

REPORT ON STEAM TURBINE MACHINERY

Std. No. 28433

New No. 75821

OCT. 12 1922

Received at London Office 17 AUG. 19

Date of writing Report *Aug 14th 1922* When handed in at Local Office *Aug 15th 1922* Port of *NEWCASTLE-ON-TYNE*
 Date, First Survey *1920 Dec 30th* Last Survey *Aug 3rd 1922*
 No. in Survey held at *Malbend-on-Tyne* (Number of Visits *97*)
 Reg. Book. *244* on the *Steel Screw Steamer "Sandgate Castle"*
 Gross *7634*
 Net *4725*
 Tons
 Built at *Sunderland* By whom built *Short Bros Lim* Yard No. *408* When built *1922*
 Engines made at *Malbend* By whom made *Howe & Hornum & Co Lim* Engine No. *2470* When made *1922*
 Boilers made at *SE* By whom made *SE* Boiler No. *2470* When made *1922*
 Shaft Horse Power at Full Power *3200* Owners *Union Castle Mail S.S. & Co Lim* Port belonging to *London*
 Nom. Horse Power as per Rule *642* Is Refrigerating Machinery fitted for cargo purposes *No* Is Electric Light fitted *Yes*

STEAM TURBINE ENGINES, &c.—Description of Engines *Parsons geared turbines* No. of Turbines Ahead *3*
 Astern *2*
 Direct coupled, single or double reduction geared to *one* propelling shaft. No. of primary pinions to each set of reduction gearing *one*, 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 *—*
 Direct coupled, single or double reduction geared to *—* propelling shafts.

PARTICULARS OF TURBINE BLADING.

	H.P.			I.P.			L.P.			HP ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS. IMPULSE REACTION	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. IMPULSE REACTION
1 ST EXPANSION	$3/4 \times 1 1/4$	$2 5/8 \times 2 3/4$	1	$1 1/2$	$1 1/2$	6	$1 1/2$	$2 9/8$	5	$1 1/2 \times 2 1/2$	$2 1/2 \times 3 9/8$	1
2 ND	$1 3/8$	$1 3/8$	9	$1 1/8$	$1 1/8$	5	$3 3/8$	$2 1/2$	5	LP ASTERN.		
3 RD	$1 1/2$	$1 1/4$	9	$1 1/8$	$1 1/8$	4	$2 3/8$	$1 1/8$	2	$1 1/2 \times 1 1/8$	$4 3/8 \times 4 3/8$	1
4 TH				$1 1/8$	$2 2 3/4$	3	$4 7/8$	$4 7/8$	2	$1 1/8$	$3 4 1/2$	2
5 TH							$5 1/2$	$4 1/2$	1	$1 1/8$	$3 5 1/2$	2
6 TH							$5 1/2$	$4 1/2$	1	$2 1/4$	$3 6 1/2$	2
7 TH										$2 1/4$	$3 6 1/2$	1
8 TH										$2 1/4$	$3 6 1/2$	1

Shaft Horse Power at each turbine *HP = 800 LP = 1600* Revolutions per minute, at full power, of each Turbine Shaft *HP = 3600 LP = 2050* 1st reduction wheel *160*
 main shaft *74* Pitch Circle Diameter, 1st pinion *4.07* 2nd pinion *17.407* 1st reduction wheel *52.918* main wheel *115.464*
 Width of Face, 1st reduction wheel *14" HP* main wheel *2-8"* Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, *HP = 1-2 1/2 LP = 1-3 1/2*
 1st pinion *LP = 1-3 1/2* 2nd pinion *3-0 1/2* 1st reduction wheel *3-0 1/2* main wheel *8 1/2* Flexible Pinion Shafts, diameter 1st *—* 2nd *—*
 Pinion Shafts, diameter at bearings External *4 1/2 HP* Internal *5" LP* diameter at bottom of teeth of pinion 1st *LP = 11.8494* 2nd *17.4836*
 Wheel Shaft, diameter at bearings, 1st *11"* main *16"* diameter at wheel shroud, 1st *16 1/2"* main *1-8 to 1-4 15/16*
 Generator Shafts, diameter at bearings *—* Propelling Motor Shafts, diameter at bearings *—*

Main Shafting, diameter of Tunnel Shafting *as per rule 14.05" as fitted 14 3/4"* diameter of Thrust Shafting *as per rule 14.66" as fitted 15 1/2"*
 diameter of Screw Shaft *as per rule 15.5" with 16" liner 16.5" to liner as fitted 16 5/8"* Is the screw shaft fitted with a continuous liner the whole length of the stern tube *No* Is the after end of the liner

made watertight in the propeller boss *Yes* 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 *Yes* Lubricated under pressure *—* Length of Stern Bush *Hard 3-3 1/2 soft 6-2 1/2* Diameter of Propeller *18-6*

Pitch of Propeller *17-9* No. of Blades *4* State whether Moveable *Yes* Total Surface *106.65* 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 *Yes*

No. of Turbines fitted with astern wheels *2* Total number of power driven Main and Auxiliary Pumps *1-8" x 6" x 8" 1-6" x 6" x 15"*
 No. and size of Feed Pumps *2-8" x 10 1/2" x 21"* How driven *steam* No. and size of Pumps connected to the Main Bilge Line *2 as above*
 How driven *steam* No. and size of Ballast Pumps *one 12" x 12" x 14" stroke* No. and size of Lubricating Oil Pumps, including Spare Pump *2-9" x 8" x 18"*

