

Report on Steam Turbine Machinery.

No. 5217

21 AUG 1954

Date of writing Report 8th JULY 1954 When handed in at Local Office 1954 Port of NAPLES (PALERMO)
 No. in Survey held at PALERMO Date, First Survey 26th Aug 1953 Last Survey 22nd May 1954
 Reg. Book 56570 on the SS. "CONCA D'ORO" (Number of Visits 56) Tons (Gross 12869.38 Net 7679.90)
 Built at PALERMO By whom built CANTIERI NAVALI RIUNITI Yard No. 203 When built 1954
 Engines made at RIVA TRIGOSO By whom made CANTIERI DEL TIRRENO Engine No. 4078/B When made 1954
 Boilers made at PALERMO By whom made CANTIERI NAVALI RIUNITI Boiler No. 1953-54 When made 1953-54
 Shaft Horse Power at Full Power 11,000 Owners SOC' DI NAV' PER AZIONI "LA SICILIA" Port belonging to PALERMO
 Nom. Horse Power as per Rule 2,000 Is Refrigerating Machinery fitted for cargo purposes NO Is Electric Light fitted YES
 Trade for which Vessel is intended CARRYING PETROLEUM IN BULK

STEAM TURBINE ENGINES, &c.—Description of Engines ONE SET OF TWO STEAM TURBINES DIRECT COUPLED TO D.R. GEARING TO ONE PROPELLER SHAFT
 No. of Turbines Ahead TWO Direct coupled, single reduction geared to ONE propelling shaft. No. of primary pinions to each set of reduction gearing TWO
 No. of Turbines Astern ONE Direct coupled, double reduction geared
 direct coupled to Alternating Current Generator — phase — periods per second — raled — Kilowatts — Volts at — revolutions per minute;
 for supplying power for driving — Propelling Motors, Type —
 rated — Kilowatts — Volts at — revolutions per minute. Direct coupled, single or double reduction geared to — propelling shafts.

TURBINE BLADING.	H. P.	I. P.	L. P.	ASTERN.
NO OF WHEELS.	1 + 9	—	7	1 + 1
impulse Blading	2 - 1 IN EACH WHEEL	—	1 IN EACH WHEEL.	2 - 1 IN EACH WHEEL.
No. of rows	—	—	—	—
Reaction Blading	—	—	—	—
No. of rows in each stage	—	—	—	—

Shaft Horse Power at each turbine H.P. 5150 ✓ I.P. — L.P. 4850 ✓
 Revolutions per minute, at full power, of each Turbine Shaft H.P. 4526 ✓ I.P. — L.P. 3645 ✓
 Rotor Shaft diameter at journals H.P. 125 $\frac{1}{4}$ in ✓ I.P. — L.P. 125 $\frac{1}{4}$ in ✓
 Pitch Circle Diameter 1st pinion HP 226.4 $\frac{1}{4}$ in ✓ 1st reduction wheel LP 276.3 $\frac{1}{4}$ in ✓
 2nd pinion HP 466.6 $\frac{1}{4}$ in ✓ main wheel 3101.3 $\frac{1}{4}$ in ✓ Face
 Distance between centres of pinion and wheel faces and the centre of the adjacent bearings 1st pinion HP 383.5 $\frac{1}{4}$ in ✓ 1st reduction wheel HP 463.5 $\frac{1}{4}$ in ✓
 2nd pinion HP 680 $\frac{1}{4}$ in ✓ main wheel 720 $\frac{1}{4}$ in ✓

QUILL Flexible Pinion Shafts, diameter at bearings 1st HP 157 $\frac{1}{4}$ in ✓ 2nd LP 228 $\frac{1}{4}$ in ✓
 Pinion Shafts, diameter at bearings External HP-LP 180 $\frac{1}{4}$ in ✓ H.P.L.P. 350 $\frac{1}{4}$ in ✓
 Internal 1st REDUCED TO 130 $\frac{1}{4}$ in ✓ 2nd 230 $\frac{1}{4}$ in ✓ diameter at bottom of pinion teeth
 Wheel Shafts, diameter at bearings 1st HP 225 $\frac{1}{4}$ in ✓ diameter at wheel shroud, main 528 $\frac{1}{4}$ in ✓ reduced to 495 $\frac{1}{4}$ in ✓ at journals
 Intermediate Shafts, diameter as per rule as approved as fitted 487 $\frac{1}{4}$ in ✓
 Thrust Shaft, diameter at collars as per rule as approved as fitted 400 $\frac{1}{4}$ in ✓ reduced to 300 $\frac{1}{4}$ in ✓
 Tube Shaft, diameter as per rule as approved as fitted 530-487 $\frac{1}{4}$ in ✓ Is the tube screw shaft fitted with a continuous liner Yes ✓
 Screw Shaft, diameter as per rule as approved as fitted 530-487 $\frac{1}{4}$ in ✓ Is the after end of the liner made watertight in the propeller boss Yes ✓
 Thickness between bushes as per rule as approved as fitted 25 $\frac{1}{4}$ in ✓ Thickness between bushes as per rule as approved as fitted 17.5 $\frac{1}{4}$ in ✓

