

Rpt. 4b

Date of writing report 28-2-58

Received London

Port BARCELONA

No. 6760

Survey held at Barcelona

No. of visits In shops 16  
On vessel

First date 2-7-56

Last date 13-1-58

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name Gross tons

Owners Empresa Nacional Elcano

Managers

Port of Registry

Hull built at

By

Yard No.

Year Month

Main Engines made at Barcelona

By Maquinista Terrestre Maritima

Eng. No. 5624

When

When 1957

Gearing made at

By

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.

No. of main engines 1

No. of propellers 1

Brief description of propulsion system

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Burmeister & Wain MTM 674 VTBF 160

No. of cylinders per engine 6

Dia. of cylinders 740 mm

stroke(s)

1600 mm

2 or 4 stroke cycle 2

Single or double acting

single

Maximum approved BHP per engine 7500

at 115

RPM of engine and 115

RPM of propeller.

Corresponding MIP 7.9 kg/cm<sup>2</sup>

(For DA engines give MIP top & bottom)

Maximum cylinder pressure

55 kg/cm<sup>2</sup>

Machinery numeral

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? 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? cyl. covers

No. and type of mechanically driven scavenge pumps or blowers per engine and how driven

No. of exhaust gas driven scavenge blowers per engine 2

Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action? yes

If a stand-by or emergency pump or blower is fitted, state how driven 1 - electric driven

No. of scavenge air coolers 2

Scavenge air pressure at full power

1.45 kg/cm<sup>2</sup>

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

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 2

Inlet

Exhaust 1

Starting 1

Safety 1

Material of cylinder covers cast steel

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

oil

Overall diameter of piston rod for double acting engines

Is the rod fitted with a sleeve?

Is welded construction employed for: Bedplate?

Frames?

Entablature?

Is the crankcase separated from the underside of pistons? yes

Is the engine of crosshead or trunk piston type? yes

Total internal volume of crankcase

Appr. for B&W

No. and total area of explosion relief devices

13 - 6898.5 cm<sup>2</sup>

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?

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

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? 18 hours normal and 6 hours at 10% overload.

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 7-12-56

State barred speed range(s), if imposed

for working propeller 56/67 rpm

For spare propeller

Is a governor fitted? yes

Is a torsional vibration damper or detuner fitted to the shafting?

Where positioned?

Type

No. of main bearings 8

Are main bearings of ball or roller type?

no

Distance between inner edges of bearings in way of crank(s) 958 mm

Distance between centre lines of side cranks or eccentrics of opposed piston engines

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

Diameter of journals 550 mm

Diameter of crankpins

Centre 550 mm

Breadth of webs at mid-throw 1180 mm

Axial thickness of webs 335 mm

crankpin journals

300 mm

Side 320 mm

Pins

Minimum

If shrunk, radial thickness around eyeholes

Are dowel pins fitted?

Crankshaft material Journals

forged steel

Approved

Webs

cast steel

Tensile strength

Diameter of flywheel 1903 mm

Weight 2204 kgs

Are balance weights fitted? no

Total weight

Radius of gyration

Diameter of flywheel shaft 520 mm

Material S.M. steel

Minimum approved tensile strength

rule

Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft.

(State which) integral with thrustshaft

Lloyd's Register Foundation



# 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 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 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 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?

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 devices 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 2 No. of main engine lubricating oil coolers 2

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) 1 bilge, 1 fire exting., 1 F. water, 1 S. water, 1 oil (drive

by chain from intermediate shaft)

## 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

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

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room

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).

## STEAM & OIL ENGINE AUXILIARIES

Position of each

Type

Made by

Port and No. of Rpt. or Cert.

Driven Machinery (For electric generators, state output)

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

at sea Is an electric generator driven by Main Engine?

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

Position

Is a superheater fitted? Are these boilers also heated by exhaust gas? No. of donkey boilers heated by exhaust gas only? 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 Is steam essential for operation of the ship at sea? Are any steam pipes over 3 ins. bore? If so, what is their

material? For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? No. of oil burning pressure

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 the spare gear required by the Rules been supplied? Has all the machinery been tried under full working conditions and found satisfactory? Date and duration of full-

power sea trials of main engines Does this machinery installation contain any features of a novel or experimental nature? (Give particulars)

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).



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 engine has been constructed under Special Survey in accordance with the Rules and Regulations, approved plans and Secretary's letters, and tried on bench under full working conditions with satisfactory results.

This machinery, in my opinion, is eligible to be classed in this Society and to have a notation of \*LMC with date, when the machinery has been installed on board and tried under working conditions to the Society's Surveyors satisfaction.

*Robert Stoddart*

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 LR No 3589, 3590, 3605, 3606, 3758, 3759 HB BCL. 2 & 16-7-56 9-11-56

CRANKSHAFT OR ROTORSHAFT LR 3783 23-11-56 HT BCL ✓

FLYWHEEL SHAFT } LR 3783 23-11-56 HT BCL

THRUSTSHAFT }

GEARING -

INTERMEDIATE SHAFTS -

SCREW AND TUBE SHAFTS -

PROPELLERS -

OTHER IMPORTANT ITEMS Covers.- LR 20 & 22-5-57 & 2-7-57 RWS BCL. Pistons.- LR 26-6-57 and 17-7-57 HB BCL. Liners and jackets 14 & 21-6-57 RWS BCL. Camshaft.- LR 3819 7-1-57 HB BCL. and 3835 31-1-57 RWS BCL. Starting air range.- RWS BCL 3-10-57.

Is the installation a duplicate of a previous case? -

If so, state name of vessel

Date of approval of plans for crankshaft 7-12-56

Straight shafting 7-12-56

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

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

FRIDAY 17 APR 1959

Special Survey Fee

Ptas. 16.635.-

Decision

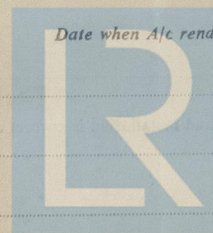
See Rpt. 1.

Expenses

1.000.-

Date when A/c rendered

28-2-58



Lloyd's Register Foundation