

REPORT ON STEAM TURBINE MACHINERY. No. 7654

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Date of writing Report 16th Apr. 1942 When handed in at Local Office 16th Apr. 1942 Port of Baltimore, Maryland

No. in Survey held at Baltimore, Maryland Date, First Survey 23 Aug. 1941 Last Survey 10th Feb. 1942

Reg. Book. on the Single Screw Steamer "CATAWBA" (Number of Visits 43)

Gross Tons 9930
Net Tons 5907

Built at Sparrows Point, Md. By whom built Bethlehem Steel Co. Yard No. 4356 When built 1942

Engines made at Essington, Pa. By whom made Westinghouse E & M Co. Engine No. 1A9304-4 When made 1941

Boilers made at Carteret, N. J. By whom made Foster-Wheeler Corp. Boiler No. FW 455-6 When made 1941

Shaft Horse Power at Full Power 12000 Owners Socony-Vacuum Oil Co. Port belonging to New York, N. Y.

Nom. Horse Power as per Rule 1884 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

Trade for which Vessel is intended Carrying petroleum in bulk

STEAM TURBINE ENGINES, &c.—Description of Engines Impulse, reaction cross compound.

No. of Turbines Ahead two ✓ Astern one ✓ ~~one~~ to one propelling shafts. No. of primary pinions to each set of reduction gearing 2 ✓

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

TURBINE				I. P.				L. P.				ASTERN.			
BLADING															
	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.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
Impulse Stage	1.12"	23.12"	1												
1ST EXPANSION	2.26	24.26	1				1.27 to	30.54 to	5	1.40"	30.65"	1			
1ST Blade Ring	1.14 to	16.28 to	6				3.47	35.00		2.82"	32.07	1			
continuous taper	1.69	17.43													
2ND Blade Ring	1.81" to	17.65 to	8				4.47 to	37.00 to	5	2.25	32.00	1			
3TH "	3.06	20.18					9.98	48.00		3.61	33.36	1			
6TH "															
7TH "															
8TH "															
9TH "															
10TH "															
11TH "															
12TH "															

Shaft Horse Power at each turbine { H.P. 5300 ✓ I.P. — L.P. 6700 ✓ } Revolutions per minute, at full power, of each Turbine Shaft { H.P. 5300 ✓ I.P. — L.P. 6700 ✓ }

Rotor Shaft diameter at journals { H.P. 5" ✓ I.P. — L.P. 6 1/2" ✓ } Pitch Circle Diameter { 1st pinion 13.969" ✓ 2nd pinion 25.912" ✓ } 1st reduction wheel 106.211" ✓ main wheel 145.13" ✓

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 15-5/8" ✓ 2nd pinion 3'-4" ✓ } 1st reduction wheel 15-5/8" ✓ main wheel 3'-4" ✓

Flexible Pinion Shafts, diameter { 1st 5" ✓ 2nd 5" ✓ } Pinion Shafts, diameter at bearings { 1st 16" ✓ 2nd 16" ✓ } diameter at wheel shroud, { 1st 102-7/8" ✓ 2nd 141.0" ✓ } Generator Shaft, diameter at bearings — Propelling Motor Shaft, diameter at bearings —

Intermediate Shafts, diameter { as per rule 19.41 ✓ as fitted 19-1/2" ✓ } Thrust Shaft, diameter at collars { as per rule 21.05" ✓ as fitted 22"-22-1/16" ✓ } Is the tube screw shaft fitted with a continuous liner { Yes ✓ }

Tube Shaft, diameter { as per rule — as fitted — } Screw Shaft, diameter { as per rule 21.05" ✓ as fitted 22"-22-1/16" ✓ } Is the tube screw shaft fitted with a continuous liner { Yes ✓ }

Bronze Liners, thickness in way of bushes { as per rule .95 ✓ as fitted 1-1/8" ✓ } Thickness between bushes { as per rule .713" ✓ as fitted 1-3/64" ✓ } Is the after end of the liner made watertight in the propeller boss { Yes ✓ }