If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner Yes ✓
 If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive Yes ✓
 If two liners are fitted, is the shaft lapped or protected between the liners — Is an approved Oil Gland or other appliance fitted at the after end of the tube shaft NO If so, state type —
 Propeller, diameter 6.30 H.E.V Pitch 5.7 H.E No. of Bades 4 State whether Moveable NO Total Developed Surface 1339 square feet
 If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Yes ✓ Can the H.P. — Turbines exhaust direct to the Condenser Yes ✓
 No. of Turbines fitted with astern wheels One Feed Pumps No. and size 2 59.2 m³/hr 1 31.6 m³/hr.
 How driven Steam turbines, Electric Motor

Pumps connected to the Main Bilge Line No. and size 2 80 kts/hr 1 30 tons/hr Lubricating Oil Pumps, including Spare Pump, No. and size 1 60 m³/hr 1 80 m³/hr
 Are two independent means arranged for circulating water through the Oil Cooler Yes ✓ Suctions, connected both to Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Engine and Boiler Room 3 125 $\frac{1}{4}$ in 1 70 $\frac{1}{4}$ in 50 80 mm added & fitted In Pump Room AG 168 $\frac{1}{4}$ in FORD 1-70 $\frac{1}{4}$ in P.S.
 In Holds, &c. FORD HOLD 1-P.S 70 $\frac{1}{4}$ in CHAIN LOCKER 1-70 $\frac{1}{4}$ in FORD STORE 1-70 $\frac{1}{4}$ in AFT COFFIN 1-P.S-68 $\frac{1}{4}$ in FORD COFFIN 1-70 $\frac{1}{4}$ in P.S. 1

Main Water Circulating Pump Direct Bilge Suctions, No. and size 1-400 $\frac{1}{4}$ in Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 2-125 $\frac{1}{4}$ in 1-70 $\frac{1}{4}$ in ✓ Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Yes ✓
 Are the Bilge Suctions in the Machinery Space led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges Yes ✓
 Are all Sea Connections fitted direct on the skin of the ship Steel boxes ✓ Are they fitted with Valves or Cocks both ✓
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates Yes ✓ Are the Overboard Discharges above or below the deep water line both ✓ Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Yes ✓ Are the Blow Off Cocks fitted with a spigot and brass covering plate Yes ✓ What pipes pass through the bunkers Four lead ballast suction ✓ How are they protected heavy gauge st. pipe ✓
 What pipes pass through the deep tanks F.P. suction ✓ Have they been tested as per rule Yes ✓
 Are all Pipes, Cocks, Valves and Pumps in connection with the machinery and all boiler mountings accessible at all times Yes ✓
 Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery spaces, or from one compartment to another Yes ✓ Is the Shaft Tunnel watertight — Is it fitted with a watertight door — worked from —

BOILERS, &c.—(Letter for record —) Total Heating Surface of Boilers 2 @ 10,540 sq ft. Total 21,080 sq ft.
 Is Forced Draft fitted Yes No. and Description of Boilers Two D' type Foster Wheeler Working Pressure 675 lb/sq in Super 110
 Is a Report on Main Boilers now forwarded? Yes

Is a Donkey Boiler fitted? NO (Steam generator fitted) If so, is a report now forwarded? —
 (an Auxiliary)
 Is the donkey boiler intended to be used for domestic purposes only? —
 Plans. Are approved plans forwarded herewith for Shafting (12-8-52 22-11-53) Main Boilers 21-4-52 Auxiliary Boilers — Donkey Boilers —
 (If not, state date of approval) (22-12-53)
 Superheaters 21-4-52 General Pumping Arrangements 22-10-52 Oil Fuel Burning Arrangements 21-1-53
 Geared turbines situated aft. Have torsional vibration characteristics of system been approved. Yes ✓ Date of approval 5-1-54

SPARE GEAR.

Has the spare gear required by the Rules been supplied. Yes
 State the principal additional spare gear supplied. One propeller shaft complete, one propeller, one set bearings for HP+LP turbines and thrust pads. One set bearings for reduction gears; 10% tubes for condensers, heaters, and coolers; impellers, shafts, rings and bearings for each centrifugal pump. One set bearings for screw pumps; valves seats rings + guards for recip pumps; one set bearings and thrust pads for turbo alternators; one set valves, seats, springs, rings, top + bottom end bolts and bearing bolts fuel pump for diesel gen' engine; one set rings, valves + packing for compressors; 10% tubes for evaporators; miscellaneous electrical stores and stores for workshop.

