No. 2340

1929
S.E.

THE BRITISH CORPORATION FOR THE SURVEY

AND

REGISTRY OF SHIPPING.

JOHANNA W. VINKE

Report No. 2314 No. in Register Book 3413

"Neofold 1" NEBULA

S.S. "NORRØNA"

Makers of Engines Smiths Dock Co Ld.

Works No. 374.

Makers of Main Boilers Hawthorn Leslie & Co Ld

Works No. 9262.

Makers of Donkey Boiler –

Works No. –

MACHINERY.

14 002249-002259-0024

No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. ..... No. in Register Book .....

Received at Head Office 19th March 1930.

Surveyor's Report on the New Engines, Boilers, and Auxiliary Machinery of the ~~Single~~ ~~Triple~~ ~~Twin~~ ~~Quadruple~~ Screw Whaler "Harpona"

Official No. Port of Registry Sandefjord

Registered Owners Hvalfangeraktieselskabet "Vestfold"

Engines Built by Smiths Dock Co Ltd.

at South Bank-on-Tees

Main Boilers Built by R. & W. Hawthorn Leslie & Co Ltd.

at Forth Bank Wks, Newcastle-on-Tyne.

Donkey " " –

at –

Date of Completion 9-29.

First Visit 8-7-29 Last Visit 27-9-29 Total Visits 35

12

RECIPROCATING ENGINES.

Works No. 374 No. of Sets 1 Description Triple expansion. S.C. Berks.

No. of Cylinders each Engine 3 No. of Cranks 3 "

Diars. of Cylinders 16" - 26¼" - 44½" Stroke 26

Cubic feet in each L.P. Cylinder 23.4

Are Spring-loaded Relief Valves fitted to Top and Bottom of each Cylr.?

" " each Receiver ?

Type of H.P. Valves,

1st I.P. "

2nd I.P. "

L.P. "

" Valve Gear

" Condenser Cooling Surface sq. ft.

Diameter of Piston Rods (plain part) Screwed part (bottom of thread)

Material "

Diar. of Connecting Rods (smallest part) Material

" Crosshead Gudgeons " Length of Bearing Material

No. of Crosshead Bolts (each) Diar. over Thrds. Thrds. per inch Material

" Crank Pin " " " " "

" Main Bearings Lengths

" Bolts in each Diar. over Thread Threads per inch Material

" Holding Down Bolts each Engine Diar. No. of Metal Chocks

Are the Engines bolted to the Tank Top or to a Built Seat ?

Are the Bolts tapped through the Tank Top and fitted with Nuts Inside ?

If not, how are they fitted ?

same as Mr. Carthers

Connecting Rods, Forged by Brown Bros.

Piston " " "

Crossheads, " "

Connecting Rods, Finished by Cunliffe & Co.

Piston " " "

Crossheads, " "

Date of Harbour Trial 25-9-29

" Trial Trip 27-9-29

Trials run at In North Sea.

Were the Engines tested to full power under Sea-going conditions ? Yes.

If so, what was the I.H.P.? 1600 Revols. per min. 178

Pressure in 1st I.P. Receiver, 74 lbs., 2nd I.P., lbs., L.P., 11 lbs., Vacuum, 25 ins.

Speed on Trial 14 knots.

If the Conditions on Trial were such that full power records were not obtained give the following estimated data:—

Builders' estimated I.H.P Revols. per min.

Estimated Speed

TURBINE ENGINES.

Works No. Type of Turbines

No. of H.P. Turbines No. of I.P. No. of L.P. No. of Astern

Are the Propeller Shafts driven direct by the Turbines or through Gearing?

Is Single or Double Reduction Gear employed?

Diar. of 1st Reduction Pinion } Width Pitch of Teeth

" 1st " Wheel

Estimated Pressure per lineal inch

Diar. of 2nd Reduction Pinion } Width Pitch of Teeth

" 2nd " Wheel

Estimated Pressure per lineal inch

Revols. per min. of H.P. Turbines at Full Power S.H.P.

" " I.P. " "

" " L.P. " "

" " 1st Reduction Shaft

" " 2nd "

" " Propeller Shaft

Total Shaft Horse Power

Date of Harbour Trial

" Trial Trip

Trials run at

Speed on Trial Knots. Propeller Revols. per min. S.H.P.

