

EXHAUST
REPORT ON STEAM TURBINE MACHINERY. No. 1429.Date of writing Report 20th Jan 32 When handed in at Local Office

Port of BREMEN

Received at London Office 23 JAN 1932

No. in Survey held at BREMEN

Date, First Survey 29th OCT 31 Last Survey 6th JANUARY 1932

Reg. Book.

(Number of Visits 10)

on the HARIMA KARD No 184

Built at KOBE
EXHAUST STEAM TURBINE & GEAR
Engines made at BREMEN

By whom built THE HARIMA SHIPB. & ENG. CO

Yard No. 184 When built

By whom made DEUTSCHE SCHIFFMASCH. A.G.
WERK A.G. WESER

Engine No. 27.322 When made 1932

Boilers made at EXHAUST STEAM TURBINE

By whom made

Boiler No. — When made —

Shaft Horse Power at Full Power 1330

Owners

Port belonging to

Nom. Horse Power as per Rule

Is Refrigerating Machinery fitted for cargo purposes

Is Electric Light fitted

Trade for which Vessel is intended

STEAM TURBINE ENGINES, &c.—Description of Engines EXHAUST STEAM TURBINE DOUBLE REDUCTION GEARED
SYSTEM BAUER-WACH

No. of Turbines Ahead 1 Direct coupled, single reduction geared } to 1 propelling shafts. No. of primary pinions to each set of reduction gearing 1
Astern double reduction geared } THROUGH AN OIL COUPLING

direct coupled to { Alternating Current Generator — phase — periods per second }
Direct Current Generator } rated — 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.

TURBINE BLADING.		H. P.			I. P.			L. P.			ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	
1ST EXPANSION													
2ND " 							80 ^{mm}	960 ^{mm}	1				
3RD " 							99 ^{mm}	998 ^{mm}	1				
4TH " 							118 ^{mm}	1036 ^{mm}	1				
5TH " 							137 ^{mm}	1074 ^{mm}	1				
6TH " 							157 ^{mm}	1114 ^{mm}	1				
7TH " 							184 ^{mm}	1168 ^{mm}	1				
8TH " 							210 ^{mm}	1220 ^{mm}	1				
9TH " 													
10TH " 													
11TH " 													
12TH " 													

Shaft Horse Power at each turbine { H.P. —
I.P. —
L.P. 1330 } Revolutions per minute, at full power, of each Turbine Shaft { H.P. —
I.P. —
L.P. 3300 } 1st reduction wheel 432/417
main shaft 77

Rotor Shaft diameter at journals { H.P. —
I.P. —
L.P. 170^{mm} } Pitch Circle { 1st pinion 225.537^{mm} 2nd pinion 407.35^{mm} } 1st reduction wheel 1726.05^{mm} main wheel 2209.34^{mm} } Width of Face { 1st reduction wheel 310^{mm} main wheel 640^{mm} }

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 325/285^{mm} 2nd pinion 470^{mm} } 1st reduction wheel 1765/400^{mm} main wheel 580^{mm}

Flexible Pinion Shafts, diameter { 1st — 2nd 115 } Pinion Shafts, diameter at bearings { External 1st 160^{mm} 2nd 380^{mm} } diameter at bottom of pinion teeth { 1st 214.537^{mm} 2nd 390.85^{mm} }

Wheel Shafts, diameter at bearings { 1st 280^{mm} main 540^{mm} } diameter at wheel shroud, { 1st 1660^{mm} main 2110.5^{mm} } Generator Shaft, diameter at bearings — Propelling Motor Shaft, diameter at bearings —

Intermediate Shafts, diameter as per rule — as fitted — Thrust Shaft, diameter at collars as per rule — as fitted 380^{mm} Tube Shaft, diameter as per rule — as fitted —

Screw Shaft, diameter as per rule — as fitted — Is the { tube screw } shaft fitted with a continuous liner { — } Bronze Liners, thickness in way of bushes as per rule — as fitted —

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 — 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 — 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 — 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.

