

EC VIEW

17 JUN 1946

RPT 4a

# REPORT ON STEAM TURBINE MACHINERY. No. 103755

Received at London Office: 14 JUN 1946

Date of writing Report 2nd/6/1946 When handed in at Local Office 11.6.46 Port of NEWCASTLE ON TYNE.

No. in Survey held at Newcastle Date, First Survey (1944) Jan. 14th Last Survey May 31st 1946  
Reg. Book. on the S/S WAVE KNIGHT, ex EMPIRE NASEBY. (Number of Visits 96)

Built at Sunderland By whom built Sir James Laing & Co. Ltd Yard No. 764 When built 1946-

Engines made at Wallsend Newcastle By whom made N.E. Mar. Eng. Co. (1938) Ltd. Engine No. 3091 When made 1946  
Main D/R Gearing WEST DRAYTON By whom made POWER PLANT CO. S.O. 4/1904. CASE T. 589.  
Boilers made at Renfrew. By whom made Baberch & Wilson Ltd Boilers No. 6/1786 When made 1945.

Shaft Horse Power at Full Power 6800 Owners The Adm. M/S. Port belonging to \_\_\_\_\_

Nom. Horse Power as per Rule 1400 (MN. 1496) Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

Trade for which Vessel is intended Ocean going, Carrying Petroleum in bulk

## STEAM TURBINE ENGINES, &c.—Description of Engines HP & LP Turbines, D/R Gearing to one Screw Shaft.

No. of Turbines Ahead 2 Direct coupled, single reduction geared } to one propelling shaft. No. of primary pinions to each set of reduction gearing 2  
Astern } double reduction geared

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

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

TURBINE BLADING.	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	1.23"	17.46"	7.				0.875"	39 3/4"	3.	Rotor 4"	49 1/2"	1.
2ND "	1.52	18.04	7				1.324	Cylr	1.	" 7"	52 3/4"	1.
3RD "	1.68	18.36	6				1.896	bore is	1.	" 9"	55"	1.
4TH "	2.07	19.14	6				2.468	tapered	1.	IMPULSE BLADING		
5TH "	2.58	20.16	6				3.109	between	1.			
6TH "	The above blading is preceded by 2 rows IMPULSE WHEEL blades as per particulars below:-						3.824	14 + 12 1/2"	1.			
7TH "							4.539	Expansions	1.			
8TH "							5.3	to	1.			
9TH "							6.13	to	1.			
10TH "	1.715	30.47	1				7.047	to	1.			
11TH "	1.68	31.69	1				8.185	to	1.			
12TH "							9.0	56"	1.			

Shaft Horse Power at each turbine { H.P. 3500 ✓ } Revolutions per minute, at full power, of each Turbine Shaft { H.P. 3969 ✓ 1st reduction wheel 731 ✓  
L.P. 3309 ✓ } H.P. \_\_\_\_\_ } L.P. 2863 ✓ main shaft 116 ✓

Rotor Shaft diameter at journals { H.P. 5" ✓ } Pitch Circle Diameter { 1st pinion HP 9.426" ✓ } 1st reduction wheel 51.204" ✓ } Width of Face { 1st reduction wheel 20 1/2 + 3 GAP ✓  
L.P. 7" ✓ } 2nd pinion LP 13.068" ✓ } main wheel 124.647" ✓ } main wheel 39 + 24 1/2 GAP ✓

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 10 1/8" ✓ } 1st reduction wheel 32 1/8" ✓  
2nd pinion 16 3/4" ✓ } main wheel 20" ✓ } HP " LP "

Flexible Pinion Shafts, diameter { 1st \_\_\_\_\_ } Pinion Shafts, diameter at bearings { External HP 6 1/2" ✓ } 1st \_\_\_\_\_ } diameter at bottom of pinion teeth { 1st 8.91 ; 12.552 ✓  
2nd \_\_\_\_\_ } Internal LP 13.068" ✓ } 2nd \_\_\_\_\_ } 2nd 18.941" ✓

Wheel Shafts, diameter at bearings { 1st 11" ✓ } diameter at wheel shroud, { 1st 3-11" ✓ } Generator Shaft, diameter at bearings \_\_\_\_\_ ✓  
main 17 1/2" ✓ } main 9-11 3/4" ✓ } Propelling Motor Shaft, diameter at bearings \_\_\_\_\_ ✓

Intermediate Shafts, diameter as per rule 15.54" ✓ } Thrust Shaft, diameter at collars as per rule 16.31 ✓ } nichel  
as fitted 16 1/8" ✓ } as fitted 17" ✓ }

