

Report on Steam Turbine Machinery. No. 12356

4 JAN 1960

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 Date, First Survey 17.10.57. Last Survey 20.11.1959.
 Survey held at Stockholm. (Number of Visits 25)

on the Single Twin Triple Quadruple Screw Vessel Tons (Gross) (Net)
 at Rijeka By whom built Brodogradiliste, 3 Maj Yard No. 460 When built
 nes made at Stockholm By whom made A/B de Laval's Ångturbin Engine No. 45053 When made 1959
 rs made at By whom made Boiler No. When made
 t Horse Power Maximum 13750 Owners Port belonging to
 as per Rule Service 12500 2750 Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted Yes
 le for which Vessel is intended

STEAM TURBINE ENGINES, &c.—Description of Engines Impulse Turbines for Main Propelling Machinery
 of Turbines Ahead 2.HP & LP Direct coupled, single reduction geared to 1 propelling shafts. No. of primary pinions to each set of reduction gearing 2
 Astern 1.LP double reduction geared
 ect coupled to Alternating Current Generator phase periods per second rated Kilowatts Volts at revolutions per minute;
 Direct Current Generator
 supplying power for driving Propelling Motors, Type Direct coupled, single or double reduction geared to propelling shafts.
 ed Kilowatts Volts at revolutions per minute.

TURBINE	H. P.	I. P.	L. P.	ASTERN.
LOADING.				
No. of rows	9		8	3
No. of stages				
No. of rows in each stage				

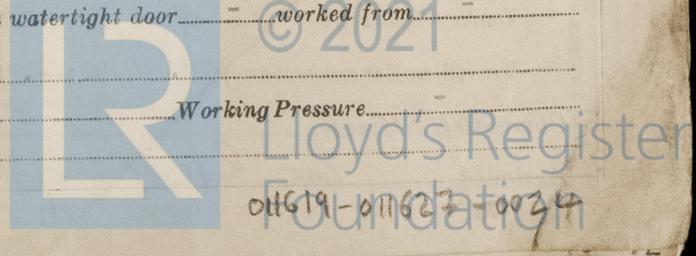
ft Horse Power at each turbine H.P. 6875 I.P. - L.P. 6875
 Revolutions per minute, at full power, of each Turbine Shaft
 HP = 279.567 mm. HP=1815.215 mm.
 Motor Shaft diameter at journals H.P. 149.75 mm. I.P. - L.P. 149.75 mm.
 Pitch Circle Diameter 1st pinion LP = 350.443 mm. 1st reduction wheel LP=1744.338 mm.
 2nd pinion HP & LP 522.628 mm. main wheel 3351.854 mm.
 Width of Face 1st reduction wheel HP & LP 560 mm.
 main wheel 1045 mm.
 1st reduction wheel 405 mm.
 main wheel 792.5 mm.

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings
 1st 199.6 mm. 2nd 449.4 mm. HP 1st 269.767 mm
 2nd 300 mm. LP 2nd 340.643 mm
 Pinion Shafts, diameter at bearings External Internal
 1st 325 mm. Generator Shaft, diameter at bearings
 main 680 mm. Propelling Motor Shaft, diameter at bearings
 as per rule 560 mm.
 Thrust Shaft, diameter at collars as fitted 560 mm. 530 ad coupling
 as fitted 540 mm. between journals
 Is the tube shaft fitted with a continuous liner
 Is the screw

ronze Liners, thickness in way of bushes as per rule Thickness between bushes as fitted Is the after end of the liner made watertight in the
 propeller boss If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner
 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
 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 If so, state type Length of Bearing in Stern Bush next to and supporting propeller
 propeller, diameter Pitch No. of Blades State whether Moveable Total Developed Surface square feet.
 Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Yes Can the H.P. or I.P. Turbines exhaust direct to the
 condenser No No. of Turbines fitted with astern wheels 1 (LP) Feed Pumps No. and size How driven

pumps connected to the Main Bilge Line No. and size How driven 1 direct driven from gear 450 lit/min.
 ballast Pumps, No. and size Lubricating Oil Pumps, including Spare Pump, No. and size Branch Bilge Suctions, No. and size:—In Engine
 are two independent means arranged for circulating water through the Oil Cooler In Pump Boom
 and Boiler Rooms
 n Holds, &c. Direct Bilge Suctions to the Engine and/or Boiler Room
 Main Water Circulating Pump Direct Bilge Suctions, No. and size
 Bilges, No. and size Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes
 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.
 Are all Sea Connections fitted direct on the skin of the ship Are they fitted with Valves or Cocks
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates Are the Overboard Discharges above or below the deep water
 Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Are the Blow Off Cocks fitted with a spigot and brass
 How are they protected
 covering plate What pipes pass through the bunkers Have they been tested as per rule
 What pipes pass through the deep tanks Are all Pipes, Cocks, Valves and Pumps in connection with the machinery and all boiler mountings accessible at all times
 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
 Is the Shaft Tunnel watertight Is it fitted with a watertight door worked from

BOILERS, &c.—Total Heating Surface of Boilers Working Pressure
 s Forced Draught fitted No. and Description of Boilers
 s a Report on Main Boilers now forwarded?



