Rpt. 4a.

REPORT ON MACHINERY. No. 6736.

Date of writing Report 10th Novr 1921 When handed in at Local Office 19 Port of Copenhagen

Received at London Office WED. 16 NOV. 1921

No. in Reg. Book. 39262 Survey held at Copenhagen Date, First Survey 16th June 1920 Last Survey 27th October 1921. (Number of Visits 42)

on the STEEL Sc. Sr. "STAL" (o/s Baltica Værft yard No 2) Tons Gross 2274.13 Net 1311.13

Master Built at Copenhagen By whom built Akt. Baltica Værft. When built 1921

Engines made at Finspong By whom made Svenska Turbinfabriks Aktiebolaget Ljungström when made 1921.

Boilers made at Copenhagen By whom made Akt. Kjöbenhavns Flydedok og Skibsværft. when made 1921.

Registered Horse Power 221 N.H.P. Owners M/s D/s Store Bælt Port belonging to Copenhagen.

Shaft Horse Power at Full Power 1150. Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes.

TURBINE ENGINES, &c.—Description of Engines Geared Steam Turbine No. of Turbines One.

Diameter of Rotor Shaft Journals, H.P. L.P. Diameter of Pinion Shaft 2048.

Diameter of Journals Distance between Centres of Bearings Diameter of Pitch Circle

Diameter of Wheel Shaft See Stockholm Report No 2048. Diameter of Pitch Circle of Wheel

Width of Face Diameter of Thrust Shaft under Collars 273.79 m/m = 10 3/4" Diameter of Tunnel Shaft as per rule 9.94" 9.73

No. of Screw Shafts one. Diameter of same as per rule 11.84" 12.31" no liners (see Chr letter 19/12/21) as fitted 10 1/4"

as fitted 12 7/8" Diameter of Propeller 15'-6" Pitch of Propeller 14'-9 1/4"

No. of Blades 4. State whether Moveable No. Total Surface 42.8 0'. Diameter of Rotor Drum, H.P. L.P. astern

Thickness at Bottom of Groove, H.P. L.P. Astern Revs. per Minute at Full Power, Turbine Propeller

PARTICULARS OF BLADING.

	H.P. HEIGHT OF BLADES.	H.P. DIAMETER AT TIP.	H.P. NO. OF ROWS.	L.P. HEIGHT OF BLADES.	L.P. DIAMETER AT TIP.	L.P. NO. OF ROWS.	ASTERN. HEIGHT OF BLADES.	ASTERN. DIAMETER AT TIP.	ASTERN. NO. OF ROWS.
1ST EXPANSION									
2ND "									
3RD "									
4TH "									
5TH "									
6TH "									
7TH "									
8TH "									

See Stockholm Report No 2048.

No. and size of Feed pumps 1 off, Weir's simplex, 9½" × 7" × 18". 1 do donkey fees pump. 2 Ballast pumps 315 × 210 × 380 m/m duplex.

No. and size of Bilge pumps 2 off, 5½" dia. × 5" stroke, plunger. 100 Revs./Min. 1 do. for sanitary purposes.

No. and size of Bilge suctions in Engine Room 3 off 3" connected to bilge pumps; 1 off 3" connected to ballast pump.

In Holds &c. No. 1 Hold: 2 off 3"; No. 2 Hold: 2 off 3"; Tunnel: 1 off 3". F.P. tank: 1 off 3"; No 1 tank: 2 off 3½"; No 2 do: 4 off 3½"; No 3 do: 4 off 3"; No 5 do: 4 off 3"; No 6 do: 2 off 3"; A.P. tank: 2 off 3"

No. of Bilge Injections one sizes 7" Connected to condenser, or to circulating pump Circul. Is a separate Donkey Suction fitted in Engine Room & size yes 3" connected to ballast pump

Are all the bilge suction pipes fitted with roses yes. Are the roses in Engine room always accessible yes.

Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks valves except blow off cock.

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 None. How are they protected

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.

Is the Screw Shaft Tunnel watertight yes. Is it fitted with a watertight door yes. worked from upper platform.

