

Rpt. 4b

Date of writing report 27.9.56 Received London 5-OCT 1956 Port TRIESTE No. 14470
Survey held at Trieste In shops 30 First date 16.9.1955 Last date 9.9.1956

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 90121 Name "CAPO FARO" Gross tons 1914
Owners Gestione Esercizio Navi Managers - Port of Registry Palermo
Hull built at Trieste By Cantiere Navale Giuliano San Giusto Yard No. 45 Year Month 1956-8
Main Engines made at Turin By S.A. FIAT S.G.M. Eng. No. 4025 When 1955
Gearing made at - By -
Donkey boilers made at Verona By F.A.T.I.S. Blr. Nos. 601 When 1956
Machinery installed at Trieste By Cantiere Navale Giuliano - San Giusto When 1956

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? no
Is refrigerating machinery fitted? no (See letter) If so, is it for cargo purposes? - Type of refrigerant Refrig. Machy. removed from vessel prior to vessel leaving.

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 FIAT 2 SC SA direct drive to screw
MAIN RECIPROCATING ENGINES. Licence Name and Type No. FIAT type A.486.T
No. of cylinders per engine 6 Dia. of cylinders 480 mm stroke 640 mm 2 or 4 stroke cycle 2 Single or double acting single
Maximum approved BHP per engine 2000 at 260 RPM of engine and 260 RPM of propeller.
Corresponding MIP 6.11 kg/cm2 (For DA engines give MIP top & bottom) Maximum cylinder pressure 60 kg/cm2 Machinery numeral 400
Are the cylinders arranged in Vee or other special formation? no Single line ahead If so, number of crankshafts per engine one

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 of the cylinders? yes No. and type of mechanically driven scavenge pumps or blowers per engine and how driven One. 2 pistons in tandem,, driven by M.E. crankshaft
No. of exhaust gas driven scavenge blowers per engine none 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 0.148 kg/cm2 Are scavenge manifold explosion relief valves fitted? -

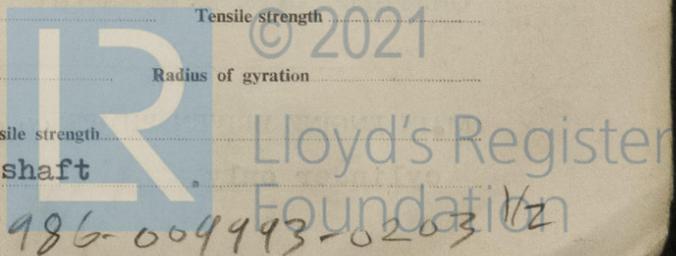
FOUR STROKE ENGINES. Is the engine supercharged? - Are the undersides of the pistons arranged as supercharge pumps? - No. of exhaust gas driven blowers per engine -
No. of supercharge air coolers per engine - Supercharge air pressure - Can engine operate without supercharger? -

TWO & FOUR STROKE ENGINES--GENERAL. No. of valves per cylinder: Fuel 1 Inlet Exhaust 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 fresh water Pistons lub.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 type? yes Total internal volume of crankcase 520 cub.ft No. and total area of explosion relief devices 6-322 sq.in. Are flame guards or traps fitted to relief devices? no 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? 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? See Genoa Rpt. 4b 21282

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 9.11.55 State barred speed range(s), if imposed for working propeller 60 to 80 R.P.M. For spare propeller 56/76 RPM Is a governor fitted? yes Is a torsional vibration damper or detuner fitted to the shafting? no
Where positioned? - Type - No. of main bearings 7 Are main bearings of ball or roller type? no Distance between inner edges of bearings in way of crank(s) 590 mm Distance between centre lines of side cranks or eccentrics of opposed piston engines -