Turbine Spindles forged by

" Wheels forged or cast by

Reduction Gear Shafts forged by

" Wheels forged or cast by

DESCRIPTION OF INSTALLATION.

TURBO-ELECTRIC PROPELLING MACHINERY.

No. of Turbo-Generating Sets Capacity of each

Type of Turbines employed

Description of Generators

No. of Motors driving Propeller Shafting

Are the Propeller Shafts driven direct by the Motors or through Gearing?

Is Single or Double Reduction Gear employed?

Description of Motors

Diar. of 1st Reduction Pinion } Width Pitch of Teeth
" 1st " Wheel

Estimated Pressure per lineal inch

Diar. of 2nd Reduction Pinion } Width Pitch of Teeth
" 2nd " Wheel

Estimated Pressure per lineal inch

Revols. per min. of Generators at Full Power

" " Motors "

" " 1st Reduction Shaft

" " 2nd "

" " Propellers at Full Power

Total Shaft Horse Power

Date of Harbour Trial

" Trial Trip

Trials run at

Speed on Trial Knots. Propeller Revols. per min. S.H.P.

Makers of Turbines

" Generators

" Motors

" Reduction Gear

Turbine Spindles forged by

" Wheels forged or cast by

Reduction Gear Shafts forged by

" Wheels forged or cast by

DESCRIPTION OF INSTALLATION.

SHAFTING.

Are the Crank Shafts Built or Solid ?

No. of Lengths in each — Angle of Cranks

Diar. by Rule — Actual 8 5/8" — In Way of Webs

„ of Crank Pins — Length between Webs

Greatest Width of Crank Webs — Thickness

Least „ „ — „

Diar. of Keys in Crank Webs — Length

„ Dowels in Crank Pins — Length — Screwed or Plain

No. of Bolts each Coupling — Diar. at Mid Length — Diar. of Pitch Circle

Greatest Distance from Edge of Main Bearing to Crank Web

Type of Thrust Blocks

No. „ Rings

Diar. of Thrust Shafts at bottom of Collars 8 5/8" — No. of Collars

„ „ Forward Coupling — At Aft Coupling

Same as Ch. Cylinders

Diar. of Intermediate Shafting by Rule — Actual 8 5/8" — No. of Lengths

No. of Bolts, each Coupling — Diar. at Mid Length — Diar. of Pitch Circle

Diar. of Propeller Shafts by Rule — Actual 9" — At Couplings

Are Propeller Shafts fitted with Continuous Brass Liners ?

Diar. over Liners — Length of After Bearings

Of what Material are the After Bearings composed ?

Are Means provided for lubricating the After Bearings with Oil ?

„ „ to prevent Sea Water entering the Stern Tubes ?

If so, what Type is adopted ?

SKETCH OF CRANK SHAFT.

No. of Blades each Propeller 4 Fitted or Solid? solid.

Material of Blades C.S. Boss C.S.

Diar. of Propellers 9'-9" Pitch 9'-6" Surface (each 41 S. ft.)

Coefficient of Displacement of Vessel at ⅔ Moulded Depth

Crank Shafts Forged by Darlington Forge Co. Material S.S.

,, Pins ,, ,, ,, ,,

,, Webs ,, ,, ,, ,,

Thrust Shafts ,, ,, ,, ,,

Intermed. ,, ,, ,, ,, ,,

Propeller ,, ,, ,, ,, ,,

@

Crank ,, Finished by ,,

Thrust ,, ,, ,,

Intermed. ,, ,, ,,

Propeller ,, ,, ,,

STAMP MARKS ON SHAFTS.

Crank, Thrust
Intermediate
& Tail Shafts:—

B.C.
N°1004
26-8-29
G.H.B.

SKETCH OF PROPELLER SHAFT.

PUMPS, ETC.

No. of Air Pumps Diar. Stroke

Worked by Main or Independent Engines?

No. of Circulating Pumps Diar. Stroke

Type of ,,

Diar. of ,, Suction from Sea

Has each Pump a Bilge Suction with Non-return Valve? Diar.

What other Pumps can circulate through Condenser?

