

Received at London Office WED. 25 OCT. 1916

Date of writing Report 16<sup>th</sup> Octbr. 1916 When taken in at Local Office 10 Port of Copenhagen  
 No. in Survey held at Copenhagen Date, First Survey 1<sup>st</sup> October Last Survey 24<sup>th</sup> June 1916  
 Reg. Book. 621. on the Steel S.S. "Nordlys" (Yard & Eng. No. 305) (Number of Volls 67)  
 Master W. Olsen Built at Copenhagen By whom built Akt. Burmeister & Wain Tons: Gross 3717.92  
 Engines made at Copenhagen By whom made Akt. Burmeister & Wain's Masking Skibbyggeri when made 1915-16  
 Boilers made at Copenhagen By whom made " when made 1915-16  
 Registered Horse Power 363.5 NHP. 1650 IHP. Owners Dampskibsselskabet "Norden" (P. Brown, Mgr.) Port belonging to Copenhagen  
 Nom. Horse Power as per Section 28 363.5 Is Refrigerating Machinery fitted for cargo purposes No. Is Electric Light fitted Yes.

**ENGINES, &c.**—Description of Engines Inverted triple expansion, surface condensing. No. of Cylinders 3 No. of Cranks 3  
 Dia. of Cylinders 28 1/2" x 42" x 70" Length of Stroke 45" Revs. per minute 65 Dia. of Screw shaft 14 3/4" Material of S.M.I. Steel  
 Is the screw shaft fitted with a continuous liner the whole length of the stern tube Yes Is the after end of the liner made water tight  
 in the propeller boss Yes If the liner is in more than one length are the joints burned one length 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 yes If two  
 liners are fitted, is the shaft lapped or protected between the liners ✓ Length of stern bush 6'-0"  
 Dia. of Tunnel shaft as per rule 12.58" Dia. of Crank shaft journals as per rule 13.2" Dia. of Crank pin 14" Size of Crank webs 10 x 25 1/4" Dia. of thrust shaft under  
 collars 14" Dia. of screw 17'-6" Pitch of Screw 16'-6" No. of Blades 4 State whether moveable No Total surface 96 sq. ft.  
 No. of Feed pumps 2 off Diameter of ditto 5 1/2" Stroke 14" Can one be overhauled while the other is at work yes.  
 No. of Bilge pumps 2 off Diameter of ditto 4 1/2" Stroke 22 1/2" Can one be overhauled while the other is at work yes.  
 No. of Donkey Engines 3 off Sizes of Pumps 7 1/2" x 10" x 1/2" - 6" x 4 1/2" x 10" No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room 3 off Starb. 2 off Port side each 3 1/2" In Boiler room 2 off each 3 1/2" In Holds, &c. In the fore holds and after holds 2 off in each 3 1/2" diam.  
 In tunnel well one 3 1/2" diam. In fore peak tank & after peak tank one in each 3" diam. All tank suction 3 1/2" diam.  
 No. of Bilge Injections one sizes 6" Connected to condenser, or to circulating pump Is a separate Donkey Suction fitted in Engine room & size one off 8" & 3 1/2"  
 Are all the bilge suction pipes fitted with roses yes Are the roses in Engine room always accessible yes Are the sluices on Engine room bulkheads always accessible none  
 Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks Valves except blow off cocks.  
 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 above.  
 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 The bilge suction pipes to the fore holds How are they protected By strong wood boxes.  
 Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times yes.  
 Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges yes.  
 Dates of examination of completion of fitting of Sea Connections 1<sup>st</sup> March 16 of Stern Tube 22<sup>nd</sup> March 16 Screw shaft and Propeller 4<sup>th</sup> April 1916  
 Is the Screw Shaft Tunnel watertight yes. Is it fitted with a watertight door yes worked from Upper deck grating

