

No. of writing report: 2nd April 1957
 Received London: 26 APR 1957
 Port: Bilbao
 No.: 12130
 No. of visits: 10
 First date: 22.6.56
 Last date: 26.3.57.

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

In R.B. NE. N°8-92266 Name: Single Screw, Hopper Barge "ARTECHE" Gross ton: 145
 Owner: Iberduero S.A. Managers: - Port of Registry: Bilbao
 Built at: Murueta (Vizcaya) By: Astilleros de Murueta, S.A. Yard No: 26 Year Month: 1957-3
 Engines made at: Bermeo By: Construcciones Echevarria Eng. No: 120 When: 1956
 Machinery installed at: Murueta By: Construcciones Echevarria When: 1957

Is to be classed for navigation in ice? No Is ship intended to carry petroleum in bulk? No
 Refrigerating machinery fitted? No If so, is it for cargo purposes? Type of refrigerant:
 Refrigerating machinery compartment isolated from the propelling machinery space? None Is the refrigerated cargo installation intended to be classed?

Brief description of propulsion system: Oil Eng. coupled direct to propeller through reverse gear, clutch and shafting.

RECIPROCATING ENGINES. Licensee Name and Type No: Construcciones Echevarria type 4-M-22.
 Cylinders per engine: 4 Dia. of cylinders: 220 mm. stroke: 350 mm. 2 or 4 stroke cycle: 2 Single or double acting: Single
 Nominal approved BHP per engine: 200 at 430 RPM of engine and 430 RPM of propeller.
 Working MIP: 5 Kg/cm². (For D.A. engines give MIP top & bottom) Maximum cylinder pressure: 58 Kg/cm². Machinery numeral: 40
 Cylinders arranged in V or other special formation? No If so, number of crankshafts per engine:

STROKE ENGINES. Is the engine of opposed piston type? No If so, how are upper piston connected to crankshaft?
 Exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? through ports No. and type of mechanically driven scavenge pumps or blowers per engine:
 and how driven: 1 D.A. scavenge pump, dia. 400 mm. Stroke 170 mm. Cap. 37 m³. per min. Approx.
 Exhaust gas driven scavenge blowers per engine: None Where exhaust gas driven blowers are not fitted, are the engine systems able to blow out of action?
 Emergency pump or blower is fitted, state how driven: None No. of scavenge air coolers: Scavenge air pressure at full load:
 18 Kg/cm². Are scavenge manifold explosion relief valves fitted? Yes

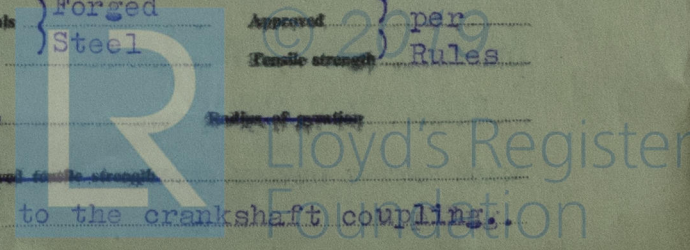
STROKE ENGINES. Is the engine supercharged? Are the undersides of the pistons arranged as supercharge pumps? No. of exhaust gas driven blowers per engine:
 No. of supercharge air coolers per engine: Supercharge air pressure: Can engine operate without supercharger?

FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Inlet: 1 Inlet: None Exhaust: None Starting: 1 Safety: 1
 Material of cylinder covers: Cast iron Material of piston crown: Cast iron Is the engine equipped to operate on heavy fuel oil? No
 Lubrication for:—Cylinders: Salt water Pistons: None Fuel valves: None Overall diameter of piston end for double acting engine:
 Is welded construction employed for: Bedplate? No Frames? No Entablature? No Is the crankcase separated from the
 of pistons? No Is the engine of crosshead or trunk piston type? Trunk piston Total internal volume of crankcase: 0.821 m³. No. and total area of explosion relief
 Area: 102cm². Are flame guards or traps fitted to relief devices? Yes Is the crankcase readily accessible? Yes If not, must the engine be removed from
 of bearings, etc? No Is the engine secured directly to the tank top or to a built-up seating? Built-up seating How is the engine started? Comp. air.
 Can engine be directly reversed? No If not, how is reversing obtained? Through reversing gear and clutch
 Has engine been tested working in the shop? Yes How long at full power? 9 hours at 200 and 3 hours at 220 B.H.P.

