

REPORT ON MACHINERY.

No. 80400

Received at London Office

26 MAY 1926

Writing Report 19 When handed in at Local Office 22. 1926 Port of **NEWCASTLE-ON-TYNE**
 Survey held at **Walsend** Date, First Survey **17th Sept. 1925** Last Survey **18th May 1926**
 Book. **SS. CAIRNESS** (Number of Visits **48**)
 on the **Double reduction gearing. Turbines for W. Pickering & Sons** Tons { Gross
Engine No 234 7.7.216 } Net
 Built at **Tunderland** By whom built **W. Pickering & Sons** When built **1926**
 Engines made at **Walsend** By whom made **Parsons Marine Steam Turbine Co.** when made **1926**
 Repairs made at **do.** By whom made **Parsons Marine Steam Turbine Co.** when made **1926**
 Rated Horse Power **530 HP** Owners _____ Port belonging to _____
 Indicated Horse Power at Full Power **2875** Is Refrigerating Machinery fitted for cargo purposes _____ Is Electric Light fitted _____

TURBINE ENGINES, &c.—Description of Engines **Double reduction geared Turbines** No. of Turbines **3**
 Diameter of Rotor Shaft Journals, H.P. **4" IR 4"** L.P. **5 1/2"** Diameter of Pinion Shaft **H.P. 4 1/2" L.P. 6 1/2"**
 Diameter of Journals **10 1/2"** Distance between Centres of Bearings **6'-0"** Diameter of Pitch Circle **H.P. 4' 0" L.P. 11' 8" Primary 14' 6 1/2"**
 Diameter of Wheel Shaft **16 1/2"** Distance between Centres of Bearings **6'-1 7/8"** Diameter of Pitch Circle of Wheel _____
 Diameter of Face **14" 37"** Diameter of Thrust Shaft under Collars **16 3/4"** Diameter of Tunnel Shaft _____ as per rule **13'-1"**
 Diameter of Propeller **19'-0"** Pitch of Propeller **15'-4"** as fitted **13' 9"**
 Diameter of same as fitted **13 1/2"** Diameter of Rotor Drum, H.P. _____ L.P. _____ Astern _____
 Revs. per Minute at Full Power, Turbine **H.P. 14320** Propeller **815**
L.P. 2590

CHARACTERISTICS OF BLADING.

SECTION	H.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.	
1	5/8"	1'-1"	9	1 1/2"	1 3/4" - 1 7/8" - 2-7/8"	6	2 ROWS IMPULSE	2'-1 1/2" MEAN DIA.	4	
2	1 1/8"	1-1 1/4"	7	1 1/2"	2 1/8" - 1-6" - 2-8 7/8"	5	4	L.P. ASTERN.	4	
3	1 3/8"	1-3 1/8"	6	1 5/8"	3 1/4" - 1-8" - 2-6 1/8"	4	4	2 ROWS IMPULSE	3'-5 3/4" M.D.	
4	7/8"	1-4 3/4"	5	1 5/8"	2 1/8" - 1-10 7/8" - 3-9 1/4"	3	2	EXHA. REACTION.	2	
5				2 7/8"	3-10 1/4"	2	1	1-19/16"	2'-10 7/8"	1
6				3 3/4"	3-11 5/8"	1	2	1-13/8"	3'-0"	1
7				4"	4'-1"	1	3	1-11/8" 2 1/4"	3'-1 3/4"	1 EACH EXHA.
8				4 1/4"	4-2 3/8"	1				
9				5 1/4"	4-4 1/2" EACH EXHA.	1				

Size of Feed pumps **Two main 9 1/2" x 7" x 21, one aux 7" x 8" x 12"**
 Size of Bilge pumps **One 7" x 8" x 18"**
 Size of Bilge suction in Engine Room **3'-3", 1'-5"**

In Holds, &c. **NO. 1. 2-3", NO. 2. 2-3", NO. 3. 2 3/4" 704. 2-2 3/4"**
2-2 1/2" Deep tank 2-3 1/2"
 Are bilge suction pipes fitted with roses **YES** Are the roses in Engine room always accessible **YES**
 Are connections with the sea direct on the skin of the ship **YES** Are they Valves or Cocks **BOTH**
 Are discharge pipes 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 **BOTH**
 Are 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**
 Are pipes carried through the bunkers **BILGE PIPES** How are they protected _____
 Are pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times **YES**
 Are bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges **YES**
 Is the Shaft Tunnel watertight **YES** Is it fitted with a watertight door **YES** worked from **2nd Deck**