No. of Feed Pumps on Main Engine Diar. Stroke

Are Spring-loaded Relief Valves fitted to each Pump?

Can one Pump be overhauled while the others are at work?

No. of Independent Feed Pumps Diar. Stroke

What other Pumps can feed the Boilers?

No. of Bilge Pumps on Main Engine Diar. Stroke

Can one Pump be overhauled while the others are at work?

No. of Independent Bilge Pumps

What other Pumps can draw from the Bilges?

Are all Bilge Suctions fitted with Rose's?

Are the Valves, etc., so arranged as to prevent unintentional connection between Sea and Bilges?

Are all Sea Connections made with Valves or Cocks next the Ship's sides?

Are they placed so as to be easily accessible?

Are the Discharge Chests placed above or below the Deep Load Line?

Are they fitted direct to the Hull Plating and easily accessible?

Are all Blow-off Cocks or Valves fitted with Spigots through the Hull Plating and Covering Plates or Flanges on the Outside?

BOILERS

Works No. 9262.

No. of Boilers One. Type "Hawthorn" - Armstrong Water-Tube.

Single or Double-ended Single ended.

No. of Furnaces in each One.

Type of Furnaces ✓

Date when Plan approved 12.2.29.

Approved Working Pressure 210.

Hydraulic Test Pressure 365.

Date of Hydraulic Test 11.6.29

" when Safety Valves set 25-9-29

Pressure at which Valves were set 216 lbs.

Date of Accumulation Test 25-9-29

Maximum Pressure under Accumulation Test 216 lbs.

System of Draught C.A.

Can Boilers be worked separately? ✓

Makers of Plates Colville & Sons, Glasgow.

" Stay Bars " none. "

" Rivets Rivet, Bolt & Nut Coy.

" Furnaces ✓ none.

Greatest Internal Diar. of Boilers Upper Steam drum 50"

" " Length " " " " 5'-4 23/32"

Square Feet of Heating Surface each Boiler 3400 ft

" " Grate " " oil burner

No. of Safety Valves each Boiler One double Rule Diar. Actual 2 3/4"

Are the Safety Valves fitted with Easing Gear? Yes.

No. of Pressure Gauges, each Boiler One. No. of Water Gauges 2. One on each steam-drum

" Test Cocks " None. " Salinometer Cocks One.

BC. TEST.
No. 4811.
365 lbs □"
210 - -
J.L.
11. 6. 29

Butts 9'-

4 Breadth 8" 2

Tubes by Weldless Steel Tube Coy, Wednesfield.
Neck pieces by Barr, Thompson, Kilmarnock

On Pillars.

Are the Water Gauges fitted direct to the Boiler Shells or mounted on Pillars? ~~Direct~~

Are the Water Gauge Pillars fitted direct to the Boiler Shells or connected by Pipes? Direct.

Are these Pipes connected to Boilers by Cocks or Valves? ✓

Are Blow-off Cocks or Valves fitted on Boiler Shells?

No. of Strakes of Shell Plating in each Boiler Upper ~~Steam~~ ~~dome~~ One plate.

" Plates in each Strake ✓

Thickness of Shell Plates Approved $\frac{5}{8}$"

" " in Boilers $\frac{5}{8}$"

Are the Rivets Iron or Steel? Steel

Are the Longitudinal Seams Butt or Lap Joints? Butt.

Are the Butt Straps Single or Double? Double.

Are the Double Butt Straps of equal width? $8\frac{15}{16}$"

Thickness of outside Butt Straps $\frac{1}{2}$"

" inside " $\frac{1}{2}$"

Are Longitudinal Seams Hand or Machine Riveted? Hand.

Are they Single, Double, or Treble Riveted? Double.

No. of Rivets in a Pitch Two.

Diar. of Rivet Holes $\frac{29}{32}$" Pitch 3·61"

No. of Rows of Rivets in Centre Circumferential Seams ✓

Are these Seams Hand or Machine Riveted? ✓

Diar. of Rivet Holes Pitch ✓

No. of Rows of Rivets in Front End Circumferential Seams Two.

Are these Seams Hand or Machine riveted? Hand.

Diar. of Rivet Holes $\frac{29}{32}$" Pitch 2·62"

No. of Rows of Rivets in Back End Circumferential Seams Two.