FLYWHEEL SHAPING. Date of approval of torsional vibration characteristics of the propelling machinery system: 7-8-56 State burst speed range(s), if imposed:
 Propeller: None For spare propeller: None Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? No
 Type: No. of main bearings: 7 Are main bearings of half or roller type?
 Distance between inner edges of bearings in way of crank(s): 255 mm. Distance between centre lines of side cranks or eccentrics of opposed piston engines:

Shaft type: Built, semi-built, solid. (State which): Solid
 Diameter of journals: 140 mm. Diameter of crankpin: 135 mm. Breadth of webs at mid-throw: 230 mm. Axial thickness of webs: 68 mm.
 Crankshaft material: Journals: Forged Steel Webs: Steel
 Diameter of flywheel: 725 mm. Weight: 450 Kgs. Are balance weights fitted? No Total weight: Radius of gaskets:
 Shaft: separate, integral with crankshaft, integral with thrustshaft. (State which): Flywheel is bolted to the crankshaft coupling.

11/6/57



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 _____
 (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 _____

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 stroke _____

minutes at full power _____ Gas delivery pressure _____ Gas delivery temperature _____ Have the turbines and attached equipment been tested _____

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 spur type? _____

PCD of pinions: First reduction _____ Second reduction _____ PCD of wheels: First reduction _____

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/housing 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 crankshaft and propeller shaft, describe and, for clutches, state how operated. _____

Hand operated friction clutch. _____

Can the main engine be used for purposes other than propulsion when decoupled? Yes _____ If so, what? For pumping bilges in emergency case _____

STRAIGHT SHAFTING. Diameter of thrust shaft _____

Material Elec. S. Forged Minimum approved tensile strength As per Rules _____

Shaft separate or integral with crank or wheel shaft? Separate _____ Diameter of intermediate shaft 110 mm. _____ Material Elec. S. Forged _____

Minimum approved tensile strength As per Rules Diameter of crankshaft cone at large end 110 mm. _____ Is crankshaft fitted with a continuous fillet? Yes _____

Diameter of tube shaft. (If these are separate shafts) None _____ Is tube shaft fitted with a continuous fillet in any of star tube _____

bearings 11 mm. _____ Thickness between bearings 10 mm. _____ Material of screw/tube shaft Elect. Steel Forged _____

is an approved oil gland fitted? No _____ If so, state type _____ Length of bearing next to and supporting propeller 435 mm. _____

PROPELLER. Diameter of propeller _____

Pitch 820 mm. _____ Built up or solid Solid _____ Total developed surface 0.45 _____

No. of blades 3 _____ Blade thickness at top of root fillet 40 mm. _____ Blade material bronze _____ Moment of inertia of dry propeller 31 Kg _____

Is propeller of reversible pitch type? No _____ If so, is it of approved design? _____

Material of spare propeller Cast iron _____ Moment of inertia _____

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine _____

None _____ Can they be detached? _____

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

driven by an auxiliary oil engine fitted at Eng. Room (p.s.). Bcl. Cert. No. D.420. _____

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Two main starting air receivers _____

fitted at Eng. Room (ss). Capacity of each 105 lts. Certificate Bbo. No. 1950. _____

How are receivers first charged? By an aux. compressor driven _____ Maximum working pressure of starting air system 30 Kg/cm². _____ Are the receivers _____

by hand started oil Eng. _____

compliance 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 _____

None _____ No. of main engine lubricating oil coolers One _____

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

Daily service tank eng. room _____

Capacity 0.458 m³. _____

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) _____

Two: 1 salt water cooling pump and bilge pump. Capacity _____

of each 4380 lts/hour. _____

INDEPENDENT PUMPS

Below essential pumps, state position and capacity of bilge pumps.

	SUCTION										DELIVERY						
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lab. Oil	Buoyancy Compt.	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lib. Oil	Plating Cooling	Sea
Large pump eng. room																	
(s.s.) driven by aux.																	
Eng. through belt	X	X	X			X		X		X			X				X
Capacity 30 T/h.																	
and pump eng. room (ps)					X								X				

SUCTIONS. No. and size in each hold, deep tank or pump room. Buoyancy tanks 3 (p.s.) 2" dia. Deep or ballast tank _____

ward 1 of 76 mm. dia. _____

Is pipe connected to main bilge line in main engine room 1 (ss) of 2" dia. _____

Size and position of direct bilge suction in machinery space 1 (ps) of _____

dia. _____ Size and position of emergency bilge suction in machinery space 1 (ss) of 2" dia. _____

Is bilge or ballast system fitted with means for separating oily water on the overboard discharge side? No _____