**BOILERS, &c.**—(Letter for record S.) Manufacturers of Steel Furnaces: Deiglmair, Patent and Tube Co. Ltd. Leeds. Hord & W.  
Tubes: Eisenbahn Werke 4/9 Friedenschmitt, -Hewitz, -Rivits: Hauge Bros. Copenhagen.  
 Total Heating Surface of Boilers 5700 sq. ft. Is Forced Draft fitted No. No. and Description of Boilers 3 off single ended Scotch type.  
 Working Pressure 180 lbs. per sq. in. Tested by hydraulic pressure to 360 lbs. per sq. in. Date of test 9<sup>th</sup> February 16 No. of Certificate 363, 364 & 365.  
 Can each boiler be worked separately yes Area of fire grate in each boiler 41.5 sq. ft. No. and Description of Safety Valves to  
 each boiler 2 off direct spring loaded Area of each valve 9.62 sq. in. Pressure to which they are adjusted 180 lbs. per sq. in. Are they fitted with easing gear yes.  
 Smallest distance between boilers or uptakes and bunkers or woodwork 2' 6" Mean dia. of boilers 13'-10 1/8" Length 11'-0" Material of shell plates S.M. Steel  
 Thickness 1 1/8" Range of tensile strength 28-32 Tons Are the shell plates welded or flanged No. Descrip. of riveting: cir. seams double riveted.  
 long. seams double riveted Diameter of rivet holes in long. seams 13/16" Pitch of rivets 8 3/8" Lap of plates or width of butt straps 17 13/16"  
 Per centages of strength of longitudinal joint 87.5 Working pressure of shell by rules 182 lbs. Size of manhole in shell 12" x 16"  
 Size of compensating ring 3 1/2" x 2 5/8" x 1 1/16" flanged No. and Description of Furnaces in each boiler corrugated sections. Material Steel Outside diameter 3'-7"  
 Length of plain part top 0" Thickness of plates bottom 9/16" Description of longitudinal joint welded No. of strengthening rings ✓  
 Working pressure of furnace by the rules 204 lbs. Combustion chamber plates: Material S.M. Steel Thickness: Sides 5/8" Back 5/8" Top 5/8" Bottom 3/4"  
 Pitch of stays to ditto: Sides 7 1/2" x 9" Back 7 1/2" x 9" Top 7 1/2" x 9" If stays are fitted with nuts or riveted heads riveted outside except Working pressure by rules 196.6 lbs.  
 Material of stays S.M. Steel Diameter at smallest part 1.384" Area supported by each stay 68.6 sq. in. Working pressure by rules 188.6 lbs. End plates in steam space  
 Material S.M. Steel Thickness 1" Pitch of stays 16" x 16" How are stays secured into nut in shell Working pressure by rules 185 lbs. Material of stays S.M. Steel  
 Diameter at smallest part 2.634" Area supported by each stay 256 sq. in. Working pressure by rules 221 lbs. Material of Front plates at bottom S.M. Steel  
 Thickness 1" Material of Lower back plate S.M. Steel Thickness 13/16" Greatest pitch of stays 16" x 16" Working pressure of plate by rules 198.5 lbs.  
 Diameter of tubes 3 1/4" Pitch of tubes 4 1/2" x 4 1/2" Material of tube plates S.M. Steel Thickness: Front 1" Back 13/16" Mean pitch of stays 11 1/4"  
 Pitch across wide water spaces 14" Working pressures by rules 230 lbs. Girders to Chamber tops: Material S.M. Steel Depth and  
 thickness of girder at centre 9 1/4" x 3 1/4" x 2" Length as per rule 2' 8 3/4" Distance apart 9" Number and pitch of stays in each 3 off 7 1/2"  
 Working pressure by rules 182 lbs. Superheater Steam chest; how connected to boiler by steam in steel tubes Can the superheater be shut off and the boiler worked  
 separately No. Diameter ✓ Length ✓ Thickness of shell plates ✓ Material ✓ Description of longitudinal joint ✓ Diam. of rivet  
 holes ✓ Pitch of rivets ✓ Working pressure of shell by rules ✓ Diameter of flue ✓ Material of flue plates ✓ Thickness ✓  
 If stiffened with rings ✓ Distance between rings ✓ Working pressure by rules ✓ End plates: Thickness ✓ How stayed ✓  
 Working pressure of end plates ✓ Area of safety valves to superheater each 0.77 sq. in. Are they fitted with easing gear yes.



IS A DONKEY BOILER FITTED?

No.

If so, is a report now forwarded?

SPARE GEAR.

State the articles supplied:-

1 cast iron propeller, 2 crank shafts, 1 screw shaft with nut, 1 set of springs for each piston, 1 set of coupling bolts & nuts, 2 main bearing bolts & nuts, 2 connecting rod top end bolts & nuts, 2 connecting rod bottom end bolts & nuts, 1 pair of cross head brasses, 1 pair of connecting rod brasses, 1 slide valve spindle, 1 air pump rod, 6 air pump valves, 2 feed pump valves & seats, 2 bilge pump valves, 36 condenser tubes & 100 screw ferrules, 2 valves for main feed check valves & 2 ditto for auxiliary feed check valves, 2 springs for boiler safety valves, 10 cylinder cover studs & nuts, 12 junkring screws, 24 boiler tubes, 24 water gauge glasses with packings, 1 set of fire bars for one boiler, 1 half set of valves for each donkey engine pump, a quantity of assorted bolts and nuts and iron of various sizes. For circulating pump: 1 set of main bearing brasses, 1 set of connecting top end and bottom end brasses, 1 roller & shaft, 1 piston rod, 1 slide valve spindle, 1 set of piston springs.

