

EXHAUST REPORT ON STEAM TURBINE MACHINERY. No. 1689.

4a. Received at London Office **20 MAR 1935**
 Date of writing Report **15th March 1935** When handed in at Local Office **10** Port of **BREMEN**
 in Survey held at **BREMEN** Date, First Survey **12. 11. 34** Last Survey **8. 3. 1935**
 Book. (Number of Visits **16**)
 on the **STEEL S.S. THODE FAGELUND** Tons } Gross **4332**
 } Net **2623**
 built at **SUNDERLAND** By whom built **SIR J. LAING & SONS, L.D.** Yard No. When built **1920**
 Exhaust Steam Turbine & Gear made at **BREMEN** By whom made **DESCHIMAG, WERK A. G. WESER** Engine No. **DT 573** When made **1935**
 Turbines made at **EXHAUST TURBINE** By whom made **WILH. WILHELMOSEN** Boiler No. — When made —
 Horse Power at Full Power **1040** Owners **WILH. WILHELMOSEN** Port belonging to **TÖNSBERG**
 Horse Power as per Rule **TOTAL I.H.P. 3100** Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted
 made for which Vessel is intended —

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

of Turbines **EXHAUST** Ahead Direct coupled, single reduction geared } to propelling shafts. No. of primary pinions to each set of reduction gearing **1**
 Astern double reduction geared }
 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
 Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

TURBINE LOADING.	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.
EXPANSION												
"							94	744	1			
"							105	755	1			
"							116	766	1			
"							127	777	1			
"							141	791	1			
"							155	805	1			
"							170	820	1			

Shaft Horse Power at each turbine { H.P. — }
 { I.P. **1040** }
 { L.P. — }
 Revolutions per minute, at full power, of each Turbine Shaft { H.P. — }
 { I.P. — }
 { L.P. **4120** }
 1st reduction wheel **465/448**
 main shaft **76**

Motor Shaft diameter at journals { H.P. — }
 { I.P. — }
 { L.P. **125** }
 Pitch Circle Diameter { 1st pinion **170.3** }
 { 2nd pinion **338.3** }
 1st reduction wheel **1509.7** Width of { 1st reduction wheel **860** }
 main wheel **1995.3** Face { main wheel **600** }

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion **265** }
 { 2nd pinion **422.5** }
 1st reduction wheel —
 main wheel **525**

Flexible Pinion shafts, diameter { 1st }
 { 2nd }
 Pinion Shafts, diameter at bearings External { 1st **125** }
 Internal { 2nd **320** }
 diameter at bottom of pinion teeth { 1st **159.3** }
 { 2nd **321.8** }

Wheel Shafts, diameter at bearings { 1st **250/230** }
 { main **480** }
 diameter at wheel shroud, { 1st **1445** }
 { main **1901** }
 Generator Shaft, diameter at bearings
 Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter as per rule
 as fitted **13.5**
 Thrust Shaft, diameter at collars as per rule
 as fitted **356**

Tube Shaft, diameter as per rule
 as fitted
 Screw Shaft, diameter as per rule
 as fitted **15.5** 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 per rule
 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 **1850** 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 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 }

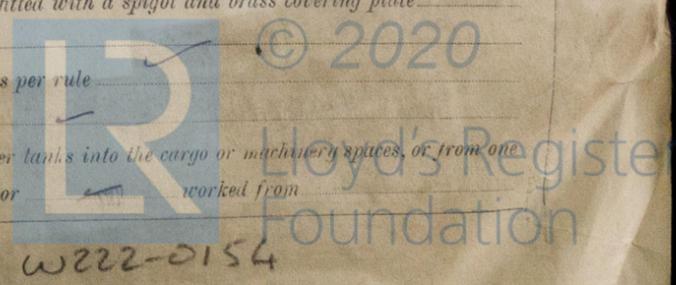
Ballast Pumps, No. and size — Lubricating Oil Pumps, including Spare Pump, No. and size
 Are two independent means arranged for circulating water through the Oil Cooler Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Engine and Boiler Room
 In Pump Room