Is ^{a Donkey} _{an Auxiliary} Boiler fitted? If so, is a report now forwarded?

Is the donkey boiler intended to be used for domestic purposes only?

Plans. Are approved plans forwarded herewith for Shafting ^{Turbines} & 27.11.57 Main Boilers Auxiliary Boilers Donkey Boilers
(If not, state date of approval) ^{Gearing}

Superheaters General Pumping Arrangements Oil Fuel Burning Arrangements

Geared turbines ^{situated aft.} } Have torsional vibration characteristics of system been approved. Yes Date of approval 19th June 1958

SPARE GEAR. "For a service speed of 112 RPM"

Has the spare gear required by the Rules been supplied?

State the principal additional spare gear supplied.

The foregoing is a correct description.

TURBIN AB DE LAVAL LJUNGSTRÖM
Technical Section
Berkel Jang

Dates of Survey while building	During progress of work in shops - -	17.10.57 T.	20.11.59.
	During erection on board vessel - -	-	-
Total No. of visits		25	
Dates of Examination of principal parts—	Casings	HP 20/26.9.58. LP 1.10.58.	HP 25.10.57 LP 8.4.58
	Rotors	LP 10/15/23.1.59.	Blading LP 6.3.59. Gearing 23.1.59/12
Wheel shaft	17.3.58.	Thrust shaft 9.3.59.	Intermediate shafts - 27.11.58
Propeller	-	Stern tube -	Engine and boiler seatings - Engine holding down bolts -
Completion of fitting sea connections	-	Completion of pumping arrangements -	Boilers fixed - Engines tried under steam 24.9.58
Main boiler safety valves adjusted	-	Thickness of adjusting washers -	
Rotor shaft, Material and tensile strength	Electro Steel HP and LP 66.3 - 66.9 kg/mm ²	Identification Mark	HP-1449 SKM WL LP-5582 SKM WAC
Flexible Pinion Shaft, Material and tensile strength	Electro Steel 64.3 - 69.5 kg/mm ²	Identification Mark	HP-1864 SKM KE LP-1581 GOT WAC
Pinion shaft, Material and tensile strength	Electro Steel HP & LP 1st Red. 83.8-90.3, 2nd Red. 82.5-87.7 kg/mm ²	Identification Mark	HP-1865/1582 GOT LP-1st 4771 GOT LP-1st 4774 GOT
HP 2nd 1526 GOT AR 16.12.58 LP 2nd 1524 GOT AR 16.12.58 ; Chemical analysis -			

If Pinion Shafts are made of special steel state date of approval of chemical analyses, physical properties and heat treatment 20th Nov. 1957.

1st Reduction Wheel Shaft, Material and tensile strength Electro Steel 67.0 - 69.2 kg/mm² Identification Mark HP-1496 GOT WAC LP-2071 GOT WAC 1567 GOT WAC 4763 SKM

Wheel shaft, Material Electro Steel Identification Mark 17.3.58. Thrust shaft, Material Electro Steel Identification Mark 9.3.59.

Intermediate shafts, Material - Identification Marks - Tube shaft, Material - Identification Marks -

Screw shaft, Material - Identification Marks - Steam Pipes, Material - Test pressure -

Date of test - Is an installation fitted for burning oil fuel?

Is the flash point of the oil to be used over 150°F. - Have the requirements of the Rules for the use of oil as fuel been complied with?

Full description of Fire Extinguishing Apparatus fitted in machinery spaces. -

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 Brodogradiliste Yard 459

General Remarks. (State quality of workmanship, opinions as to class, &c.) This machinery has been built under Special Survey and accordance with the approved plans, Secretary's letters and the Requirements of the Rules so far as applicable. The materials used in the construction have been tested and approved by the Society's Surveyors and the certificates are forwarded with this report. The completely assembled machinery has been tried under steam, when coupled to a water brake absorbing 3000 HP, at the Engine Builders Works. The governor, emergency overspeed governor, hand and automatic steam shut off arrangements in connection with the lubricating oil system functioned satisfactorily when tried under working conditions. On completion of the shop trials the surface of all journals and bearings and the bedding in of gears were examined and approved. Wear down and alignment gauges adjusted and marked accordingly. This machinery is eligible in our opinion to have the notation of +LMC (with date) when securely fitted onboard the vessel under the supervision and to the satisfaction of the Society's Surveyors and to the bedding in of the reduction gearing being again examined after full power sea trials.

JM

The amount of Entry Fee	£r. 3.380:--	When applied for	3/12 1958
Special	£ :	When received	
Donkey Boiler Fee	£ :		
Travelling Expenses (if any)	£r. 80:--		19

H. Clugston
Engineer Surveyor to Lloyd's Register of Shipping.
 Lloyd's Register Foundation

Committee's Minute. FRIDAY 14 APR 1967

Assigned. See Rka 1093

Certificate (if required) to be sent to the Surveyors are requested not to write on or below the space for Committee's Minute. 13.2.61