pistons connected to crankshaft? \_\_\_\_\_

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 \_\_\_\_\_

**One, Two Tier Double Acting Scavenge, Driven from Crankshaft.**

No. of exhaust gas driven scavenge blowers per engine \_\_\_\_\_ 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 \_\_\_\_\_ No. of scavenge air coolers **None.** Scavenge air pressure at full power **2 p.s.i.** Are scavenge manifold explosion relief valves fitted? **Yes.**

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

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

TWO & FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel **One.** Inlet **—** Exhaust **—** Starting **One.** Safety **One.**

Material of cylinder covers **C.I.** Material of piston crowns **C.I.** Is the engine equipped to operate on heavy fuel oil? **Yes.**

Cooling medium for:—Cylinders **Water.** Pistons **Lub.Oil.** Fuel valves **—** Overall diameter of piston rod for double acting engines **—**

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

Is the engine of crosshead or trunk piston type? **Trunk.** Total internal volume of crankcase **62 Cu.ft.** No. and total area of explosion relief devices **3 - 41.00 sq."**

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? **—** How is the engine started? **Compressed Air.**

Is the engine secured directly to the tank top or to a built-up seating? **—**

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? **6 Hours.**

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system \_\_\_\_\_ State barred speed range(s), if imposed **No at 430 RPM Yes at 600 RPM.**

for working propeller \_\_\_\_\_ For spare propeller \_\_\_\_\_ Is a governor fitted? **Yes.** Is a torsional vibration damper or detuner fitted to the shafting? **—**

Where positioned? **Ford. End.** Type **To be decided when gear box fitted.** No. of main bearings **7.** Are main bearings of ball or roller type? **Plain.**

Distance between inner edges of bearings in way of crank(s) **14.11/16"** Distance between centre lines of side cranks or eccentrics of opposed piston engines \_\_\_\_\_

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

Diameter of journals **7 1/2".** Diameter of crankpins **7 1/2".** Centre **7 1/2".** Breadth of webs at mid-throw **9 1/2".** Axial thickness of webs **3.23/32".**

If shrunk, radial thickness around eyeholes \_\_\_\_\_ Are dowel pins fitted? **—** Crankshaft material **O.H. Steel.** Pins **—** Journals **—** Webs **—** Minimum approved tensile strength **35/45 T.S.I.**

Diameter of flywheel **35 1/2".** Weight **806 lbs.** Are balance weights fitted? **Yes.** Total weight **258 lbs.** Radius of gyration **7.66"**

Diameter of flywheel shaft \_\_\_\_\_ Material **—** Minimum approved tensile strength \_\_\_\_\_

Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) **Flywheel bolted to Crankshaft.**

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MAIN GAS TURBINES

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  
(A small diagram should be attached showing gas cycle.) 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? .....

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?.....

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? ..... Are gear bearings of ball or roller type? ..... \*

Where is the propeller thrust bearing located? .....

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?

Shaft separate or integral with crank or wheel shaft? ..... Diameter of intermediate shaft ..... Material .....

Minimum approved tensile strength ..... Diameter of screwshaft cone at large end ..... Is screwshaft fitted with a continuous liner? .....

Diameter of tube shaft. (If these are separate shafts) ..... Is tube shaft fitted with a continuous liner in way of stern tube ..... Thickness of screw/tube shaft liner at bearings ..... Thickness between bearings ..... Material of screw/tube shaft ..... Minimum approved tensile strength .....

Is an approved oil gland fitted? ..... If so, state type ..... Length of bearing next to and supporting propeller .....

Material of bearing ..... 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? .....

No. of blades ..... Blade thickness at top of root fillet ..... Blade material ..... Moment of inertia of dry propeller .....

If propeller is of special design, state type ..... Is propeller of reversible pitch type? ..... If so, is it of approved design? .....

State method of control ..... Material of spare propeller ..... Moment of inertia .....

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate).....

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) TWO, Each 15 Cu.Ft. Capacity.

How are receivers first charged? ..... Maximum working pressure of starting air system ..... Are the safety devices in accordance with the Rules? ..... Has the starting of the main engines been tested and found satisfactory? .....

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure.....