Crankshaft type: Built, semi-built, solid. (State which) solid forged
Diameter of journals 350 mm Diameter of crankpins Centre 350 mm Side - Breadth of webs at mid-throw 520 mm Axial thickness of webs 172 mm
If shrunk, radial thickness around eyeholes - Are dowel pins fitted? - Crankshaft material Journals S.M.S. Minimum Approved Genoa Rpt. 21282
Diameter of flywheel 1659 mm Weight 760 kg. Are balance weights fitted? no Total weight - Radius of gyration -

Diameter of flywheel shaft - Material - Minimum approved tensile strength -
Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with thrustshaft



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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 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 $\sqrt{350}$ mm Material E.F.S. Minimum approved tensile strength Gen.Cert.2244

Shaft separate or integral with crank or wheel shaft? separate Diameter of intermediate shaft $\sqrt{195}$ mm Material E.F.S.

Minimum approved tensile strength 46.8 kg/mm^2 Diameter of screwshaft cone at large end $\sqrt{220}$ 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 way of stern tube Thickness of screwshaft liner at bearings 15 mm Thickness between bearings 13 mm Material of screwshaft E.F.S. Minimum approved tensile strength 48.4 kg/mm^2

Is an approved oil gland fitted? no If so, state type Length of bearing next to and supporting propeller $\sqrt{880}$ 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 $\sqrt{2500}$ mm Pitch $\sqrt{1920}$ mm Built up or solid solid Total developed surface 2.46 Mt^2

No. of blades 4 Blade thickness at top of root fillet 109 mm Blade material M.Bronze Moment of inertia of dry propeller 1518 kg/M^2

If propeller is of special design, state type standard Is propeller of reversible pitch type? no If so, is it of approved design?

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

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine none Can they be declutched?

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) 1 at 50 Mt³/hr. Electrically driven

1 at 50 Mt³/hr driven by 36 BHP generator set. (Through Clutch). 1 hand compressor. (s.s. fw

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 2 at 2.5 Mt³/hr. 1 at 2.7 Mt³/hr.

(1 portside & 2 stbd.side) Genoa Rpt. 21282 1 air bottle (200 lt. s.s.) Gen.Cert.A/6

How are receivers first charged? By compressor on generator set Maximum working pressure of starting air system 30 kg/cm^2 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 2

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) One scavenge air pump and one fuel injection pump to each cylinder only.

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	Ballast or Overboard
All electrically driven																
2 I.O. pumps. Stbd. side								X							X	
1 M.E. S.W. cooling s.s.						X				X						
1 M.E. S.W. or F.W. s.s.		X			X	X				X	X					
1 M.E. F.W. cooling s.s.					X					X						
2 Bilge/ballast 47T/h.fwd.	X	X				X							X			X
2 Gky. Blr. feed pumps p.s.							X			X						
1 Eng. Fire pump						X								X		
1 F.O. Transfer pump.					X							X				
1 F.O. to M.E. or Transfer					X							X				Main Eng.
1 F.O. to M.E.					X							X				Main Eng.

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room Holds N°s. 1, 4 & 5: Two at 60 mm.

Holds N°s. 2 & 3: Two at 70 mm.

No. and size connected to main bilge line in main engine room 3 at 60 mm. 2 at 50 mm. from C.D's In tunnel 1 at 60 mm

Size and position of direct bilge suction in machinery spaces 2 at 95 mm.

one portside, one starboardside and position of emergency bilge suction in machinery spaces 1 at 125 mm starbd. side

Is the 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 XXXXX

~~XXXXX~~ (strike out words not applicable). yes

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery <small>(For electric generators, state output)</small>
Portside fwd.	Oil engine	Nuova San	Genoa 4c. 21488	Generator 80 Kwts.
Portside aft	4 SC SA	Giorgio S.A.	do	do
Starboard side fwd.	type 6 SR 19	do	do	do
Starboard side aft	type 3 SR 14	do	do 21489	Generator 24 Kwts. and air compressor through clutch.