CANTIERI NAVALI RIUNITI
 SINTERE P. ... TO MECCANO. CO. PALERMO

The foregoing is a correct description, Yes Manufacturer CANTIERI NAVALI RIUNITI

Dates of Survey while building
 During progress of work in shops - From 29-11-52 to 4/12/53 (Genoa) 26/9/53 to 13/4/54 (Palermo)
 During erection on board vessel - 26/9/53 to 22/5/54
 Total No. of visits 40 (Genoa) + 56 (Palermo)

Dates of Examination of principal parts - Casings 29/9/53, 9/10/53 Rotors 2/10/53 Blading 29/9/53 Gearing 17/11/53
 Wheel shaft 2/10/53 Thrust shaft 2/9/53 Intermediate shafts 27/1/54 Tube shaft — Screw shaft 20/1/54
 Propeller 17/11/53 Stern tube 1/10/53 Engine and boiler seatings 4/5/54 Engine holding down bolts 22/1/54
 Completion of fitting sea connections 20/2/54 Completion of pumping arrangements 28/4/54 Boilers fitted 5/6/54 Engines tried under steam 24/4/54

Main boiler safety valves adjusted 19/5/54 Thickness of adjusting washers LOCK NUTS.
 Rotor shaft, Material and tensile strength C. Mo steel U.T.S. 70/80 kgm/cm² Identification Mark Lloyds 1442/2 1579/8
 Flexible Pinion Shaft, Material and tensile strength HP N. Mo steel U.T.S. 70 kgm/cm² Identification Mark Lloyds 55 3115-3183 C
 Pinion shaft, Material and tensile strength LP C steel U.T.S. 50-60 kgm/cm² Identification Mark Lloyds 1440/2 1441/7
 Chemical analysis C 0.31 Si 0.29 S 0.008 P 0.017 Mn 0.66 C 0.62 Ni 2.87 Mo 0.37

If Pinion Shafts are made of special steel state date of approval of chemical analysis, physical properties and heat treatment Yes 21/1/53.

1st Reduction Wheel Shaft, Material and tensile strength See flexible pinion shafts Identification Mark —
 Wheel shaft, Material See U.T.S. 50/60 kgm/cm² Identification Mark Lloyds 1436/2 G Thrust shaft, Material See U.T.S. 50/60 kgm/cm² Identification Mark Lloyds 1456/2 G
 Intermediate shafts, Material See U.T.S. 50/60 kgm/cm² Identification Marks Lloyds 1894 DC Tube shaft, Material — Identification Marks —
 Screw shaft, Material See U.T.S. 50/60 kgm/cm² Identification Marks Lloyds 1905/2 DC Steam Pipes, Material Carbon steel + C. Mo steel Test pressure 90 kgm/cm²

Date of test 3/4/54 and subsequently. Is an installation fitted for burning oil fuel Yes ✓
 Is the flash point of the oil to be used over 150°F Yes ✓ Have the requirements of the Rules for the use of oil as fuel been complied with Yes ✓

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo — If so, have the requirements of the Rules been complied with —
 If the notation for ice strengthening is desired, state whether the requirements in this respect have been complied with —

Is this machinery a duplicate of a previous case Yes If so, state name of vessel "Giorgio Fassio" + Anema CNR 236

General Remarks. (State quality of workmanship, opinions as to class, etc.) The steam turbine and reduction gearing have been constructed under Special Survey of tested materials and in accordance with the approved plans, Secretary's letters and Rule requirements. The material and workmanship are good. The parts are now being dispatched to Palermo to be fitted on board by Messrs C.N.R. yard No 203. When the machinery of this vessel has been installed and tried at full power to the satisfaction of the Palermo Surveyor, the gear case and turbine casings specially examined on completion of full power trials and found sound and free from defects, the vessel will be eligible to be classed in the Secretary's Register Book with the notation +LMC (with date) "STEAM TURBINES DR. GEARED TO PROPELLER SHAFT." N.B. The gearing requires to be specially examined and reported upon after a period not exceeding 12 months in service. (See Genoa R/S No 19852)

The machinery of this vessel has been constructed of tested materials under Special Survey in accordance with the Rule requirements, approved plans & Secretary's letters. The workmanship is good. The machinery has been efficiently installed (see following)

The amount of Entry Fee	<u>L. 850 : 935</u>	When applied for	<u>19</u>
Special	<u>£</u>	When received	<u>19</u>
Donkey Boiler Fee	<u>£ 296 804</u>		
Travelling Expenses (if any)	<u>£ 295 000</u>		

Signature: [Signature] Engineer Surveyor to Lloyd's Register of Shipping.
 Date: 17 SEP 1954

Assigned +LMC 5.54 - Subject. (With Torsional Ord.)
2 WTB 675 lb.
Ch.

on board the vessel, tried under full power conditions and found satisfactory

The torsional vibrations characteristics have been approved for a service speed of 98 R.P.M.

Turbine casings, gears and gear casing examined after trials and found satisfactory
 N.B. Screw shafts not to be run continuously between 65 + 75 R.P.M.

The machinery of this vessel is eligible in our opinion to be classed +LMC 5.54 "Two steam turbines D.R. geared to one screw shaft" and notation T.S.C.L. "Fitted for O.F. 5.54, F.P. above 150°F."
 Signature: [Signature]

Certificate required to be sent to

The Surveyors are requested not to write on or below the space for Committee's Minute.