Tube Shaft, diameter as per rule \_\_\_\_\_ } Screw Shaft, diameter as per rule 17.04 ✓ } Is the \_\_\_\_\_ } shaft fitted with a continuous liner { Yes ✓  
as fitted \_\_\_\_\_ } as fitted 17 3/4" ✓ } screw } \_\_\_\_\_ }

Bronze Liners, thickness in way of bushes as per rule 1.821" ✓ } Thickness between bushes as per rule 1.615" ✓ } Is the after end of the liner made watertight in the propeller boss Yes ✓  
as fitted 7/8" ✓ } as fitted 3/4" ✓ } If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner In one piece.

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 a close fit.  
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 shaft No ✓ } If so, state type \_\_\_\_\_ } Length of Bearing in Stern Bush next to and supporting propeller 70" ✓

Propeller, diameter 18'-0" ✓ } Pitch MEM. 13-11 3/4" ✓ } No. of Blades 4 ✓ } State whether Moveable No ✓ } Total Developed Surface 121 ✓ } square feet.  
If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Yes ✓ } Can the H.P. ~~and~~ Turbine exhaust direct to the Condenser Yes ✓ } No. and size Two of 3" Weir 2 stage Turbo-feed ✓ }  
No. of Turbines fitted with astern wheels One ✓ } MAIN BLRS. Feed Pumps } How driven each by Stm. Turb. } Two of 9 1/2" x 7" x 21" } Steam driven

Pumps connected to the Main Bilge Line { No. and size Two of 10" x 9" x 10" ✓ } } G.S.P. 7" x 4 1/2" x 8" ✓ }  
How driven by Steam ✓ } DONK. BLRS. FEED PUMPS. } \_\_\_\_\_ } \_\_\_\_\_ }

Ballast Pumps, No. and size only 10" 9" x 10" ✓ } Lubricating Oil Pumps, including Spare Pump, No. and size Two, 8" 9" x 18" ✓ }  
Are two independent means arranged for circulating water through the Oil Cooler Yes ✓ } Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Engine and Boiler Room 4 of 3 1/2" ✓ } 1 of 2 1/2" in tunnel well. ✓ } In Pump Room one of 3" ✓ }  
In Holds, &c. \_\_\_\_\_ ✓ }

Main Water Circulating Pump Direct Bilge Suctions, No. and size 1 of 13 1/2" on p. side ✓ } Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 1 of 5" on Sth side ✓ } Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes 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 Sea Connections fitted direct on the skin of the ship Yes ✓ } Are they fitted with 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 Overboard Discharges 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 pass through the bunkers \_\_\_\_\_ } How are they protected \_\_\_\_\_ }  
What 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 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 Shaft Tunnel watertight Yes ✓ } Is it fitted with a watertight door No ✓ } worked from \_\_\_\_\_ ✓ }

CONTS OVER.

Lloyd's Register Foundation

004116-004124-0018

BOILERS, &c. (Letter for record *S.*) Total Heating Surface of Boilers *10400 sq. ft. (Superheat surface 1650 sq. ft.)*

Is Forced Draft fitted *Yes* No. and Description of Boilers *2, W.T. BABCOCK & WILCOX* Working Pressure *460 LBS/IN*

Is a Report on Main Boilers now forwarded? *Yes. Rpt by Brit. Corp.* *BRS. N°6/1786* B.C. Test. *N°7416 TP740 N°7417*

Is *a Donkey* Boiler fitted? *Yes. Two BLS.* If so, is a report now forwarded? *Yes* *Abertem Rpt N°21498.*

Is the donkey boiler intended to be used for domestic purposes only *No. For Steam Aways etc.*

Plans. Are approved plans forwarded herewith for Shafting *1/2/44* Main Boilers *Brit Corp Rpt.* Auxiliary Boilers *—* Donkey Boilers *Abertem Rpt*

Superheaters *Brit Corp Rpt.* General Pumping Arrangements *1/3/45* Oil Fuel Burning Arrangements *26/9/45.*

Has the spare gear required by the Rules been supplied *Yes* **SPARE GEAR.**

State the principal additional spare gear supplied *As per Specification.*

THE NORTH EASTERN MARINE ENGINEERING CO. (1938) LTD.

The foregoing is a correct description,

*J. M. Hubert*

Manufacturer.

