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# REPORT ON STEAM TURBINE MACHINERY. No. 93391

Received at London Office 20 JAN 1936

Date of writing Report 23/1/36 When handed in at Local Office 27/1/36 Port of NEWCASTLE-ON-TYNE

No. in Survey held at Newcastle on Tyne (Walker) Date, First Survey 16<sup>th</sup> Dec 1935 Last Survey 23<sup>rd</sup> Jan 1936  
Reg. Book. Steam Trawler (Number of Visits 9)

built at Hull By whom built Cook, Welton & Gemmel L<sup>d</sup> Yard No. 607 When built  
Engines made at Hull By whom made C. D. Holmes & Co L<sup>d</sup> Engine No. 1492 When made

STEAM TURBINE made at Newcastle on Tyne By whom made Swan Hunter & Wigham, Turbine Boiler No. 1510 When made 1936  
Shaft Horse Power at Full Power 304 Owners Richardson L<sup>d</sup> Port belonging to

nom. Horse Power as per Rule 51 Is Refrigerating Machinery fitted for cargo purposes  Is Electric Light fitted

Trade for which Vessel is intended

STEAM TURBINE ENGINES, &c.—Description of Engines Bauer-Wach Exhaust Steam Turbine geared to Compound Recip. Steam Engine

No. of Turbines Ahead One Direct coupled, single reduction geared to One propelling shaft. No. of primary pinions to each set of reduction gearing one  
Astern - double reduction geared

Direct coupled to Alternating Current Generator phase periods per second rated Kilowatts Volts at revolutions per minute;  
supplying power for driving Propelling Motors, Type

Known as Propelling Motors, Type 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.
1st EXPANSION							23 <sup>m</sup> / <sub>m</sub>	396 <sup>m</sup> / <sub>m</sub>	1			
2 <sup>nd</sup>							34 <sup>m</sup> / <sub>m</sub>	418 <sup>m</sup> / <sub>m</sub>	1			
3 <sup>rd</sup>							44 <sup>m</sup> / <sub>m</sub>	438 <sup>m</sup> / <sub>m</sub>	1			
4 <sup>th</sup>							54 <sup>m</sup> / <sub>m</sub>	458 <sup>m</sup> / <sub>m</sub>	1			
5 <sup>th</sup>							65 <sup>m</sup> / <sub>m</sub>	480 <sup>m</sup> / <sub>m</sub>	1			
6 <sup>th</sup>							75 <sup>m</sup> / <sub>m</sub>	500 <sup>m</sup> / <sub>m</sub>	1			
7 <sup>th</sup>							87 <sup>m</sup> / <sub>m</sub>	524 <sup>m</sup> / <sub>m</sub>	1			
8 <sup>th</sup>							100 <sup>m</sup> / <sub>m</sub>	550 <sup>m</sup> / <sub>m</sub>	1			

Shaft Horse Power at each turbine { H.P.  I.P.  L.P. 304  Revolutions per minute, at full power, of each Turbine Shaft { H.P.  I.P.  L.P. 6800 1st reduction wheel 715 main shaft 116

Pinion Shaft diameter at journals { H.P.  I.P.  L.P. 99.9<sup>m</sup>/<sub>m</sub> Pitch Circle Diameter { 1st pinion 115.718<sup>m</sup>/<sub>m</sub> 1st reduction wheel 1101.185<sup>m</sup>/<sub>m</sub> 2nd pinion 201.342<sup>m</sup>/<sub>m</sub> main wheel 1191.727<sup>m</sup>/<sub>m</sub> Width of Face { 1st reduction wheel 110<sup>m</sup>/<sub>m</sub> main wheel 340<sup>m</sup>/<sub>m</sub>

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 112<sup>m</sup>/<sub>m</sub> overhung 1st reduction wheel 196<sup>m</sup>/<sub>m</sub> 2nd pinion 268<sup>m</sup>/<sub>m</sub> main wheel 275<sup>m</sup>/<sub>m</sub> 1st 109.94<sup>m</sup>/<sub>m</sub> 2nd 197.64<sup>m</sup>/<sub>m</sub>

