

REPORT ON STEAM TURBINE MACHINERY.

Received at London Office MON. 30 APR. 1923

Date of writing Report 24 April 1923 When handed in at Local Office 28. 4. 1923 Port of Manchester
 No. in Survey held at Manchester Date, First Survey 5. 1. 23 Last Survey 23. 4. 1923
 Reg. Book. on the Rotating parts of Turbines and Double Reduction Gears. (Number of Visits)
 Built at Greenwich By whom built S.S. British Hussar. Tons } Gross
 Engines made at Manchester By whom made Metropolitan Vickers Elec. Co. Engine No. 2124/25 When made 1923 } Net
 Boilers made at _____ By whom made _____ Boiler No. _____ When made _____
 Shaft Horse Power at Full Power 3200 Owners _____ Port belonging to _____
 Nom. Horse Power as per Rule 611 Is Refrigerating Machinery fitted for cargo purposes _____ Is Electric Light fitted _____

STEAM TURBINE ENGINES, &c.—Description of Engines Rateau Impulse No. of Turbines Ahead 1 H.P. 1 L.P.
 Astern 1 H.P. 1 L.P.
 Direct coupled, single or double reduction geared to One propelling shaft. No. of primary pinions to each set of reduction gearing 2, direct coupled to _____ phase
 _____ periods per second, Alternating Current Generator rated _____ Kilowatts _____ Volts at _____ revolutions per minute; for supplying power for driving
 _____ Propelling Motors. Propelling Motors, Type _____
 rated _____ Kilowatts _____ Volts at _____ revolutions per minute. Direct coupled, single or double reduction geared to _____ propelling shafts.

PARTICULARS OF TURBINE BLADING.

| | H.P. | | | L.P. | | | H.P. ASTERN | | | 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 | $1/2 \times 1/8$ | $38 \frac{1}{2}$ | $39 \frac{3}{8}$ | 2 | $15 \frac{1}{16}$ | $39 \frac{5}{16}$ | 1 | 1" | $38 \frac{3}{4}$ | 2 on | $2 \frac{1}{2}$ | $36 \frac{1}{2}$ | 1 |
| 2ND " | $1/16$ | $38 \frac{11}{16}$ | 1 | 1 | $13 \frac{1}{16}$ | $39 \frac{13}{16}$ | 1 | $2 \frac{1}{8}$ | $39 \frac{7}{8}$ | 1 Wheel | $5 \frac{7}{8}$ | $39 \frac{7}{8}$ | 1 |
| 3RD " | $7/8$ | $38 \frac{7}{8}$ | 1 | 1 | $2 \frac{5}{16}$ | $40 \frac{5}{16}$ | 1 | | | | | | |
| 4TH " | $7/8$ | $38 \frac{7}{8}$ | 1 | 1 | $4 \frac{3}{16}$ | $42 \frac{3}{16}$ | 1 | | | | | | |
| 5TH " | 1 | 39 | 1 | 1 | $6 \frac{3}{8}$ | $44 \frac{3}{8}$ | 1 | | | | | | |
| 6TH " | | | | 1 | $8 \frac{1}{4}$ | $46 \frac{1}{4}$ | 1 | | | | | | |
| 7TH " | | | | 1 | $10 \frac{3}{16}$ | $48 \frac{3}{16}$ | 1 | | | | | | |
| 8TH " | | | | | | | | | | | | | |

Shaft Horse Power at each turbine 1600 Revolutions per minute, at full power, of each Turbine Shaft 3/25 1st reduction wheel 492.9
 main shaft 72.9 Pitch Circle Diameter, 1st pinion 6.7941 2nd pinion 11.6491 1st reduction wheel 43.10012 main wheel 78.2677
 Width of Face, 1st reduction wheel 20" main wheel 40" Distance between centres of pinion and wheel faces and the centre of the adjacent bearings,
 1st pinion 10 3/8" 2nd pinion 17 3/4" 1st reduction wheel 21" main wheel 35 1/2" Flexible Pinion Shafts, diameter 1st 3 1/8" 2nd 5 3/4"
 Pinion Shafts, diameter at bearings External 1st 6" 2nd 10" diameter at bottom of teeth of pinion 1st 6.21751" 2nd 10.73736"
 Internal 1st 3 7/16" 2nd 6"
 Wheel Shafts, diameter at bearings, 1st 10" main 19" diameter at wheel shroud, 1st _____ main _____
 Generator Shafts, diameter at bearings 5" Propelling Motor Shafts, diameter at bearings _____

