

REPORT ON STEAM TURBINE MACHINERY.

No. 2576

Rpt. 4a.

Received at London Office 6 AUG 1935

Date of writing Report 29th July 1935 When handed in at Local Office 19 Port of Barrow

Survey held at Barrow Date, First Survey 22nd January 1934 Last Survey 25th July 1935

Reg. Book. 188 on the Twin Screw Steamer "Orion" (Number of Visits 22)

Tons Gross 2337 1/2 Net 1409 8

When built 1935

Engines made at By whom made Engine No. - When made -

Boilers made at By whom made Boiler No. - When made -

Shaft Horse Power at Full Power 24000 Owners Orient Steam Navigation Co. Ltd. Port belonging to London.

Indicated Horse Power as per Rule 4912 Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

Trade for which Vessel is intended Australian Mail & Passenger.

STEAM TURBINE ENGINES, &c.—Description of Engines. Parsons Impulse Reaction Type.

of Turbines Ahead Six Direct coupled, single reduction geared to Two propelling shafts. No. of primary pinions to each set of reduction gearing

Not coupled to Alternating Current Generator phase periods per second Direct Current Generator rated Kilowatts Volts at revolutions per minute;

supplying power for driving Propelling Motors, Type

Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

TURBINE	H.P.			I.P.			L.P.			HP 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	5 1/8"	2'-3 1/4"	13	17 1/4"	3'-2 7/8"	4	3'-3 3/4"	5'-0 1/2"	1	9 1/4"	5'-0 1/4"	1
"	1 1/8"	2'-4 7/16"	13	17 1/8"	3'-3 6/7"	4	"	"	1	1 5/16"	5'-1 5/8"	1
"	1 5/16"	2'-4 13/16"	10	2 7/16"	3'-4 7/8"	4	"	"	1	1 3/4"	5'-2"	1
"	1 9/16"	2'-5 9/16"	10	3 1/8"	3'-6 1/7"	6	3'-9 1/8"	5'-1 8/16"	1	LP ASTERN		
"	1 3/4"	2'-5 13/16"	10	4"	3'-4 9/11"	4	4'-6 5/5"	5'-3 3/31"	1			
"	2 1/4"	2'-6 9/16"	10	4 9/16"	3'-9 0/35"	4	5'-3 8/6"	5'-4 7/72"	1	1 7/8"	5'-2 1/8"	1
"	HP Head Impulse Blading			5 1/8"	3'-10 1/16"	4	6'-2 2/5"	5'-6 4/5"	1	LP ASTERN		
"				11 1/16"	6'-4 3/32"	1	7'-0 7/7"	5'-8 1/14"	1			
"	(1) 5 1/8"	4'-8 3/4"	1	11 1/16"	6'-4 3/32"	1	4'-9 1/5"	5'-9 8/3"	1	(1) 3'-19"	4'-3 3/8"	2
"	(2) 3 1/8"	4'-9 1/8"	1	"	"	1	8'-7 6/6"	5'-11 5/22"	1	(2) 3'-8 0/5"	4'-4 6/11"	2
"	"	"	"	"	"	1	9'-7 3/36"	6'-1 4/72"	1	(3) 4'-4 2/25"	4'-5 9/65"	2
"	"	"	"	"	"	1	10'-8 8/2"	6'-3 7/64"	1	(4) 5'-3 4/75"	4'-7 6/95"	2
"	"	"	"	"	"	1	"	"	1	(5) 6'-4"	5'-9 8/8"	2

Shaft Horse Power at each turbine H.P. 4000 I.P. 4000 L.P. 4000

Revolutions per minute, at full power, of each Turbine Shaft H.P. 1716 I.P. 1716 L.P. 1716

1st reduction wheel main shaft 112

Shaft diameter at journals H.P. 8" I.P. 8 1/2" L.P. 9 1/2"

Pitch Circle Diameter 1st pinion 10'-1404 1st reduction wheel main wheel 155'-9946

Width of Face 1st reduction wheel main wheel 50'-17 1/2 Gap

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings

Pinion Shafts, diameter at bearings External 8 1/2" Internal 3"

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BOILERS, &c. — (Letter for record *S*) Total Heating Surface of Boilers *37030* #
Is Forced Draft fitted *Yes* No. and Description of Boilers *Six Water Tube* Working Pressure *450 lb*
Is a Report on Main Boilers now forwarded? *Yes, already in London*
Is *a Donkey* Boiler fitted? *No* If so, is a report now forwarded?

