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 work report <sup>th</sup> 20 September, 1957. Received London LONDON No. 136520  
 by at Stanford, Sines No. of visits 3 In shops 3 First date 16.8.57 Last date 19<sup>th</sup> September 1957  
 On vessel

# ST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

Name \_\_\_\_\_ Gross tons \_\_\_\_\_  
 Managers \_\_\_\_\_ Port of Registry \_\_\_\_\_ Year \_\_\_\_\_ Month \_\_\_\_\_  
 By Cheng Lee Yard No. 701 When \_\_\_\_\_  
 By Blackstone & Co. Ltd. Eng. No. 80554 When 1957 Sept.  
 By \_\_\_\_\_ Blr. Nos. \_\_\_\_\_ When \_\_\_\_\_  
 By \_\_\_\_\_ When \_\_\_\_\_  
 s of restricted service of ship, if limited for classification \_\_\_\_\_  
 s of vegetable or similar cargo oil notation, if required \_\_\_\_\_  
 be classed for navigation in ice? \_\_\_\_\_ Is ship intended to carry petroleum in bulk? \_\_\_\_\_  
 If so, is it for cargo purposes? \_\_\_\_\_ Type of refrigerant \_\_\_\_\_  
 refrigerating machinery compartment isolated from the propelling machinery space? \_\_\_\_\_ Is the refrigerated cargo installation intended to be classed? \_\_\_\_\_

wing 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 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 ed not be repeated below, but the port and report number should be stated.

main engines \_\_\_\_\_ No. of propellers \_\_\_\_\_ Brief description of propulsion system \_\_\_\_\_  
**RECIPROCATING ENGINES.** Licence Name and Type No. Liter-Blackstone ERMGR6 type vertical Diesel oil engine  
 cylinders per engine 6 Dia. of cylinders 8 3/4" stroke 11 1/2" 2 or 4 stroke cycle 4 Single or double acting Single  
 m approved BHP per engine 303 at 750 RPM of engine and \_\_\_\_\_ RPM of propeller \_\_\_\_\_  
 nding MIP 97.5 lbs/a" (For DA engines give MIP top & bottom) Maximum cylinder pressure 800 lbs/a" Machinery numeral 67.4 60.6  
 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? \_\_\_\_\_ If so, how are upper pistons connected to crankshaft? \_\_\_\_\_  
 exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? \_\_\_\_\_ No. and type of mechanically driven scavenge pumps or blowers per and how driven \_\_\_\_\_  
 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? \_\_\_\_\_  
 nd-by or emergency pump or blower is fitted, state how driven \_\_\_\_\_ No. of scavenge air coolers \_\_\_\_\_ Scavenge air pressure at full \_\_\_\_\_  
 Are scavenge manifold explosion relief valves fitted? \_\_\_\_\_

**STROKE ENGINES.** Is the engine supercharged? No. Are the undersides of the pistons arranged as supercharge pumps? No. No. of exhaust gas driven blowers per NONE  
 No. of supercharge air coolers per engine \_\_\_\_\_ Supercharge air pressure \_\_\_\_\_ Can engine operate without supercharger? \_\_\_\_\_

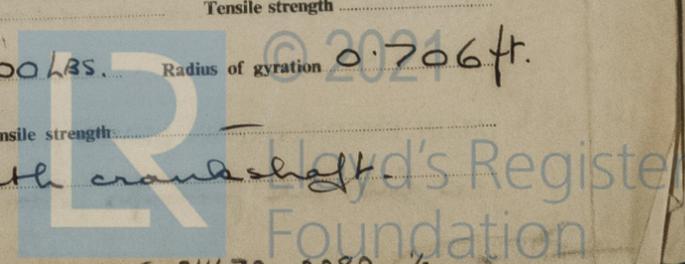
**& FOUR STROKE ENGINES—GENERAL.** No. of valves per cylinder: Fuel 1 Inlet 1 Exhaust 1 Starting 2 <sup>IN</sup> SERIES Safety 1  
 il of cylinder covers C.I. Material of piston crowns Aluminium Is the engine equipped to operate on heavy fuel oil? No.  
 medium for:—Cylinders Fresh water Pistons NONE Fuel valves NONE Overall diameter of piston rod for double acting engines \_\_\_\_\_  
 od fitted with a sleeve? \_\_\_\_\_ Is welded construction employed for: Bedplate? No. Frames? No. Entablature? No. Is the crankcase separated from the  
 de of pistons? No. Is the engine of crosshead or trunk piston type? Trunk Total internal volume of crankcase 44 cuft. No. and total area of explosion relief  
4 x 44" Are flame guards or traps fitted to relief devices? Yes. Is the crankcase readily accessible? Yes. If not, must the engine be removed for  
 ul of bearings, etc? \_\_\_\_\_ Is the engine secured directly to the tank top or to a built-up seating? \_\_\_\_\_ How is the engine started? compressed air  
 he engine be directly reversed? No. If not, how is reversing obtained? reverse/reduction gear box

he engine been tested working in the shop? Yes. How long at full power? 4 hours + 1 hour @ 10% overload.  
**CRANK & FLYWHEEL SHAFTING.** Date of approval of torsional vibration characteristics of the propelling machinery system 22/1/58 State barred speed range(s), if imposed \_\_\_\_\_  
 working propeller \_\_\_\_\_ For spare propeller \_\_\_\_\_ Is a governor fitted? Yes. Is a torsional vibration damper or detuner fitted to the shafting? Yes.  
 e positioned? In flywheel coupling Type i) Atlas hydraulic No. of main bearings 8 Are main bearings of ball or roller \_\_\_\_\_  
 Distance between inner edges of bearings in way of crank(s) 10 1/16" Distance between centre lines of side cranks or eccentrics of opposed piston engines \_\_\_\_\_