BOILERS, &c.—(Letter for record **(3)**) Manufacturers of Steel _____
 Heating Surface of Boilers **6646 sq ft** Is Forced Draft fitted **YES** No. and Description of Boilers **3-3**
 Working Pressure **180 lb** Tested by hydraulic pressure to _____ Date of test _____ No. of Certificate _____
 Can boiler be worked separately _____ Area of fire grate in each boiler _____ No. and Description of Safety Valves to _____
 Area of each valve _____ Pressure to which they are adjusted _____ Are they fitted with easing gear _____
 Distance between boilers or uptakes and bunkers or woodwork _____ Mean dia. of boilers _____ Length _____ Material of shell plates _____
 Range of tensile strength _____ Are the shell plates welded or flanged _____ Descrip. of riveting: cir. seams _____
 Diameter of rivet holes in long. seams _____ Pitch of rivets _____ Lap of plates or width of butt straps _____
 Working pressure of shell by rules _____ Size of manhole in shell _____
 No. and Description of Furnaces in each Boiler _____ Material _____ Outside diameter _____
 Thickness of plates _____ Description of longitudinal joint _____ No. of strengthening rings _____
 Combustion chamber plates: Material _____ Thickness: Sides _____ Back _____ Top _____ Bottom _____
 If stays are fitted with nuts or riveted heads _____ Working pressure by rules _____
 Diameter at smallest part _____ Area supported by each stay _____ Working pressure by rules _____ End plates in steam space _____
 Pitch of stays _____ How are stays secured _____ Working pressure by rules _____ Material of stays _____
 Area supported by each stay _____ Working pressure by rules _____ Material of Front plates at bottom _____
 Thickness _____ Greatest pitch of stays _____ Working pressure of plate by rules _____
 Material of Lower back plate _____ Thickness _____
 Material of tube plates _____ Thickness: Front _____ Back _____ Mean pitch of stays _____
 Working pressures by rules _____ Girders to Chamber tops: Material _____ Depth and _____
 Length as per rule _____ Distance apart _____ Number and pitch of stays in each _____
 Steam dome: description of joint to shell _____ Diameter of rivet holes _____
 Description of longitudinal joint _____ Diameter of rivet holes _____ Pitch of rivets _____
 Crown plates: Thickness _____ How stayed _____

SUPERHEATER. Type _____ Date of Approval of Plan _____ Tested by Hydraulic Pressure to _____
 Date of Test _____ Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler _____
 Diameter of Safety Valve _____ Pressure to which each is adjusted _____ Is Easing Gear fitted _____

IS A DONKEY BOILER FITTED? _____ If so, is a report now forwarded? _____

SPARE GEAR. State the articles supplied:— *In accordance with the Rules as per schedule attached.*

The foregoing is a correct description,

Manufacturer.

Dates of Survey while building
 During progress of work in shops: 1925 Sep. 17, Oct. 16, 19, 20, 30, Dec. 9, 23, 30. 1926 Jan. 7, 13, 18, 27, 28, Feb. 3, 7, 12, 15, 17, 19, 29, 25, Mar. 3, 5, 8, 9, 12, 15.
 During erection on board vessel: 16, 17, 18, 22, 23, 24, Apr. 7, 9, 12, 15, 22, 23, 26, 29, May 3, 4, 7, 11, 14, 18.
 Total No. of visits: 48.

Is the approved plan of main boiler forwarded herewith _____

Dates of Examination of principal parts—Casings 9, 12, 15, Rotors 13, 1, 26, Blading 7, 2, 26, Gearing 30, 4, 26.
 Rotor shaft 18, 11, 25, Thrust shaft 16, 3, 26, Tunnel shafts 17, 3, 26, Screw shaft 17, 3, 26, Propeller 11, 5, 26.
 Stern tube 13, 12, 25, Steam pipes tested 14, 5, 26, Engine and boiler seatings 16, 4, 26, Engines holding down bolts 11, 5, 26.
 Completion of pumping arrangements _____ Boilers fixed 11, 5, 26, Engines tried under steam _____
 Main boiler safety valves adjusted _____ Thickness of adjusting washers _____

Material and tensile strength of Rotor shaft *Steel 34-38 Lcm* Identification Mark on Do. *DR or LGS.*

Material and tensile strength of Pinion shaft *nickel steel 40-45 Lcm* Identification Mark on Do. *DR.*

Material of Wheel shaft *Steel* Identification Mark on Do. *LGS.* Material of Thrust shaft *Steel* Identification Mark on Do. *DR.*

Material of Tunnel shafts *Steel* Identification Marks on Do. *DR.* Material of Screw shafts *Steel* Identification Marks on Do. *DR.*

Material of Steam Pipes *Steel 11.5.26* Test pressure *340 lbs*

Is an installation fitted for burning oil fuel *NO* Is the flash point of the oil to be used over 150°F. *✓*

Have the requirements of Section 49 of the Rules been complied with *✓*
 Is this machinery a duplicate of a previous case *NO* If so, state name of vessel _____

General Remarks (State quality of workmanship, opinions as to class, &c.) *The machinery of this vessel has been constructed under special survey. The materials & workmanship are sound & good. It has been efficiently installed aboard the vessel on the main & auxiliary engines have been tried under steam. In my opinion the vessel is now eligible for notation + L.M.C. 7.26 CL in the Register Book.*

It is submitted that this vessel is eligible for THE RECORD. + L.M.C. 7.26. CL. FD. 3 Steam Turbines DR. geared to 1 screw shaft. 530.N.H.

[Signature]
 Engineer Surveyor to Lloyd's Register of Shipping.
 21.7.26

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 ... £ 6: -
 Special ... £ 101: 12
 Donkey Boiler Fee ... £ : :
 Travelling Expenses (if any) £ : :

When applied for, 25 MAY 1926
 When received, 31.7.19

Committee's Minute TUES. 27 JUL 1926

Assigned *+ L.M.C. 7:26. C.L. F.D. 3 Steam Turbines D.R. geared to 1 screw shaft*