BOILERS, &c.—(Letter for record S.) Manufacturers of Steel STAY BARS: THE LANARKSHIRE STEEL Co. MOTHERWELL. PLATES & FURNACES: W. BEARDMORE & Co. LD. PARKHEAD FORGE ROLLER MILLS. TUBES: THE CHESTERFIELD TUBE CO. LD.

Total Heating Surface of Boilers 2740 0' Is Forced Draft fitted yes No. and Description of Boilers 2 off, single ended, return tubular

Working Pressure 200 lbs. per 0" Tested by hydraulic pressure to 400 lbs. per 0" Date of test 16/3 21. No. of Certificate 415 & 416.

Can each boiler be worked separately yes Area of fire grate in each boiler 30.33 0' No. and Description of Safety Valves to each boiler 2 off, direct spring loaded. Area of each valve 5.94 0" Pressure to which they are adjusted 200 lbs. per 0" Are they fitted with easing gear yes

Smallest distance between ~~boilers or~~ uptakes and bunkers ~~or woodwork~~ 13½" Mean dia. of boilers 11'-9" Length 11'-3" Material of shell plates S.M. Steel.

Thickness 1 1/16" + 1/32" Range of tensile strength 28-32 tons per 0" Are the shell plates welded or flanged No Descrip. of riveting: cir. seams lap joint, 2 rivets long. seams 2 butt straps, 3 rivets. Diameter of rivet holes in long. seams 1 1/16" + 1/32" Pitch of rivets 7 1/16" ~~Lap of plates or~~ width of butt straps 12" 15¼"

Per centages of strength of longitudinal joint rivets 83.1 plates 85.77 Working pressure of shell by rules 200.98 lbs. Size of manhole in shell 12" × 16"

Size of compensating ring 31½" × 2½" × 1 3/32" No. and Description of Furnaces in each Boiler 2 off, corrugated DEIGHTONS TYPE Material S.M. mild steel Outside diameter 3'-10 1/4"

Length of plain part top bottom Thickness of plates crown 5/8" bottom Description of longitudinal joint welded. No. of strengthening rings

Working pressure of furnace by the rules 217.8 lbs. Combustion chamber plates: Material S.M. Steel. Thickness: Sides 11/16" + 1/32" Back 11/16" + 1/32" Top 11/16" Bottom 3/4"

Pitch of stays to ditto: Sides 10" × 8 3/4" Back 9 7/8" × 8½" Top 8 3/8" × 9½" If stays are fitted with nuts or riveted heads nuts inside, rivet heads outside Working pressure by rules S: 202.2 lbs. B: 210.3 " " T: 211 " "

Material of stays S.M. Steel. Diameter at smallest part 2.634" Area supported by each stay 92.97 0" Working pressure by rules 203 lbs. End plates in steam space

Material S.M. Steel. Thickness 1" Pitch of stays 18" × 15" How are stays secured screwed in both plates, riveted Working pressure by rules 205.2 lbs. Material of stays S.M. Steel.

Diameter at smallest part 2.634" Area supported by each stay 24 0" Working pressure by rules 210.1 lbs. Material of Front plates at bottom S.M. steel.

Thickness 15/16" Material of Lower back plate S.M. steel. Thickness 7/8" + 1/32" Greatest pitch of stays 9 7/8" × 8½" Working pressure of plate by rules 247.7 lbs.

Diameter of tubes 3½" Pitch of tubes 4 3/4" × 4 5/8" Material of tube plates S.M. Steel. Thickness: Front 15/16" Back 7/8" + 1/32" Mean pitch of stays 11 3/4"

Pitch across wide water spaces 14½" Working pressures by rules FRONT TUBE PLATE: 228 lbs. BACK " " : 213 " " WIDE WATER SPACE : 228 " " Girders to Chamber tops: Material S.M. Steel. Depth and thickness of girder at centre 8 3/8" × 5/8" × 2. Length as per rule 25 5/8" Distance apart 9½" Number and pitch of stays in each 2 off 8 3/8"

Working pressure by rules 206 lbs. Steam dome: description of joint to shell % of strength of joint Diameter

Thickness of shell plates Material Description of longitudinal joint Diameter of rivet holes Pitch of rivets

Working pressure of shell by rules Crown plates: Thickness How stayed

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SUPERHEATER. Type Schmidt's patent. Date of Approval of Plan 24th August 1920. Tested by Hydraulic Pressure to 600 lbs. per □"

Date of Test 23rd November 1920. Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler yes.