MAIN ENGINE DRIVEN PUMPS (No. and Purpose)		PUMP NO.		CAPACITY	
ONE BILGE	"	3812	"	for 600 R.P.M.	
ONE ENGINE LUB. OIL	"	2400	"		
ONE LIFT	"	3428	"		

Service for which each pump is connected to be marked thus X

**INDEPENDENT PUMPS**  
Name below essential pumps, state position and how driven. Give capacity of bilge pumps.

[illegible]

No. and size connected to main bilge line in main engine room ..... In tunnel .....

In aux. engine room ..... Size and position of direct bilge suction in machinery spaces .....

..... Size and position of emergency bilge suction in machinery spaces .....

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

**OIL ENGINE AUXILIARIES**

[illegible]

Is electric current used for essential services at sea? \_\_\_\_\_

If so, state the minimum No. and capacity of generators required in order that the ship may operate \_\_\_\_\_

\_\_\_\_\_ generator driven by Main Engine? No

at sea.....

STEAM INSTALLATION. No. of donkey boilers burning oil fuel..... W.P..... Type.....

Position ..... W.P. ....

Are these boilers also heated by exhaust gas? ..... No. of donkey boilers heated by exhaust gas only? .....

..... heated boilers deliver steam directly to .....

Type ..... Position ..... Port and No. of report on donkey .....

Is steam essential for operation of the ship at sea? \_\_\_\_\_ Are any steam pipes over 3 ins. bore? \_\_\_\_\_  
boilers \_\_\_\_\_  
\_\_\_\_\_ maintenance of pipes, valves, controls, etc., in accordance with the Rules? \_\_\_\_\_ No. of oil burning pressure \_\_\_\_\_

material?.....

units..... \* No. of steam condensers..... No. of Evaporators.....

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars).....

Have the Rule Requirements for fire extinguishing arrangements been complied with? ..... Brief description of arrangements .....

Has all the machinery been tried under full working conditions and found satisfactory? Yes. Date and duration of trial 10/1/50

power sea trials of main engines.....

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~~).

*Leeds*

istics (*strike out words not applicable*).



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.

This heavy oil engine has been built under special survey of tested materials and in accordance with the Rules, approved plans and Secretary's letters. The material, as far as can be seen, is sound and free from defects. The workmanship is good. The engine, coupled to a dynamometer, was tested at the Engine Builder's Works under the following conditions of loading - 6 hours 100% engine rating, 1 hour 10% overload, governing, manoeuvring.

N.B. Until such time as the gear box becomes available the engine will be run at 430 R.P.M., with direct drive to propeller. At 430 R.P.M. the engine will be run without torsion damper. When gear box is fitted, engine will be run at 600 R.P.M.

Torsional vibration calculations have not yet been submitted.

Attached hereto:- Crankshaft Cert. F.67564.

Thrustshaft Cert. F.8775.

Conn. Rod Certs. C.24912.

L.V. Hansen

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 S.83, 84. L.V.H. 8.4.57. B'ham.

CRANKSHAFT OR ROTORSHAFT 3936 L.V.H. 56 RF5 Shf.

FLYWHEEL SHAFT

THRUSTSHAFT 4837 LWH 11.5.54. Mch.

GEARING

INTERMEDIATE SHAFTS

SCREW AND TUBE SHAFTS

PROPELLERS

OTHER IMPORTANT ITEMS

Is the installation a duplicate of a previous case? If so, state name of vessel

Date of approval of plans for crankshaft 19.3.57. Straight shafting Gearing Clutch

Separate oil fuel tanks Pumping arrangements Oil fuel arrangements

Cargo oil pumping arrangements Air receivers Donkey boilers

Dates of examination of principal parts:-

Fitting of stern tube Fitting of propeller Completion of sea connections Alignment of crankshaft in main bearings 4.5.57.

Engine chocks & bolts Alignment of gearing Alignment of straight shafting Testing of pumping arrangements

Oil fuel lines Donkey boiler supports Steering machinery Windlass

Date of Committee Special Survey Fee £52 :0 :0.

Decision

W

Expenses £2 :0 :0.

Date when A/c rendered 27.5.57



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