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



W222-0154

BOILERS, &c.—(Letter for record) Total Heating Surface of Boilers
 Is Forced Draft fitted No. and Description of Boilers Working Pressure 180
 Is a Report on Main Boilers now forwarded?
 Is a Donkey 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 12.12.34 Main Boilers Auxiliary Boilers Donkey Boilers
 (If not state date of approval)
 Superheaters General Pumping Arrangements Oil Fuel Burning Arrangements

SPARE GEAR.
 Has the spare gear required by the Rules been supplied *yes*
 State the principal ~~additional~~ spare gear supplied
 1 set of *turn pads & bolts for Turbine Turm bearing*
 1 " " " " " " *for Propeller " "*
 1 " " " " " " *for Pinion II " "*
 1 " *bearing brasses for Turbine bearings*
 1 " " " " " " *1st pinion " "*

DEUTSCHE SCHIFF- UND MASCHINENBAU
 AKTIENGESELLSCHAFT
H. Hildebrandt *T. Hedemann* Manufacturer.

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops - - 12/11.34, 29/11.34, 30/11.34, 5/12.34, 18/12.34, 2/1.35, 25/1.35, 28/1.35, 2/2.35, 4/2.35, 5/2.35, 15/2.35, 19/2.35, 28.2.35, 5/3.35, 8/3.35
 During erection on board vessel - - -
 Total No. of visits 16

Dates of Examination of principal parts—Casings 2.2.35 Rotors 25.1.35 Blading 5.2.35 Gearing 28.2.35
 Wheel shaft 5.3.35 Thrust shaft 5.3.35 Intermediate shafts — Tube shaft — Screw shaft —
 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 —
 Main boiler safety valves adjusted — Thickness of adjusting washers —

Rotor shaft, Material and tensile strength *P.M. Steel 35.5 tons p. sq. inch* Identification Mark *LLOYD'S No. 440 J.S.H. 17.12.35 AC 5.3.35*
 Flexible Pinion Shaft, Material and tensile strength — Identification Mark
 Pinion shaft, Material and tensile strength *P.M. Nickel Steel 44.5 tons p. sq. inch* Identification Mark *LLOYD'S No. 15651 K.H. 26.11.34 AC 5.3.35*
 WITH PINION Identification Mark *LLOYD'S No. 10820 M.B. 14.12.34 AC 5.3.35*
 1st Reduction Wheel Shaft, Material and tensile strength *P.M. Steel 48.6 tons p. sq. inch* Identification Mark *LLOYD'S No. 10769 MB 28.11.34 AC 5.3.35*
 Wheel shaft, Material *P.M. Steel* Identification Mark *AC 5.3.35* Thrust shaft, Material *P.M. Steel* Identification Mark *LLOYD'S No. 437 J.S.H. 4.12.34 AC 5.3.35*
 PRIMARY WHEEL Identification Marks *LLOYD'S No. 461 AC 5.3.35* MAIN WHEEL RIM Identification Marks *LLOYD'S No. 10769 MB 28.11.34 AC 5.3.35*
 II-RED. WHEEL RIM Identification Marks *LLOYD'S No. 10740 MB 12.11.34 AC 5.3.35*
 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
 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 — If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c.) *This Exhaust Steam Turbine & Gear has been constructed under Special Survey in accordance with the approved plans, the Secretary's letters and otherwise in conformity with the requirements of the Rules. The materials used in the construction are made at works recognised by the Committee and tested by the Port Surveyors. The workmanship is of good quality. This machinery is eligible in my opinion to be recorded in the Port Reg. Book with notation of: "LP Turbine D.R. gearing & hydraulic coupling", when satisfactorily fitted on board and tried under working condition.*

The amount of Entry Fee ... £ : :
 Special ... RM 500, - : :
 Donkey Boiler Fee ... # : :
 Travelling Expenses (if any) £ 20, - : :
 When applied for, 18.3.1934
 When received, 16.5.35

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

Committee's Minute FRI. 21 JUN 1935

Assigned



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

THODH KEPLER LLOYD