Are these Seams Hand or Machine Riveted? Hand

Diar. of Rivet Holes $\frac{29}{32}$" Pitch 2·62"

Size of Manholes in Shell 16" x 12".

Dimensions of Compensating Rings Flanged.

2 Steam drums and 2 water-pockets - 2 plates (Wrapper and tube plates). wrapper plates $\frac{9}{16}$", tube plates $1\frac{1}{2}$"

Thickness of End Plates in Steam Space Approved 1" in manhole end, 7/8" at other end

" " " " " in Boilers 1" " " , 7/8 " " "

Pitch of Steam Space Stays None.

Diar. " " " " Approved ✓ Threads per Inch ✓

" " " " " in Boilers ✓ " ✓

Material of " " " ✓

How are Stays Secured? ✓

Diar. and Thickness of Loose Washers on End Plates ✓

" " Riveted " " ✓

Width " " Doubling Strips " ✓

Thickness of Middle Back End Plates Approved ✓

" " " " " in Boilers ✓

Thickness of Doublings in Wide Spaces between Fireboxes ✓

Pitch of Stays at " " " " ✓

Diar. of Stays Approved Threads per Inch ✓

" " in Boilers " ✓

Material " ✓

Are Stays fitted with Nuts outside? ✓

Thickness of ~~Back~~ End Plates at ~~Bottom~~ Approved Steam drums & Water pockets

" " " " " in Boilers " " " "

Pitch of Stays at Wide Spaces between Fireboxes ✓

Thickness of Doublings in " " ✓

Thickness of Front End Plates at Bottom Approved ✓

" " " " " in Boilers ✓

No. of Longitudinal Stays in Spaces between Furnaces ✓

25/32" at manhole end, 21/32" at other end.

" " " , " "

Diar. of Stays Approved Threads per Inch

" " in Boilers

Material "

Thickness of ~~Front~~ Tube Plates Approved In steam drums and water pockets 1½"

" " " " in Boilers ✓ ✓ ✓ ✓ ✓ ✓ ✓

Pitch of Stay Tubes at Spaces between Stacks of Tubes ✓

Thickness of Doublings in " " " ✓

" Stay Tubes at " " " ✓

Are Stay Tubes fitted with Nuts at Front End ✓

Thickness of Back Tube Plates Approved ✓

" " " in Boilers ✓

Pitch of Stay Tubes in Back Tube Plates ✓

" Plain " ✓

Thickness of ~~Stay~~ Tubes Downcomer tubes No 10. W.G.

" Plain " Generating tubes No 10 near flames, No 11 remainder.

External Diar. of Tubes Downcomer 2". remainder 1⅜".

Material " Solid drawn tubes.

Thickness of Furnace Plates Approved ✓

" " " in Boilers ✓

Smallest outside Diar. of Furnaces ✓

Length between Tube Plates 9'- 1 1/16" between steam drums and waterpockets.

Width of Combustion Chambers (Front to Back) ✓

Thickness of " " Tops Approved ✓

" " " in Boilers ✓

Pitch of Screwed Stays in C.C. Tops ✓

Diar. of Screwed Stays Approved ✓ Threads per Inch

" " " in Boilers ✓

Material " " ✓

Thickness of Combustion Chamber Sides Approved ✓

" " " " in Boilers ✓

Pitch of Screwed Stays in C.C. Sides ✓

Diar. " " Approved ✓ Threads per Inch

" " " in Boilers ✓

Material " " ✓

Thickness of Combustion Chamber Backs Approved ✓

" " " " in Boilers ✓

Pitch of Screwed Stays in C.C. Backs ✓

Diar. " " Approved ✓ Threads per Inch

" " " in Boilers ✓

Material " " ✓

Are all Screwed Stays fitted with Nuts inside C.C.? ✓

Thickness of Combustion Chamber Bottoms ✓

No. of Girders over each Wing Chamber ✓

" " " Centre " ✓

Depth and Thickness of Girders ✓

Material of Girders ✓

No. of Stays in each ✓

No. of Tubes, each Boiler 1040 Generating tubes, 226 downcomers.

Size of Lower Manholes 16"x12"

VERTICAL DONKEY BOILERS.