Are two independent means arranged for circulating water through the Oil Cooler *Yes* No. and size of suction *2-3 1/2" in each hold 1-3" funnel well*
 connected to both Main Bilge Pumps and Auxiliary Bilge Pumps;—In Engine and Boiler Room *5-3 1/2"* and in Holds, &c. *—*
 No. and size of Main Water Circulating Pump Bilge Suctions *one 12"* No. and size of Donkey Pump Direct Suctions *—*
 to the Engine Room Bilges *one 3 1/2"* Are all the bilge suction pipes in holds and tunnel well fitted with strum-bones *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 connections with the sea direct on the skin of the ship *Yes* Are they 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 Discharge Pipes above or below the deep water line *below*
 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 are carried through the bunkers *None* How are they protected *—*
 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 Screw Shaft Tunnel watertight *Yes* Is it fitted with a watertight door *Yes* worked from *Upper platform*
 Duplicate # 2450

BOILERS, &c.—(Letter for record *B*) Total Heating Surface of Boilers *7860 for feed*
 Is Forced Draft fitted *Yes* No. and Description of Boilers *3 single ended multiburner* Working Pressure *220 lbs*

WS16-0241

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Is a Report on Main Boilers now forwarded?

no. This plan sent up with the report on the "Sandown Castle" no 74751

Is a Donkey Boiler fitted?

no

If so, is a report now forwarded?

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

no

Main Boilers

no

Auxiliary Boilers

none

Donkey Boilers

no

Spare Gear. State the articles supplied:—

see the other sheet

The foregoing is a correct description,
THE NORTH EASTERN MARINE ENGINEERING CO., LTD.

Manufacturer.

G. J. Harrison

Dates of Survey while building

During progress of work in shops --
During erection on board vessel --
Total No. of visits

1920. Dec 30 - 1921. Jan 14. 19. 25. 29. Feb 5. 9. 24. March 7. 24. April 11. 12. 15. 19. 20. 27. May 10. 24
1921. June 8. 29. July 6. 8. 14. 20. 22. 26. Aug 3. 9. 10. 11. 12. 19. 23. 30. Sept 2. 12. 14. 16. 21. 28. 30. Oct 6. 13. 14
1921. Oct 19. 20. 21. 28. Nov 4. 10. 16. 22. 23. 28. Dec 6. 7. 8. 13. 16. 19. 22. 23. 1922. Jan 5. 6. 10. 18. Feb 3. 4. 5
1922. Feb 21. 22. 27. March 2. 9. 14. 29. April 6. 10. 19. 25. May 3. 10. 17. 30. June 30. July 5. 6. 12. 13. 14. 19. 22. Aug 3.
105 97 Sld. 0%. Dec. 17. 22. 23. 0%. Aug. 24. Aug. Sep. 1. 14. Oct. 10
29. 6. 21

Dates of Examination of principal parts—Casings 22.2.22 Rotors 13.10.21 Blading 22.2.22 Gearing 6.12.21

Wheel shaft 13.10.21 Thrust shaft 19.1.21 Tunnel shafts 29.4.21 Screw shaft 19.1.21 Propeller 29.6.21

Stern tube 13.1.21 Engine and boiler seatings 21.2.22 Engines holding down bolts 12.7.22

Completion of pumping arrangements 3.8.22 Boilers fixed 12.7.22 Engines tried under steam 3.8.22

Main boiler safety valves adjusted 3.8.22 Thickness of adjusting washers Port 5/16 5/8 3/4 Center 5/16 5/8 3/4 Stem 3/4 5/8 3/4 Superheater all 5/8 3/4
LP = 3/4 5/8 3/4 IP = 3/4 5/8 3/4 HP = 3/4 5/8 3/4

Material and tensile strength of Rotor shaft Steel 34-38 tons Identification Mark on Do. HP = 3/4 5/8 3/4

Material and tensile strength of Flexible Pinion Shaft Identification Mark on Do.

Material and tensile strength of Pinion shaft Nickel Steel 40-45 tons Identification Mark on Do. LP = HP = LG = 10.21

Material and tensile strength of 1st Reduction Wheel Shaft Steel 34-38 tons Identification Mark on Do. HP = LP = LG = 10.21

Material of Wheel shaft Steel Identification Mark on Do. LG = 10.21 Material of Thrust shaft Steel Identification Mark on Do. C.N.S. 19.1.21

Material of Tunnel shafts Steel Identification Marks on Do. M.R. 27.4.21 Material of Screw shafts Steel Identification Marks on Do. C.N.S. 19.1.21

Material of Steam Pipes S.J. Steel Test pressure 660 lbs Date of test 30/6/22 - 5/10/22

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 carrying and burning oil fuel been complied with Yes

Is this machinery a duplicate of a previous case? Boilers yes. Turbines not quite the same. If so, state name of vessel S.S. Sandown Castle

General Remarks (State quality of workmanship, opinions as to class, &c.) This vessel's machinery has been examined

during construction, and the materials and workmanship are good and in accordance with the approved plans & the requirements of the rules. It has been tried under working conditions at the moorings with satisfactory results, when the safety valves were adjusted to the working pressure. The vessel has proceeded to Sunderland for completion and in order to render the machinery eligible for the notation of +L.M.C. with date a triple valve chest over the oil fuel unit is to be repaired & examined, the spare gear be verified, and the engines seen running at full power.

Triple valve chest over oil fuel unit repaired, examined & tested, spare gear examined, engines tried at full power. Machinery now eligible in our opinion for record + L.M.C. 10.22. Fitted oil fuel 10.22 F.P. above 150°F.

The amount of Entry Fee ... £ 6 : When applied for,

Special ... £ 107 : 3 : 16.8.1922

Donkey Boiler Fee ... £ : When received,

Travelling Expenses (if any) £ : 8.9.1922

Committee's Minute

TUE. 17 OCT. 1922

Assigned

+ L.M.C. 10.22

F.D. O.S.

Fitted for oil fuel 10.22
F.P. above 150°F.

CERTIFICATE WRITTEN



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