Diameter of Safety Valve 32 m/m = 1¼" Pressure to which each is adjusted 200 lbs. per □" Is Easing Gear fitted yes.

IS A DONKEY BOILER FITTED? No. If so, is a report now forwarded?

SPARE GEAR. State the articles supplied:— 1 Propeller shaft & 1 propeller, 1 inner turbine bearing complete with white metal bush and bolts with nuts, 1 intermediate 2 other do. &c., 1 bush for intermediate spur wheel, 4 bearings complete with white metal bush and bolts with nuts for 1st gear wheel shaft, 2 do. for pinion shafts and 1 do. for 2nd gear wheel shafts. 1 set of pads for Mitchell's thrust block, 1 set of pads for axial bearing for turbine, 1 set of shaft packings for turbine, 1 screw wheel for turbine lubricating oil pump, 4 oil filters for gear casing & 5 do. for turbine casing, 2 rotors, 1 impeller, 1 shaft and 2 shaft bushes for the pump for condensed water, 2 bushes for the cinetic pump, 2 bushes for the circulating pump, 25 condenser tubes, 50 screw ferrules, 8 tubes for the economiser, 20 tubes for oil coolers, 12 tubes and 24 screw ferrules for auxiliary condenser, 6 boiler tubes, fire bars for 2 furnaces, 1 set coupling bolts, 2 safety valve springs for boilers, 1 do. for air preheaters, 1 set fuel check valves, 1 set valves for fuel pump, donkey fuel pump, bilge & sanitary pumps and vapour lubricating oil pump. Bolts, screws & spindles &c &c as per accompanying list. and a quantity of bars and plates of iron and mild steel.

The foregoing is a correct description,

AKTIESELSKABET KJØBENHAVNS FLYDEDOK OG SKIBSVÆRFT Manufacturer.

Ove Munck

Dates of Survey while building — During progress of work in shops: 16/6 - 22/6 - 2/7 - 5/7 - 9/7 - 13/7 - 15/7 - 17/7 - 2/11 20; 3/1 - 3/1 - 10/1 - 14/1 - 20/1 - 24/1 - 26/1 - 29/1 - 5/2 - 9/2 - 15/2 - 16/3 21.

During erection on board vessel: 9/2 - 15/2 - 14/2 - 26/7 - 2/8 - 5/8 - 16/8 - 23/8 - 25/8 - 30/8 - 31/8 - 8/9 - 10/9 - 13/9 - 22/9 - 29/9 - 7/10 - 14/10 - 21/10 - 22/10 - 27/10 21.

Total No. of visits 42. Is the approved plan of main boiler forwarded herewith yes. ✓

" " " donkey " " "

Dates of Examination of principal parts—Casings ✓ Rotors ✓ Blading ✓ Gearing ✓

Rotor shaft ✓ Thrust shaft 16/6 - 2/7 20; 25/1 21 Tunnel shafts 22/6 - 2/7 - 5/7 - 13/7 20; 25/1 21 Screw shaft 5-9-15-17/7 20; 26/1 21 Propeller 2/8 21.

Stern tube 2/11 20, 26/7 21. Steam pipes tested 31/8 - 22/9 21. Engine and boiler seatings 2/8 21. Engines holding down bolts 22/9 21.

Completion of pumping arrangements 25/8 21 Boilers fixed 17/8 - 23/8 21. Engines tried under steam 14/10 - 21/10 - 22/10 21.

Main boiler safety valves adjusted 21/10 21. Thickness of adjusting washers No washers, chocks with fitted.