No. of Boilers Type

Greatest Int. Diar. Height

Height of Boiler Crown above Fire Grate

Are Boiler Crowns Flat or Dished ?

Internal Radius of Dished Ends Thickness of Plates

Description of Seams in Boiler Crowns

Diar. of Rivet Holes Pitch Width of Overlap

Height of Firebox Crowns above Fire Grate

Are Firebox Crowns Flat or Dished ?

External Radius of Dished Crowns Thickness of Plates

No. of Crown Stays Diar. Material

External Diar. of Firebox at Top Bottom Thickness of Plates

No. of Water Tubes Ext. Diar. Thickness

Material of Water Tubes

Size of Manhole in Shell

Dimensions of Compensating Ring

Heating Surface, each Boiler Grate Surface

SUPERHEATERS.

Description of Superheaters Note! The superheaters on plan not fitted to this Boiler, as arranged originally.

Where situated ? Superheaters now fitted into similar boiler No. 9316 built later.

Which Boilers are connected to Superheaters ?

Can Superheaters be shut off while Boilers are working ?

No. of Safety Valves on each Superheater Diar.

Are " " fitted with Easing Gear ?

Date of Hydraulic Test Test Pressure

Date when Safety Valves set Pressure on Valves

MAIN STEAM PIPES.

No. of Lengths	2			
Material	copper.			
Brazed, Welded or Seamless	S.D.			
Internal Diar.	5"			
Thickness	3/16 W.G.			
How are Flanges secured?	brazed.			
Date of Hydraulic Test	20-9-29			
Test Pressure	420 lbs.			
No. of Lengths				
Material				
Brazed, Welded or Seamless				
Internal Diar.				
Thickness				
How are Flanges secured?				
Date of Hydraulic Test				
Test Pressure				
No. of Lengths				
Material				
Brazed, Welded or Seamless				
Internal Diar.				
Thickness				
How are Flanges secured?				
Date of Hydraulic Test				
Test Pressure				

EVAPORATORS.

No. 1 Type Weir's 10 Tons per Day

Makers G. & J. Weir

Working Pressure 15 lbs. Test Pressure 50 Date of Test

Date of Test of Safety Valves under Steam 25-9-29

FEED WATER HEATERS.

No. 1 Type Exhaust Steam

Makers Caird & Raymond

Working Pressure 210 lbs Test Pressure Date of Test

FEED WATER FILTERS.

No. 1 Type Gravitation Type. Size

Makers Smith's D. & C.

Working Pressure Test Pressure Date of Test

LIST OF DONKEY PUMPS.

Same as "Chr. Castberg"

SPARE GEAR.

No of Top End Bolts.	No. of Bot. End Bolts.	No. of Cylinder Cover Studs
„ Coupling Bolts	„ Main Bearing Bolts	„ Valve Chest „
„ Junk Ring Bolts	„ Feed Pump Valves	„ Bilge Pump Valves
„ H.P. Piston Rings	„ I.P. Piston Rings	„ L.P. Piston Rings
„ „ Springs	„ „ Springs	„ „ Springs
„ Safety Valve „	„ Fire Bars	„ Feed Check Valves
„ Piston Rods	„ Connecting Rods	„ Valve Spindles
„ Air Pump Rods	„ Air Pump Buckets	„ Air Pump Valves
„ Cir. „	Cir. „	Cir. „
„ Crank Shafts	„ Crank Pin Bushes	„ Crosshead Bushes
„ Propeller Shafts	„ Propellers	„ Propeller Blades
„ Boiler Tubes	„ Condenser Tubes	„ Condenser Ferrules

OTHER ARTICLES OF SPARE GEAR:—

REFRIGERATORS.

No. of Machines Capacity of each

Makers

Description

No. of Steam Cylinders, each Machine No. of Compressors No. of Cranks

Particulars of Pumps in connection with Refrigerating Plant and whether worked by Refrigerating Machines or Independently

System of Refrigeration

,, Insulation

Are Brine and other Regulating Valves placed so as to be accessible without entering the Insulated Spaces?

Are all Pipes, Air Trunks, &c., well secured and protected from risk of damage?

Are all Bilge, Sounding and Air Pipes in Insulated Spaces properly insulated?

