

Rpt. 4b

Date of writing report 21-2-59

Received London

31 MAR 1959

Port CADIZ

No. 2807

Survey held at CADIZ

In shops No. of visits

90

First date 23-3-57

Last date 13-2-59

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name **M.V. "BONIFAZ"** Gross tons **12942**

Owners **NAVIERA CASTILLA** Managers Port of Registry **CADIZ**

Hull built at **Cadiz** By **Astilleros de Cadiz, S.A.** Yard No. **47** Year Month When **1959**

Main Engines made at **BARCELONA** By **La Maquinista Terrestre y Maritima** Eng. No. **5624** When **1957**

Gearing made at **None** By **S.E.C.N. Sestao** P. 270

Donkey boilers made at **Assembled..... Cadiz** By **Astilleros de Cadiz, S.A.** Blr. Nos. **S. 269** When **1958**

Machinery installed at **CADIZ** By **Astilleros de Cadiz, S.A.** When **1959**

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? No Is ship intended to carry petroleum in bulk? Yes

Is refrigerating machinery fitted? Yes If so, is it for cargo purposes? No Type of refrigerant **NH3**

Is the refrigerating machinery compartment isolated from the propelling machinery space? Yes 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 **Direct drive by reversable engine**

MAIN RECIPROCATING ENGINES. Licence Name and Type No. **See Barcelona Report No 6760 (herewith)**

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 Kgs/cm²** (For DA engines give MIP top & bottom) Maximum cylinder pressure **55 Kgs/cm²** Machinery numeral **1500**

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? **Valves in 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 Kgs/cm²** 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 **None** Exhaust **One** Starting **One** Safety **One**

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 **Fresh water** Pistons **Oil** Fuel valves **Fresh water** 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? Yes

Is the engine of crosshead or trunk piston type? **Crosshead** Total internal volume of crankcase **-** No. and total area of explosion relief devices **13-6898.5 cm²**

Are flame guards or traps fitted to relief devices? **-** 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? **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? **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? No

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 **300 mm.** Centre **550 mm.** Breadth of webs at mid-throw **1180 mm.** Axial thickness of webs **335 mm.**

Side **320 mm.** Pins **Forged** Minimum **-**

If shrunk, radial thickness around eyeholes **-** Are dowel pins fitted? **-** Crankshaft material Journals **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 **SM Steel** Minimum approved tensile strength **-**

Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) **Integral with thrustshaft**



MAIN GAS TURBINES. Name and Type No.

No. of sets of turbines 1 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 _____ Mesh _____
 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 gearcast of welded construction? _____ Has the wheel/gearcase been heat treated or case hardened? _____
 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 gearbox 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 disconnected? _____ If so, what? _____

STRAIGHT SHAFTING. Diameter of thrust shaft 520 Material _____ Minimum approved tensile strength _____

Shaft separate or integral with crank or wheel shaft? _____ Diameter of intermediate shaft 440 mm. Material Steel

Minimum approved tensile strength _____ Diameter of crossshaft cou at large end 455 mm. 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 any of stern tube _____ Thickness of screw/tube shaft liner at bearings 25 mm. Thickness between bearings 20 mm. Material of screw/tube shaft Steel Minimum approved tensile strength _____

Is an approved oil gland fitted? No If so, state type _____ Length of bearing next to and supporting propeller 2495 mm.

Material of bearing Lignum Vitae 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 5400 mm. Pitch Variable Built up or solid Solid Total developed surface 103064 cm²

No. of blades 4 Blade thickness at top of vent fillet 207 mm. Blade material Bronze Moment of inertia of dry propeller 60600 Kgs/cm²

If propeller is of special design, state type _____ Is propeller of reversible pitch type? _____ Was it of approved design? _____

State method of control _____ Material of spare propeller Cast iron Moment of inertia _____

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine None Can they be furnished? _____

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of Certificate) Two: each 240 M³/Hr. capacity

driven by electric motors, both port side E.R. lower platform level, Valencia Cert. No. 5/c 687

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Two main each 12000 litres. Port side

E.R. at middle platform level Barc. Certifs. Nos. 171 & 173. Three auxiliary 250 Lts. 1 S.S. & 2 P.S. E.R. Lowest platform level Barcelona Cert. Nos. 225/6 and 7

How are receivers first charged? By main compressors receiving power from steam dynamo. Maximum working pressure of starting air system 25 Kgs/cm² Are the safety devices in 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 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 Three for main and auxy. engines.

E.R. Starboard side upper platform level. Two for Boilers in Boiler Room at after bulkhead

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) One main S.W. Circulating. One Main F.W. Circulating.

One Main Lubricating Oil. Two Bilge

INDEPENDENT PUMPS

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

Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	SUCTION										DELIVERY					
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	EMM Bilge	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling
Stand by main S.W. circ. Steam driven port side aft 320 ton/hr.		X				X					X					
Stand by main lubricating oil steam driven P.S. aft								X							X	X
Condenser circulating electric 500 tons/hr.					X				X							
Stand by main fresh water circ. steam driven S.S. aft					X						X					
Oil fuel transfer steam driven starboard side				X								X				
Bilge steam driven Starboard side 30 tons/hr.	X	X				X							X			
General service steam driven Stbd. side						X										
Two boiler circulating electric P.S. middle platform										X						
2 boiler feed 1 in Boiler 1 in E.R. S.S. aft								X		X						
3 auxiliary circ. pump electric																
O.F. daily service electric								X								
2 fuel valve cooling E.R. Starboard side Elec.																
Steam driven Butterworth Tank cleaning S.S. aft 100 tons per hour	X					X										

Boiler circulating i.e. suction from WT Boiler discharge through drums/exhaust gas econ. back to drums.