Pinion Shafts, diameter at bearings External 1st 99.9<sup>m</sup>/<sub>m</sub> 2nd 180<sup>m</sup>/<sub>m</sub> diameter at bottom of pinion teeth { 1st 109.94<sup>m</sup>/<sub>m</sub> 2nd 197.64<sup>m</sup>/<sub>m</sub>  
Propeller Shaft, diameter at bearings { 1st 1030<sup>m</sup>/<sub>m</sub> Generator Shaft, diameter at bearings  main 1087<sup>m</sup>/<sub>m</sub> Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter as per rule  as fitted  Thrust Shaft, diameter at collars as per rule approved 220-205<sup>m</sup>/<sub>m</sub> as fitted 220 + 205<sup>m</sup>/<sub>m</sub>  
Screw Shaft, diameter as per rule  as fitted  Is the { tube screw } shaft fitted with a continuous liner

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 hull 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   
If so, state type  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.  
Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine No. 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

Oil Pumps, No. and size  Lubricating Oil Pumps, including Spare Pump, No. and size Two Weirs Simplex Vertical 6" x 5 1/2" x 15"  
Two independent means arranged for circulating water through the Oil Cooler  Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge In Pump Room

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

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 fitted 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   
Are the pipes pass through the bunkers  How are they protected   
Are the 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   
Are the arrangements 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? \_\_\_\_\_ If so, is a report now forwarded? \_\_\_\_\_  
 { an Auxiliary }

Is the donkey boiler intended to be used for domestic purposes only \_\_\_\_\_

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

Superheaters \_\_\_\_\_ General Pumping Arrangements \_\_\_\_\_ Oil Fuel Burning Arrangements \_\_\_\_\_

Has the spare gear required by the Rules been supplied Yes, viz. 2 studs & nuts each for turbine bearings & pinion beater

State the principal additional spare gear supplied  
 2 tap bolts for 2<sup>nd</sup> redn wheel bearings,  
 2 bolts & nuts for turbine casing joint & gear case  
 2 Studs & nuts for gear case middle joint, top joint  
 14 Michell pads for main thrust bearing,  
 1 thrust ring for 2<sup>nd</sup> redn pinion thrust bearing  
 10 Michell pads for turbine thrust bearing,  
 2 liners for turbine thrust bearing,  
 1 Spring & set of washers for turbine governor

For SWAN, HUNTER, & WIGHAM RICHARDSON, Limited.

*Geo. Blough*

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops - - } 1935 Dec. 16, 24, 27, 30, 31, 1936 Jan. 3, 8, 14, 16, 20, 22, 23.  
 { During erection on board vessel - - - }  
 Total No. of visits 9.

Dates of Examination of principal parts—Casings 8-1-36 Rotors 3-1-36 Blading 23-1-36 Gearing 20-1-36

Wheel shaft 20-1-36 Thrust shaft 20-1-36 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 fired  Engines tried under steam 22-1-

Main boiler safety valves adjusted  Thickness of adjusting washers

Rotor shaft, Material and tensile strength S.M. Steel 38.4 tons/sq Identification Mark 5920 HAI. 915

1<sup>st</sup> Redn Pinion shaft, Material and tensile strength S.M. Steel 45.2 tons/sq Identification Mark 5918 HAI. 6377

2<sup>nd</sup> Redn Pinion shaft, Material and tensile strength S.M. Steel 45.0 tons/sq Identification Mark 5918 HAI. 6581

1<sup>st</sup> Redn Wheel shaft, Material and tensile strength S.M. Steel 32.4 tons/sq Identification Mark 5920 HAI. 929

2<sup>nd</sup> Redn Wheel shaft, Material S.M. Steel Identification Mark 5920 HAI. 939 Thrust shaft, Material S.M. Steel Identification Mark 5920 HAI. 92

Intermediate shafts, Material  Identification Marks  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

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 Yes If so, state name of vessel Kingston Chrysoberyl.

General Remarks (State quality of workmanship, opinions as to class, &c.) also SHWR no 1474, 74C Rpt 9228

The Machinery has been constructed under Special Survey in accordance with the rules, The turbine was examined under steam on test bed, and found satisfactory. The materials & workmanship are good. The machinery is being forwarded to Hull to be installed in conjunction with Reciprocating Engines.

also " no 1472, " " 9227 "

" no 1470, " " 9227 "

When applied for, 29 JAN 1936

When received, 11-2-36

The amount of Entry Fee ... £ 3 : 8

Special 2/3<sup>rd</sup> at 7/2

Donkey Boiler Fee ... £

Travelling Expenses (if any) £

Committee's Minute TUE. 10 MAR 1936

Assigned See Hull J.E. 46607

*A. Watt*  
 Engineer Surveyor to Lloyd's Register of Shipping.



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