Plans. Are approved plans forwarded herewith for Shafting *Yes* Main Boilers *2/3/34; 22/3/34* Auxiliary Boilers *✓* Donkey Boilers *✓*
(If not state date of approval)
Superheaters *18/6/34* General Pumping Arrangements *Yes* Oil Fuel Burning Arrangements *Yes*

Spare Gear. State the articles supplied: — 26 Bolt studs & nuts for main and main gear wheel bearings, 4 studs & nuts for pinion gear
94 Bolt studs for turbine horizontal pinion; 20 for gear case pinion; One bearing complete for H.P. & S.P. and H.P. & S.P. for
for gear wheel bearings; One set of bushes for pinion bearings; 8 Carbon rings, 16 Springs and binding wires for each of
H.P. & S.P. glands; One set of Thrust Pads and liners for each. Adjusting block; One set of Pads for main Thrust block;
of Group valves, suction & delivery for Auxiliary Feed Pumps; One turbine shaft complete with turbine wheel and two pumps
for main feed pumps; One set of valves (suction & delivery) for 3 throw Bilge Pump and two Bilge pumps; Pump spindle and Impeller
each type of Bilge pump; One spindle and Impeller for main circulating pump; Nuts for Auxiliary Circulating Pump; 1 Spare
each size of relief valve spring; Six safety valve springs. One screw shaft complete and 4 Propeller blades; 20
main Condenser tubes and 20 for Auxiliary. Etc. Etc.

VICKERS-ARMSTRONGS LTD.
Mutchell

The foregoing is a correct description,

Dates of Survey while building
During progress of work in shops — 1934 — Jan 22, Feb 7, 13, Mar 17, 22, 27, Apr 10, 11, 16, 17, 20, 25, 27, May 1, 2, 3, 4, 7, 9, 11, 15, 18, 22, 24, 25, 28, 29, 30, June 1, 4, 6, 13, 18, 22, 27, 29, July 1, 3, 4, 6, 9, 10, 12, 13, 16, 18, 19, 20, 23, 24, 27
During erection on board vessel — 1935 — Jan 2, 3, 4, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 21, 22, 23, 25, 28, 29, 30, Feb 1, 4, 5, 6, 8, 11, 13, 15, 18, 19, 20, 22, 25, 26, 27, 28, Mar 1, 4, 5, 6, 8, 11, 12, 14, 18, 21, 29, Apr 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25
Total No. of visits 221 15215

Dates of Examination of principal parts — Casings 12/10/34 Rotors 12/10/34 Blading 19/12/34 Gearing 19/12/34
Wheel shafts 19/12/34 Thrust shafts 18/10/34 & 6/11/34 Intermediate shafts 18/10/34 & 6/11/34 Tube shaft *✓* Screw shafts 18/10/34 & 6/11/34
Propellers 18/10/34 & 6/11/34 Stern tubes 13/10/34 & 5/10/34 Engine and boiler seatings 11/12/34 Engine holding down bolts 8/5/35
Completion of pumping arrangements 24/6/35 Boilers fixed 8/5/35 Engines tried under steam 22/7/35

Main boiler safety valves adjusted 10/7/35 Thickness of adjusting washers *Siemens Steel* 25/36 tons Identification Mark *Yes, Number and W*
Rotor shaft, Material and tensile strength *Siemens Steel* 44/46 tons Identification Mark *✓*
Flexible Pinion Shaft, Material and tensile strength *Siemens Steel* Identification Mark *No. 644 W.C.*
Pinion shaft, Material and tensile strength *Siemens Steel* Identification Marks *✓*
1st Reduction Wheel Shaft, Material and tensile strength *Siemens Steel* Identification Marks *No. 644 W.C.*
Wheel shaft, Material *Siemens Steel* Identification Marks *✓*
Intermediate shafts, Material *Siemens Steel* Identification Marks *✓*
Screw shafts Material *Siemens Steel* Identification Marks *No. 644 W.C.* Steam Pipes, Material *Steel* Test pressure 1350 lb
Date of test 29/1/35 to 25/4/35 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 *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
built in accordance with the approved plans and the Rules. The materials and
workmanship are good. It has been efficiently fitted on board and proved satisfactory
under full power working conditions. In my opinion the vessel is eligible to have the notation
L.M.O. 7.35 made in the Register Book

Certificate (if required) to be sent to...

The amount of Entry Fee ... £ 6 - 0 - 0 When applied for, 1st Aug 1935
Special ... £ 222 : 16 : 0
(Less £ 135 - 18 - charged) 86 : 18 : 0
Donkey Boiler Fee ... : : :
on 55309
Travelling Expenses (if any) £ 5 : 2 - 6 2nd Aug 1935
When received,

Mrs. Davis
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 9 AUG 1935
Assigned + L.M.O. 7.35 Subject
J.D., C.L.

TUE. 13 AUG 1935