F.W. cooling auxiliary engines

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room _____ Three 80 mm. in main pump room. One 80 mm. in after
 Cofferdam. Two 65 mm. in forward hold. One 65 mm. in forward pump room. One 65 mm. in forward Cofferdam.
 No. and size connected to main bilge line in main engine room _____ Two 90 mm. One 80 mm. One 100 mm. In tunnel No tunnel
 In aux. engine room No Auxiliary Engine Room Size and position of direct bilge suction in machinery spaces One 100 mm. S.S.
 Aft One 250 mm. P.S. Size and position of emergency bilge suction in machinery spaces One 250 mm. Starboard side aft
 Is the bilge or ballast system fitted with means for separating oil water or oil and water from the discharge side? No Do the bilge and ballast systems comply with the Rules including special requirements for ships carrying petroleum in bulk, except for cargo tanks for oil tankers? (Strike out words not applicable.) Yes

STEAM & OIL ENGINE AUXILIARIES

Position of engine	Type	Machinery	Port and No. of Rev. or Cert.	Driven Machinery (For electric generator, shaft output)
Port side forward	ELCANO-GOTAVERKEN	EMPRESA		Electric Generator
E.R. inboard	DM 300/450G3	NACIONAL		125 K.W.
Port side forward	4 stroke	"ELCANO"	VALENCIA	Electric Generator
E.R. outboard	Diesels		REPORT N ^o 869	125 K.W.
Starboard side				Electric Generator
E.R. forward				125 K.W.
Port side E.R.	Allen Type Compound	S.E. de C.N.	BILBAO	Electric Generator
Midlength	Steam Engine	SESTAO	12512	75 K.W.

Is electric current used for essential services at sea? Yes If so, state the maximum No. and capacity of generators required to order that the ship may operate at sea One at 125 K.W. Is an electric generator driven by Main Engine? No

STEAM INSTALLATION. No. of dry type boilers installed Two w.p. 14 Kgs/cm² Type Mercier type CN. Water tube
 Position In separate Boiler Room after end of Engine Room at middle platform level

Is a superheater fitted? No Are these boilers also heated by exhaust gas? No No. of dry type boilers heated by exhaust gas only? One w.p. 12 Kgs/cm²
 Type LAMONT Position in E.R. at base of funnel Can the exhaust heated boilers deliver steam directly to the steam engine or do they operate only on economisers in conjunction with oil fuel boilers? Economiser Port and No. of report on boiler
W.T. Cadiz No 2783
Exhaust Gas Madrid No B18 Is steam suitable for operation of the ship at sea? Yes Are any steam pipes over 3 ins. bore? Yes If so, what is their material? Steel & Copper Are all steel boilers in the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes No. of off bearing pressure
None No. of steam condensers One No. of evaporators One

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) Electro-Hydraulic Hele Shaw type
Two pumps each driven by its own electric motor

Have the Rule Requirements for the extinguishing arrangements been complied with? Yes Brief description of arrangements CO2 & Steam Smothering in Machinery, Boiler, Pump Room and cargo spaces, fire main with hydrants, hoses and nozzles
Portable froth extinguishers throughout vessel as per Rules Requirements.

Has the space 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 test of main engine 7-2-59. 6 hours 13-2-59 6 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).



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 of this vessel has been installed under Special Survey in accordance with the Rules, approved plans and Secretary's Letters.

The material and workmanship are good. On completion main and auxiliary machinery examined under working conditions alongside and at sea with satisfactory results.

In my opinion the Machinery is eligible for Classification with this Society with records of +LMC. 2-59, D.B. (W.T.) 2-59, T.S. C.L. (Date with-held) and notation OIL ENGINE, subject to the tailshaft liner being specially examined and dealt with as necessary before the end of January, 1960.

Stephenson

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

CRANKSHAFT OR ROTORSHAFT

FLYWHEEL SHAFT

THRUSTSHAFT

GEARING

INTERMEDIATE SHAFTS Lloyd's Val. No 759 30-10-58 J.F.C.

SCREW ~~AND TUBE~~ SHAFTS Working Lloyd's Bbo. No 8915 20-6-58 J.M.R. *Spave 8285*

PROPELLERS Working Bronze Lloyd's Bbo. No 7631 FL 17-4-58 T.M. 13-11-58

OTHER IMPORTANT ITEMS

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

Date of approval of plans for crankshaft Straight shafting *16-5-57* Gearing **None** Clutch **None**

Separate oil fuel tanks *3-9-57* Pumping arrangements *17-12-58* Oil fuel arrangements *9-1-59*

Cargo oil pumping arrangements *3-9-57* Air receivers Donkey boilers *20-8-57*

Dates of examination of principal parts:-

Fitting of stern tube *7-10-57* Fitting of propeller *8-1-59* Completion of sea connections *7-10-57* Alignment of crank shaft in main bearings

Engine checks & bolts *17-12-58* Alignment of gearing **-** Alignment of straight shafting *22-10-58* Testing of pumping arrangements *15-1-*

Oil fuel lines *15-1-59* Donkey boiler supports *22-10-58* Steering machinery *7-2-59* Windlass *7-2-59*

Date of Committee **FRIDAY 17 APR 1959** Special Survey Fee *37175 pts*

Decision *See Rpt 1.*

Expenses

1800 pts

Date when A/c rendered *25-3-59*



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