Do the piping arrangements comply with the Rules including _____

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Prime Machinery (For electric generators, state output)
room port side	20 BHP. Oil Engine	Maquinista Terrestre y Maritima	Bcl. Cert. No. D.420	10 Kw. Generator Aux. compressor & bilge pump

Is current used for essential services at sea? No _____

Is an electric generator driven by Main Engine? None _____

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? _____

Can the exhaust heated boilers deliver steam directly to _____

Part and No. of report on donkey _____

Are 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 _____

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

Hand gear. _____

Requirements for fire extinguishing arrangements been complied with? Yes _____ Brief description of arrangements 1 hydrant of 2" dia. with _____

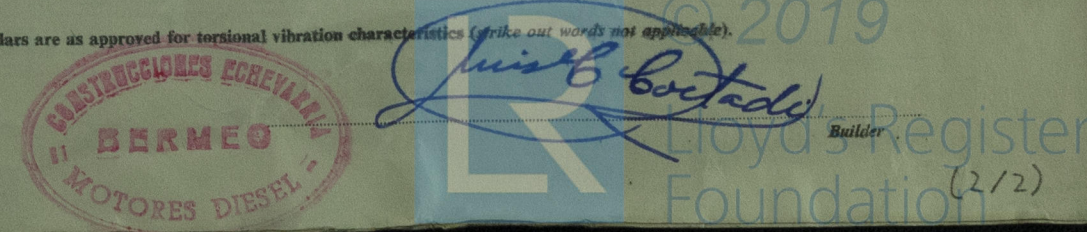
and 2 portable fire extinguishers of 6 lts. each. _____

Are the gas 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 trial _____

3 hours on the 6.2.57. _____ Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) _____

No _____

description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (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 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 of this vessel has been constructed and installed on board under special survey, in accordance with the Rules, approved plans and Secretary's letters. Materials used and workmanship are good.

Satisfactory trials under full power working condition carried out in shop at sea.

This machinery in my opinion is entitled to be classed in this Society with the record of LMC 3,57 and notation of CL(Screw shaft) "Oil Engine".

Enclosures:-

Copy of interim certificates.- Machinery plans.- Forging certificates.- List of spare pieces.- Air receivers - Aux. engine certificate. - Propeller certificate.

Francis
 Engineer Surveyor to Lloyd's Register of S...

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

RODS Connecting rods:- Lloyd's Bbo. No 3416, 3417, 3418, 3419 A.B. 3.9.56 F.L. 19.9.56

CRANKSHAFT OR ROTORSHAFT Lloyd's Bbo. No 3474 A.B. 10.8.56 F.L. 23.8.56.

~~FLYWHEEL SHAFT~~

THRUSTSHAFT and combined clutch:- Lloyd's Bbo. No 3475 A.B. 21.8.56 F.L. 28.8.56.

~~GEARING~~

INTERMEDIATE SHAFTS Lloyd's Bbo. No 3475 A.B. 21.8.56 F.L. 28.8.56

SCREW AND TUBE SHAFTS Lloyd's Bbo. No 3475 A.B. 21.8.56 F.L. 28.8.56

PROPELLERS Lloyd's Bbo. No 3597 F.L. 19.9.56

OTHER IMPORTANT ITEMS Scavenge pump crank shaft - Lloyd's Bbo. No 2488. A.B. 14.6.56.

Shafting cast steel coupling flanges (4) - Lloyd's Bbo. No 3443 A.B. 28.8.56

Is the installation a duplicate of a previous case? No If so, state name of vessel

Date of approval of plans for crankshaft 28.5.56 Straight shafting 7.8.56 Gearing 7.8.56 Clutch 7.8.56

Separate oil fuel tanks Locally 28.3.57 Pumping arrangements 17.7.56 Oil fuel arrangements

Complete oil pumping arrangements Air receivers 28.5.56 Donkey boilers

Dates of examination of principal parts:-

Fitting of stern tube 29.9.56 Fitting of propeller 4.12.56 Completion of sea connections 4.12.56 Alignment of crank shaft in main bearings 23

Engine checks & bolts 19.1.57 Alignment of gearing Alignment of straight shafting 19.1.57 Testing of pumping arrangements

Oil fuel lines 4.12.57 Donkey boiler supports Steering machinery 6.2.57 Winches 19.1.57

Date of Committee Construction 8.4.57 Installation 8.4.95 Ptas. Special Survey Fee

Decision LMC

ES 3.57 TSCL 860 225

Expenses

DATE WHEN A/C RENDERED 8.4.57



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