The foregoing is a correct description,

AKTIESELSKABET  
BURMEISTER & WAIN MASKIN- OG SKIBSBYGGERI

Manufacturer.

Dates of Survey while building { During progress of work in shops - - 18, 11, 14, 17, 22, 30 Oct. 2, 8, 9, 12, 16, 18, 20, 23, 25, 27, 29, 30 Nov. 2, 6, 8, 11, 16, 20, 21, 28, 30 Dec. 1915 5, 10, 13, 14, 18, 20, 22, 25, 29, 31 Jan. 2, 3, 8, 9, 14, 15, 22  
During erection on board vessel - - 29 Feb. 1, 9, 17 & 22 March 4, 7, 15, 17, 18, 19, 26 April 3, 10, 15, 18, 24 & 26 May 3, 7, 14, 17, 21, 22, 23 & 24 June 1916.  
Total No. of visits 69.

Is the approved plan of main boiler forwarded herewith

Yes.

Dates of Examination of principal parts - Cylinders 22/10, 5/11, 23/11, 6/12 2/11, 9/11, 2/12, 4/12, 15 14/10, 2/11, 23/11, 15 "donkey" 5/11, 23/11, 27/11, 9/12, 2/12, 4/12, 23/12, 15.  
Connecting rods 9/11, 2/12, 15 14/11, 25/11, 5/12, 14/12, 15 20/11, 27/11, 15 20/11, 25/11, 27/11 Covers 13/11, 27/11, 16 Pistons 4/12, 15 25/11, 16 Rods 4/3, 16.  
Stern tube 9/2, 29/2, 16. Steam pipes tested 22 Feb. 16. Engine and boiler seatings 4 & 15 April 16 Engines holding down bolts 10 May 1916.  
Completion of pumping arrangements 9 June 1916 Boilers fixed 3 May 1916. Engines tried under steam 14, 22, 24, 27 June 1916.  
Main boiler safety valves adjusted 17 June 1916 Thickness of adjusting washers No washers, - check nuts fitted.  
Material of Crank shaft S.M. Steel Identification Mark on Do. 12-15 A.P.P. Material of Thrust shaft S.M. Steel Identification Mark on Do. 1-16 A.P.P.  
Material of Tunnel shafts S.M. Steel Identification Marks on Do. R. No. 4876, 4877, 3-16 C.K. Material of Screw shafts S.M. Steel Identification Marks on Do. 1-16 C.K.  
Material of Steam Pipes Siemens Martin Steel (Lapwelded) 4869, 70 & 71 12-15 A.P.P. Test pressure 540 lbs. per sq. inch. R. No. 4843, 1-16 C.K.

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 duplicate of a previous case

No.

If so, state name of vessel

General Remarks

(State quality of workmanship, opinions as to class, &c. In accordance with the Rules for Special Survey, we

have examined the material and workmanship from the commencement of construction until the final trial under steam and found it good in every respect.

Schmidt's patent superheaters, constructed by Messrs. Burmeister & Wain, have been fitted to the boilers and the finished apparatus have been tested by hydraulic pressure to 540 lbs per square inch and found good.

The dimensions are as specified and in accordance with the Rules, - the approved plans and letters E dated the 26<sup>th</sup> January, 10<sup>th</sup> & 18<sup>th</sup> March, 18<sup>th</sup> May and 15<sup>th</sup> July 1915.

The material used in the construction has been tested as required by the Rules, or as per letter S dated the 11<sup>th</sup> February 1915.

On the trial trip the engines and boilers worked satisfactorily.

Recommend the vessel's machinery to have notation of LMC - 6.16.

It is submitted that  
this vessel is eligible for  
THE RECORD, + LMC 6.16.

The amount of Entry Fee ... £1. 52. 41 :  
Special ... £1. 667. 35 :  
Donkey Boiler Fee ... £1. 87. 35 :  
Travelling Expenses (if any) £ :  
When applied for, 6. 10. 1916  
Then received, 6. 10. 1916

Committee's Minute

TUE. 27. MAR. 1917

Assigned

+ L.M.C. 6.16

MACHINERY CERTIFICATE  
WRITTEN



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