Is electric current used for essential services at sea? yes If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea 1 at 80 Kwt. Is an electric generator driven by Main Engine? no

STEAM INSTALLATION. No. of donkey boilers burning oil fuel 1 W.P. 3.5 kg/cm^2 Type Cyl. vert. tubular boiler (Design N° 593)

Position starting platform level portside forward

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

For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? yes No. of oil burning pressure units gravity No. of steam condensers No. of Evaporators

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) Electric hydraulic system - 2 pumps - 2 elec. motors - 2 hydraulic cylinders.

Have the Rule Requirements for fire extinguishing arrangements been complied with? yes Brief description of arrangements CO2 system for holds and Eng. room Portable extinguishers, water hoses, sand.

Has the spare 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 sea trials of main engines 21.7.56 2 hrs. - 30.7.56 6hrs. Does this machinery installation contain any features of a novel or experimental nature? (Give particulars)

None

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).

004986-004993-020322



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 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 main machinery of this vessel and the four auxiliary generator sets have been constructed under special survey under the supervision of the Genoa Surveyors. See Genoa Rpt. N° 21282 and Rpt. (4c) N°s. 21488 & 21489. This machinery has been installed aboard the above vessel in an efficient manner and in accordance with the Society's Rules, the Secretary's letters and approved plans. The workmanship and materials are good. On completion the machinery has been tried at sea under full load conditions and found satisfactory. The Donkey boiler, for non-essential purposes, was not constructed under the Society's Surveyors supervision. See Trieste letter 19.7.56 and Secretary's reply 'ENG.' dated 24.7.56. This boiler has been hydraulically tested to twice the W.P., fitted with a safety valve of approved design and examined under steam when the safety valves were adjusted to 3.5 kg/cm². It was stated that a boiler of approved design, built under the Society's Surveyors supervision would be fitted aboard the vessel in about six months time.. The machinery reported above, in our opinion, is suitable for a classed ship and eligible to receive the notations:- +LMC - 8,56 Oil Engine ^{DB 50 lbs. - subject to the donkey boiler being replaced before the end of February, 1957} one of approved design and built under the supervision of the Society's Surveyors. The main machinery is not to be operated continuously between 60 and 80 R.P.M.

J. Wilson for S.W. Skinner, S. Verdarelli and self.
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 ~~See Genoa Report 4b N° 21282~~ See Genoa Report 4b N° 21282

~~INTERMEDIATE SHAFTS~~

THRUSTSHAFT

-do-

~~SCREWS~~

INTERMEDIATE SHAFTS N°s. 2357/8/9 and 2360 Naples Cert. N° 1758/a/b

SCREW ~~SHAFTS~~ N° 2356 Naples Cert. N° 1758

PROPELLERS N° 238 Trieste Cert. N° 3265
3280

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 **Genoa** Straight shafting **Genoa** Gearing Clutch

Separate oil fuel tanks **21.12.55 approved for Yard N° 44** Pumping arrangements **26.1.56 9.7.56** Oil fuel arrangements **9.7.56**

Cargo oil pumping arrangements Air receivers **See Gen. Rpt. 4b** Donkey boilers **See correspondence**

Dates of examination of principal parts:-

Fitting of stern tube **6.3.56** Fitting of propeller **9.3.56** Completion of sea connections **9.3.56** Alignment of crank shaft in main bearings **20.6.56**

Engine chocks & bolts **20.6.56** Alignment of gearing Alignment of straight shafting **20.6.56** Testing of pumping arrangements **30.7.56**

Oil fuel lines **30.7.56** Donkey boiler supports **10.7.56** Steering machinery **21.7.56** Windlass **21.7.56**

Date of Committee **FRIDAY 23 NOV 1956**

Decision **+LMC 9.56 Subject.**
(With Tors. End.)

DUAL CLASS
L.R. & F.I.

Installation **£ 210,000.-**
Special Survey Fee **£ 178,500.-**
Less 15% = **£ 4,450.-**
2 1/2 % Car fund **4,500.-**
Expenses **5625.-**
Per Tax 3%

Date when A/c rendered **24/9/56**
Lloyd's Register Foundation