shaft type: Built, semi-built, solid. (State which) Solid  
 eter of journals 6 3/4" Diameter of crankpins Centre 6 1/8" Breadth of webs at mid-throw 7 3/4" Axial thickness of webs 2 3/32"  
 unks, radial thickness around eyeholes \_\_\_\_\_ Are dowel pins fitted? \_\_\_\_\_ Crankshaft material Journals EN8 Minimum \_\_\_\_\_  
 Webs \_\_\_\_\_ Tensile strength \_\_\_\_\_

eter of flywheel 38" Weight 1860 lbs. Are balance weights fitted? Yes. Total weight 300 lbs. Radius of gyration 0.206 ft.  
 eter of flywheel shaft \_\_\_\_\_ Material \_\_\_\_\_ Minimum approved tensile strength \_\_\_\_\_  
 heel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with crankshaft

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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. 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. 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 minute at full power. Gas delivery pressure. Gas delivery temperature. Have the turbines and attached equipment been 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. Are the wheels of welded construction? Is gearcase of welded construction? Has the wheel/gearcase been heat treated on 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 description and, for clutches, state how operated. Oil operated clutches in reverse/reduction gear box. Combined flexible coupling and nodal damper.

Can the main engine be used for purposes other than propulsion when declutched? No. If so, what?

STRAIGHT SHAFTING. Diameter of thrustshaft. Material. Minimum approved tensile strength.

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 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 shaft liners readily visible in dry dock?

PROPELLER. Diameter of propeller. Pitch. Built up or solid. Total developed surface.

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.

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine. Can they be declutched?

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).

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

COOLERS. No. of main engine fresh water coolers. No. of main engine lubricating oil coolers.

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). 2 water pumps, one raw and one fresh. 2 lub. oil pumps, one pressure and one scavenge.

DEPENDENT PUMPS. Essential pumps, state position and capacity. Give capacity of bilge pumps.

Table with columns for SUCTION (Bilge Main, Bilge Direct, Ballast Main, Oil Fuel, Fresh Water Cooling, Sea, Feed Tanks, Lub. Oil) and DELIVERY (Boiler Feed, Salt Water Cooling, Fresh Water Cooling, Oil Fuel Tanks, Fire Main, Lub. Oil, Piston Cooling). Includes handwritten 'X' marks indicating connections.

DUCTIONS. No. and size in each hold, deep tank or pump room. Size connected to main bilge line in main engine room. Size and position of direct bilge suction in machinery spaces. Size and position of emergency bilge suction in machinery spaces. Do the piping arrangements comply with the Rules including requirements for ships carrying petroleum in bulk, cargo oil or classed for navigation in ice? (strike out words not applicable).

STEAM & OIL ENGINE AUXILIARIES

Table with columns: Position of each, Type, Made by, Port and No. of Rpt. or Cert., Driven Machinery (For electric generators, state output).

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.

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

Are these boilers also heated by exhaust gas? No. of donkey boilers heated by exhaust gas only? W.P. Can the exhaust heated boilers deliver steam directly to range or do they operate only as economisers in conjunction with oil fired boilers? 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? If so, what is their For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? No. of oil burning pressure

No. of steam condensers. No. of Evaporators.

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

Are the safety 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? Date and duration of full sea trials of main engines. Does this machinery installation contain any features of a novel or experimental nature? (Give particulars)

regarding description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (strike out words not applicable).

Builder logo for BLACKSTONE & CO. LTD. Lloyd's Register Foundation. Includes signature of A. Granger and date 0080 2/2.

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 work recommendations for classification, including any special notation to be assigned. Where existing machinery is submitted for classification the circumstances should be explained as follows.

This engine, WORKS ORDER N° BM 90273 P, has been built under SPECIAL SURVEY in accordance with APPROVED PLANS and RULES OF THE SOCIETY, from materials manufactured under the SUPERVISION of SURVEYORS to the SOCIETY; WORKMANSHIP throughout is good. SUBJECT to the normal vibration characteristics of the dynamic system engine, line shafting and propeller being submitted to and approved by the SOCIETY the engine is eligible to be fitted to a classed vessel in my opinion.

*W. W. Waald*

Engine Surveyor to Lloyd's Register

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

RODS 2623K 207; 2623K 234; S.6; 36666K 214; 2 of 36666K 187, all stamped W.W. LON. 22. 8. 57 covered by batch certificates: - LDS. C 28449; C 28770; C 28447; C 28069; + BIR: C 2490  
 CRANKSHAFT OR ROTOR SHAFT 762901 <sup>8660/</sup> 567 <sup>W. Se. W.W.</sup> AUG. LON: 16. 8. 57.

FLYWHEEL SHAFT

THRUST SHAFT

GEARING

INTERMEDIATE SHAFTS

SCREW AND TUBE SHAFTS

PROPELLERS

OTHER IMPORTANT ITEMS by liner block, liners & heads, Lloyd's test 100 lbs. W.W. LON. 16. 8. 57

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

Date of approval of plans for crankshaft 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 crank shaft in main bearings

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 £29/7/6

Decision

Expenses £5/6/-

Date when A/c rendered 7. OCT 1957