If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine — Can the H.P. or I.P. Turbine exhaust direct to the

Condenser — No. of Turbines fitted with astern wheels — Feed Pumps { No. and size — How driven — }

Pumps connected to the Main Bilge Line { No. and size — How driven — }

Ballast Pumps, No. and size — Lubricating Oil Pumps, including Spare Pump, No. and size —

Are two independent means arranged for circulating water through the Oil Cooler — Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size: — In Engine and Boiler Room —

In Holds, &c. —

Main Water Circulating Pump Direct Bilge Suctions, No. and size — Independent Power Pump Direct Suctions to the Engine Room

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 line —

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 covering plate —

What pipes pass through the bunkers — How are they protected —

What pipes pass through the deep tanks — Have they been tested as per rule —

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 spaces, or from one compartment to another — Is the Shaft Tunnel watertight — Is it fitted with a watertight door —

BOILERS, &c.—(Letter for record ✓) Total Heating Surface of Boilers ✓

Is Forced Draft fitted ✓

No. and Description of Boilers ✓

Working Pressure ✓

Is a Report on Main Boilers now forwarded? ✓

Is { a Donkey } Boiler fitted? ✓
{ an Auxiliary }

If so, is a report now forwarded? ✓

Plans. Are approved plans forwarded herewith for Shafting *yes*
(If not state date of approval)

Main Boilers ✓

Auxiliary Boilers ✓

Donkey Boilers ✓

Superheaters ✓

General Pumping Arrangements ✓

Oil Fuel Burning Arrangements ✓

Spare Gear. State the articles supplied:—

*1 set of thrust pads - both for Turbine Thrust bearing
1 " " " " " Propeller " " "
1 " " " " " Pinion II " " "
1 set of bearing frames for Turbine bearings
1 " " " " " Pinion " " "
1 set of studs & nuts for all bearings*

The foregoing is a correct description,

i. v. Schuricke

Manufacturer

Dates of Survey while building { During progress of work in shops -- 1931 Oct. 29. Nov. 13. 17. 24. 27. Dec. 1. 4. 16. 21. Jan 6. 1932
During erection on board vessel ---
Total No. of visits

Dates of Examination of principal parts—Casings 4. 12. 31 Rotors 13. 11. 31 Blading 12. 11. 31 Gearing 21. 12. 31

Wheel shaft 13. 27/11. 31 Thrust shaft 13. 11. 31 Intermediate shafts ✓ Tube shaft ✓ Screw shaft ✓

Propeller ✓ Stern tube ✓ Engine and boiler seatings ✓ Engine holding down bolts ✓

Completion of pumping arrangements ✓ Boilers fired ✓ Engines tried under steam ✓

Main boiler safety valves adjusted ✓ Thickness of adjusting washers ✓

Rotor shaft, Material and tensile strength *S. M. Steel 34.2 t. per inch.*

Identification Mark *J.L. 9272. 11. 8. 31*

~~Pinion~~ Pinion shaft, Material and tensile strength *S. M. Steel 47. t. per inch.*

Identification Mark *J.L. 9272. 11. 8. 31*

~~Pinion~~ Pinion shaft, Material and tensile strength *S. M. Steel 47. t. per inch.*

Identification Mark *F.S. 1332. 30. 7. 31*

1st Reduction Wheel Shaft, Material and tensile strength *S. M. Steel 38.8 t. per inch.*

Identification Mark *A.C. 445 29. 11. 31*

Wheel shaft, Material *S. M. Steel* Identification Mark *M.K. 4148. 19. 8. 31* Thrust shaft, Material *S. M. Steel* Identification Mark *M.K. 4150. 26.*

Intermediate shafts, Material *S. M. Steel* Identification Marks *2515 F.K. 39. 31* 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 ✓

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 ✓

Is this machinery a duplicate of a previous case ✓ If so, state name of vessel ✓

General Remarks (State quality of workmanship, opinions as to class, &c. *The Exhaust Steam Turbine & Gear 440*

been constructed under Special Survey in accordance with the appr. plan, the Secretary's letter and otherwise in conformity with the requirements of the Rules. The Materials used in the construction and the workmanship are good. The Turbine casing and the oil coupling have been hydraulically tested to 2 mps. 8 hrs/cm² and found tight and sound. This Machinery is eligible in my opinion to be recorded in the Reg. Book with notation of: "S. M. Turbine D.R. gearing a hydraulic coupling". When satisfactorily fitted on board and tried under working conditions.

The amount of Entry Fee ... £ ✓ : When applied for, 20. 1. 19. 32
Special ... £ 25 : 0 :
Donkey Boiler Fee ... £ ✓ :
Travelling Expenses (if any) £ 0 : 10 : 23. 2. 19. 32

S. Carstensen
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

TUE. 4 OCT 1932

Assigned

*See Kob. J.E. Rpt
7879*



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