Are Thermometer Tubes so arranged that Water cannot enter and freeze in them?

Date of Test under Working Conditions

RESULTS OF TRIALS.

COMPARTMENT.	Temp. at beginning of Trial.	Temp. at end of Trial.	Time required to obtain this Result.	Rise of Temp. after hours.

Articles of Spare Gear for Refrigerating Plant carried on board:—

ELECTRIC LIGHTING.

Installation Fitted by R. Pickersgill & Sons.

No. and Description of Dynamos 1 compound wound.

Makers of Dynamos Cumberland Forge Mach. Co. Ld.

Capacity " 55 Amperes, at 110 Volts, 350 Revols. per Min.

Current Alternating or Continuous

Single or Double Wire System

Position of Dynamos "

" Main Switch Board

No. of Circuits to which Switches are provided on Main Switch Board

Particulars of these Circuits:—

Circuit.	Number of Lights.	Candle Power.	Current Required. Amps.	Size of Conductor.	Current Density.	Conductivity of Conductor.	Insulation Resistance per Mile.
		"					

Same as chr. Cathing

Total No. of Lights No. of Motors driving Fans, &c. No. of Heaters

Current required for Motors and Heaters

Positions of Auxiliary Switch Boards, with No. of Switches on each

Are Cut-outs fitted as follows?—

On Main Switch Board, to Cables of Main Circuits

On Aux. „ „ each Auxiliary Circuit

Wherever a Cable is reduced in size

To each Lamp Circuit

To both Flow and Return Wires of all Circuits when the Double-Wire System is adopted

Are the Fuses of Standard Sizes?

Are all Switches and Cut-outs constructed of Non-inflammable Material?

Are they placed so as to be always and easily accessible?

Smallest Single Wire used, No. S.W.G., Largest, No. S.W.G.

How are Conductors in Engine and Boiler Spaces protected?

„ „ Saloons, State Rooms, &c., „ ?

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp

(2) „ passing through Bunkers or Cargo Spaces

(3) „ „ Deck Beams or Bulkheads

Are all Joints in Cables properly soldered and thoroughly Insulated so that the efficiency of the Cables is unimpaired?

Are all Joints in accessible positions, none being made in Bunkers or Cargo Spaces?

Are all Hull Connections for Single-Wire Systems made with Screws of large Surface?

Are the Dynamos, Motors, Main and Branch Cables, so placed that the Compasses are not injuriously affected by them?

Have Tests been made to prove that this condition has been satisfactorily fulfilled?

Has the Insulation Resistance over the whole system been tested?

What does the Resistance amount to? Ohms.

Is the Installation supplied with a Voltmeter?

„ „ „ an Ampere Meter

Date of Trial of complete Installation 27-9-29. Duration of Trial 6 hours.

Have all the requirements of Section 42 been satisfactorily carried out? yes.

GENERAL CONSTRUCTION.

Have the Machinery and Boilers been constructed in accordance with the requirements of the Rules and the Approved Plans? yes.

If not, give details of the points of difference, and state when these were sanctioned by the Chief Surveyor.

Are the Materials used in the Construction of Engines and Boilers, so far as could be seen, sound and trustworthy yes.

Is the Workmanship throughout thoroughly satisfactory? yes.

The above correctly describes the Machinery of the S.S. "NORRØNA" as ascertained by us ~~me~~ from personal examination

J. D. Stephenson
John Lundgren
Engineer Surveyor ~~to the British~~ Corporation for the Survey and Registry of Shipping.

Fees—

			£	s.	d.
MAIN BOILERS.					
H.S. 3400	Sq. ft.			:	:
G.S. —	"			:	:
DONKEY BOILERS.					
H.S. —	Sq. ft.			:	:
G.S. —	"			:	:
		£		:	:
ENGINES.					
L.P.C. 23·4	Cub. ft.			:	:
		£		:	:
Testing, &c.				:	:
		£		:	:
Expenses				:	:
Total ...		£		:	:

It is submitted that this Report be approved,

J. Foster King
Chief Surveyor.

Approved by the Committee for the Class of M.B.S.* on the 2nd April 1930.

Fees advised

Fees paid

J. Lumsden
Secretary.