Main Shafting, diameter of Tunnel Shafting as per rule _____ diameter of Thrust Shafting as per rule _____
 as fitted _____ diameter of Screw Shaft as per rule _____ Is the screw shaft fitted with a continuous liner the whole length of the stern tube _____
 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 joints burned _____
 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 appliance fitted at the after end of the shaft to permit of it being efficiently lubricated _____
 Length of Stern Bush _____ Diameter of Propeller _____
 Pitch of Propeller _____ No. of Blades _____ State whether Moveable _____ Total Surface _____ square feet. If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine, and either the H.P. or I.P. Turbine can exhaust direct to the Condenser _____
 No. of Turbines fitted with astern wheels _____ Total number of power driven Main and Auxiliary Pumps _____
 No. and size of Feed Pumps _____ How driven _____ No. and size of Pumps connected to the Main Bilge Line _____
 How driven _____ No. and size of Ballast Pumps _____ No. and size of Lubricating Oil Pumps, including Spare Pump _____
 Are two independent means arranged for circulating water through the Oil Cooler _____ No. and size of suction connected to both Main Bilge Pumps and Auxiliary Bilge Pumps;—In Engine and Boiler Room _____ and in Holds, &c. _____
 No. and size of Main Water Circulating Pump Bilge Suctions _____ No. and size of Donkey Pump Direct Suctions to the Engine Room Bilges _____
 Are all the bilge suction pipes in holds and tunnel well fitted with strum-bares _____
 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 connections with the sea direct on the skin of the ship _____ Are they Valves or Cocks _____
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates _____ Are the Discharge Pipes 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 are carried through the bunkers _____ How are they protected _____
 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 Screw Shaft Tunnel watertight _____ Is it fitted with a watertight door _____ worked from _____

See Newcastle report.

BOILERS, &c.—(Letter for record _____) Total Heating Surface of Boilers _____
 Is Forced Draft fitted _____ No. and Description of Boilers _____



W1630-0096

Is a Report on Main Boilers now forwarded?

Is a Donkey Boiler fitted?

If so, is a report now forwarded?

Plans. Are approved plans forwarded herewith for Shafting Yes Main Boilers. Auxiliary Boilers. Donkey Boilers.
(If not state date of approval)

Spare Gear. State the articles supplied:— One set of pads for turbine Mitchell thrust blocks, one high speed pinion complete with flexible coupling, two bearings for turbine rotor, one set high speed pinion bearings, one set intermediate shafts, two bolts and nuts for each side of gear bearing.

The foregoing is a correct description,

METROPOLITAN-VICKERS ELECTRICAL CO. LTD.,

TRAFFORD PARK
MANCHESTER

Manufacturer.

Simpson Mech. DO.

Dates of Survey while building } During progress of work in shops -- } 1923, Jan 5, 8, 10, 11, 15, 17, 22, 25, 31, Feb 5, 7, 13, 16, 21, 24, 26, Mar 1, 3, 6, 8, 13, 14, 19, 26, 28, Apr 5, 11, 13, 17, 19, 23, = 31
} During erection on board vessel --- }
Total No. of visits

Dates of Examination of principal parts—Casings Rotors 13 x 19, 4, 23 Blading 5 x 11, 4, 23 Gearing 22, 1, 23 / 17, 4, 23
Wheel shaft 17, 4, 23 Thrust shaft Tunnel shafts Screw shaft Propeller
Stern tube Engine and boiler seatings Engines holding down bolts
Completion of pumping arrangements Boilers fired Engines tried under steam
Main boiler safety valves adjusted Thickness of adjusting washers

Material and tensile strength of Rotor shaft *Mild Steel, HP. 30.7, LP. 40.0 Tm 0°* Identification Mark on Do. *771, WL, 768, 96, 15994, 16559, 15799, 16560*
Material and tensile strength of Flexible Pinion Shafts *Nickel Steel, 53.0, 48.0, 54.2, 48.2 Tm* Identification Mark on Do. *WL, WL, WL, WL, 15900, 15801, 15802, 15803, 15910, 15801, 15802, 15803*
Material and tensile strength of Pinion shafts *Nickel Steel, 45.5, 44.6, 44.8, 45.5 Tm 0°* Identification Mark on Do. *WL, WL, WL, WL, 15794, 15795*
Material and tensile strength of 1st Reduction Wheel Shafts *Mild Steel, 37.5, 37.6 Tm 0°* Identification Mark on Do. *WL, WL, 26049, 556*
Material of Wheel shaft *Mild Steel* Identification Mark on Do. *17, 4, 23, 94* Material of Thrust shaft Identification Mark on Do.
Material of Tunnel shafts Identification Marks on Do. Material of Screw shafts Identification Marks on Do.
Material of Steam Pipes 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 carrying and burning oil fuel been complied with
Is this machinery a duplicate of a previous case Yes If so, state name of vessel *Sun Hunter, W. Richter, S. No 1134*

General Remarks (State quality of workmanship, opinions as to class, &c.) *The above spindles, discs and blading, shafts, pinions, gears and details have been constructed under Special Survey and the materials tested in accordance with the Society's Rules, the materials and workmanship employed in their manufacture are sound and good. They have been forwarded to Newcastle a type for assembling in place.*

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

The amount of Entry Fee *Mech 4c* £ 18 : 0 : 0
Special ... £
Donkey Boiler Fee ... £
Travelling Expenses (if any) £

When applied for, 19...
When received, 31/7/23. Advised from Lon. to come back.
W. Lane Engineer Surveyor to Lloyd's Register of Shipping.
Spence

Committee's Minute TUE OCT. 16 1923
Assigned