Material and tensile strength of Rotor shaft ✓ Identification Mark on Do. ✓

Material and tensile strength of Pinion shaft ✓ Identification Mark on Do. ✓

Material of Wheel shaft ✓ Identification Mark on Do. ✓ Material of Thrust shaft S.M.T. steel. Identification Mark on Do. 5/8/13 7-20-LK 1-21-LK

Material of Tunnel shafts S.M.T. steel. Identification Marks on Do. 5820-2-34-40-41 7-20-LK 1-21-LK Material of Screw shafts S.M.T. steel Identification Marks on Do. 5837-2936 (Spare) 7-20-LK 1-21-LK

Material of Steam Pipes Seamless steel. Test pressure 600 lbs. per □"

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 a 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 of the main boilers, stern tube, intermediate and propeller shafts from the commencement of construction until the final trial under steam. The dimensions are as specified and in accordance with the approved plans and the requirements contained in letters E dated 23/12 18 and 24/8 20. - The main turbine as well as the whole auxiliary machinery and the boilers have been fitted in accordance with the Rules, letters E dated 3/3 & 26/8 1920 and to our satisfaction. On the trial trip the whole of the machinery worked satisfactorily and the manoeuvring of the main engine was found good.

Recommend the vessel's machinery to have notation of ✠LMC-10-21 in the Reg. Book.

		When applied for,
The amount of Entry Fee	£ 65.20	14-11-1921
Special	£ 624.73	
~~Electric Light & Power~~ ~~Donkey Boiler~~ Fee	£ 484.57	When received,
Travelling Expenses (if any)	£ 22.00	19-11-1921
LATE FEE	£ 30.00	

A. O. Jacobsen. H. Schiffer. H. Clausen. Engineer Surveyors to Lloyd's Register of Shipping.

Committee's Minute FRI. 10 DEC. 1921

Assigned ✠LR 6.10.21 F.D.

MACHINERY DEPT. WRITTEN.

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

Certificate (if required) to be sent to

Rpt. 9a.

Port of Copenhagen Continuation of Report No. 6236 dated 10th Novbr. 1921 on the

STEEL SC. SR. "STAL" of Copenhagen.

v/s Baltica Forfelt's yard No 2.

The auxiliary machinery comprising:

One 24 Kwt. Dynamo, giving current to Light and Power and wireless telegraph when at sea. In the case of damage to the turbine working the auxiliary aggregate, this dynamo can be run as motor - taking current from the 50 Kwt. spare Turbo-Dynamo mentioned below. — All driven by a de Laval turbine

One centrifugal circulating pump

One " " Cinetic pump

A part of the water from the latter is working

One water turbine, directly coupled to

one centrifugal pump, taking the condensed water from the bottom of the condenser to the Cinetic tank.

One steam air-ejector.

One spare do.

One Weir's steam feed pump, 9½" x 7" x 18", single cylinder.

One " donkey " " - " - " - " - " - "

One spare lubricating oil pump, 135 x 135 x 125 m/m. Duplex.

One ballast pump for water, 315 x 210 x 380 m/m - " -

One " " " oil, - " - " - " - " -

Two bilge pumps & one sanitary pump, 5½" dia. x 5" stroke, plunger, 100 R/M. driven by a 6 HP shunt wound Electro motor.

One Evaporator pump, 2⅜" dia. x 125 m/m stroke, plunger, worked from the end of the bilge pump shaft.

One Weir's Evaporator, 10 ts capacity.

One auxiliary condenser.

One Economizer.

One fan for forced draught, driven by a single cylinder steam engine.

One lubricating oil filter

One filter oil pump, 2" x 1¼" x 2¾" duplex.

One 7.5 Kwt. Dynamo worked by a single cylinder steam engine, intended for use at Port.

One 50 Kwt. Dynamo, directly coupled to a de Laval turbine and intended for use in the case of damage to the turbine working the auxil. aggregate.

No. 2 main lubricating oil pumps are spur wheel pumps driven by worms and worm wheels from the 1st gear wheel shaft of the main turbine.

The forgoing is a correct description.

AKTIESELSKABET KJØBENHAVNS FLYDEDOK og SKIBSVÆRFT Manufacturers.

A. O. Jacobsen. H. Schiffer.

SURVEYORS TO LLOYD'S REGISTER OF SHIPPING

3m.11.19. Ove Munck

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