Dates of Survey *(1944) Jan. 14, Mar. 23, 24, Apr. 4, 19, July 31, Aug. 1, 9, 11, 15, 25, Sept. 8, 28, Oct. 9, 24, Nov. 15, 21, 30. (1945) Jan. 5, 11, Mar. 16, 19, 16th*

During progress of work in shops -- *May 4, 10, 11, 17, 23, June 13, 28, July 6, Aug. 8, 13, 31, Sept. 5, 6, 7, 12, 18, Oct. 5, 10, 11, 22, 30, Nov. 6, 9, 14, 15, 20, 26,*

During erection on board vessel --- *Dec. 4, 6, 13, 28, (1946) Jan. 10, 14, 16, 18, 23, 24, 28, 30, Feb. 1, 4, 5, 7, 8, 11, 12, 14, 15, 18, 19, 20, 22, 25, 27, Mar. 1, 4, 6,*

Total No. of visits *96*

Dates of Examination of principal parts—Casings *HP 4-5-45 LP 11-5-45* Rotors *5/1/45.* Blading *4-5-45.* Gearing *Sea Lond. Rpt N°113085*

Wheel shaft *12-2-46* Thrust shaft *6-7-45* Intermediate shafts *11-10-45* Tube shaft *✓* Screw shaft *10-10-45.*

Propeller *at ship 16-10-45 (std)* Stern tube *at ship 24-9-45 (std)* Engine and boiler seatings *4-12-45* Engine holding down bolts *12-2-46*

Completion of fitting sea connections *16-10-45 (std)* Completion of pumping arrangements *15-9-46* Boilers fixed *12-2-46* Engines tried under steam *at Quay. 15-4-46*

Main boiler safety valves adjusted *1/5/46* Thickness of adjusting washers *Part BLR 7/16 7/16 3/8* SPT V. *3/8*

Rotor shaft, Material and tensile strength *Forged S.M. HPRotor 40.4 tons; BL 44.8 tons* Identification Mark *J2507 WK.*

Flexible Pinion Shaft, Material and tensile strength *LP. " FOR END L. 37.1 tons; T. 34.6 tons - S. 8890. WK.* Identification Mark *J2493 BK.*

Pinion shaft, Material and tensile strength *See London Rpt N°113085* Identification Mark *on Power Plant Dr Clearing, S.O. 41504 Case N° T. 589.*

1st Reduction Wheel Shaft, Material and tensile strength *See London Rpt N°113085* Identification Mark *Case N° T. 589.*

Wheel shaft, Material *O.H. Forged Steel* Identification Mark *Thrust shaft, Material O.H. Forged Steel* Identification Mark *8228 C.P.*

Intermediate shafts, Material *O.H. Forged Steel* Identification Marks *8205 CP; 8212 CP; 8218 C.P.* Identification Marks *Tube shaft, Material*

Screw shaft, Material *O.H. Forged Steel* Identification Marks *8208 C.P.* Steam Pipes, Material *S.D. Stl. (O.H.)* Test pressure *1470 lb.*

Date of test *1-2-46 to 14-3-46.* 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 the use of oil as fuel been complied with *Yes*

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 *not desired.*

Is this machinery a duplicate of a previous case *Yes* If so, state name of vessel *EMARE SALISBURY (have Rpt 102560) Lang's Yard No 754 NE Mar. Trib. No 3074.*

General Remarks (State quality of workmanship, opinions as to class, &c.)

*The Main Boilers (Babcock & Wilcox W.T. type) have been built under British Corp Survey, the Main Furth & the 2 Donkey Blos have been constructed under Special Survey of this Society in accordance with the Society's approved plans & Specification and the whole of the machinery has been efficiently installed on board under Special Survey, and the materials and workmanship are good.*

*The machinery has been satisfactorily tested under working conditions at Quay and at Sea, and is eligible, in my opinion for record LMC \* 5.46. and the notations 2 W.T. Blos 460th. FD. 2 D.B. 180lb. TS. CL. machy aft.*

The amount of Entry Fee £ : : When applied for, *193 JUN 1946*

Special *2/5 for Turb 547* £ 81 : 0 : -

Donkey Boiler Fee ... £ 20 : 5 : -

Travelling Expenses (if any) £ : : When received, 19.....

*a watt.*

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute *FRI. 28 JUN 1946*

Assigned *LMC \* 5.46*

FOR OIL FUEL *5.46 FLASH POINT ABOVE 150°F. F.D. C.L. 2 WTB 460lb (Spt. 440lb) 2 D.B. 180lb.*



NEWCASTLE-ON-TYNE

The Surveyors are requested not to write on or below the space for Committee's Minute.