If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner —

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 —

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 ✓ }

Length of Bearing in Stern Bush next to and supporting propeller 7'-4" ✓

Propeller, diameter 19'-8" ✓ Pitch 18'-10" ✓ No. of Blades 4 ✓ State whether Moveable No ✓ Total Developed Surface not given 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. or I.P. Turbine exhaust direct to the Condenser { Yes ✓ }

No. of Turbines fitted with astern wheels 1 ✓ Feed Pumps { No. and size 1-400 GPM ✓ 1-175 GPM ✓ 1-75 GPM ✓ } How driven { Gen. Ser. Bilge ER ✓ 1-75 GPM ✓ 1-75 GPM ✓ } A.P. Rm. 1-75 GPM ✓

Pumps connected to the Main Bilge Line { No. and size 1-300 GPM ✓ 1-600 GPM ✓ 1-400 GPM in F. P. Rm. ✓ } How driven { Rot. Turb. ✓ Cent. E. Motor ✓ Rot. Elec. ✓ Rot. Turb. ✓ } 2-Vert. Rotary 450 G.P.M. ✓

Ballast Pumps, No. and size { Rot. Turb. ✓ Cent. E. Motor ✓ } Lubricating Oil Pumps, including Spare Pump, No. and size driven by 25 HP Elec. Motor ✓

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 2-3" at Fwd. end; 4-2" at Fwd. end; 1-4" at After end of ER In Pump Room —

In Holds, &c. —

Main Water Circulating Pump Direct Bilge Suctions, No. and size 1-18" ✓ Independent Power Pump Direct Suctions to the Engine Room { Bilges, No. and size 1-4" ✓ } 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 with doublers on shell { Yes ✓ } Are they fitted with Valves or Cocks { Valves ✓ }

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 { Spigot ✓ }

What pipes pass through the bunkers { None ✓ } How are they protected { None ✓ }

What pipes pass through the deep tanks { Fore Peak ballast line 3-1/2" ✓ } Have they been tested as per rule { Yes ✓ }

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 { — } Is it fitted with a watertight door { — } worked from —

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BOILERS, &c.—(Letter for record ☒) Total Heating Surface of Boilers 14960 sq. ft. 7400
Is Forced Draft fitted ☒ Yes No. and Description of Boilers 2 Foster Wheeler Water Tube Working Pressure 490 lbs. per sq. in.
Is a Report on Main Boilers now forwarded? ☒ Yes
Is ☒ a Donkey ☐ an Auxiliary Boiler fitted? No If so, is a report now forwarded? -
Is the donkey boiler intended to be used for domestic purposes only -
Plans. Are approved plans forwarded herewith for Shafting 18-7-40 Main Boilers 10-7-40 Auxiliary Boilers - Donkey Boilers -
(If not state date of approval)
Superheaters 10-7-40 General Pumping Arrangements 18-11-40 Oil Fuel Burning Arrangements 12-6-40
SPARE GEAR.
Has the spare gear required by the Rules been supplied ☒ Yes
State the principal additional spare gear supplied Please see attached list.

The foregoing is a correct description,

J. A. Hodge
BETHLEHEM-SPARROWS POINT
SHIPYARD, INC.
SPARROWS POINT, MD. Manufacturer.

Dates of Survey while building { During progress of work in shops -- 10, 20, May; 3, 11, 16, 29 June; 7, 30, July; 5 Aug.; 2, 16, 19 Sept.; 1, 13, 16 Oct. 1941
During erection on board vessel --- 1941 23 Aug.; 4, 5, 6, 9, 10, 12, 14, 15, 16, 18, 19, 20, 29, 31 Dec.; 2, 3, 6, 9, 16, 17, 22, 26, 27, 31 Jan.; 5, 10 Feb. 1942
Total No. of visits 43

Dates of Examination of principal parts—Casings 16th Oct. 41 Rotors 16th Oct. 41 Blading 16th Oct. 41 Gearing 16th Oct. 41
Wheel shaft 16th Oct. 41 Thrust shaft - Intermediate shafts 15th Dec. 41 Tube shaft - Screw shaft 15th Dec. 41
Propeller 16th Dec. 41 Stern tube 14th Dec. 41 Engine and boiler seatings 10th Dec. 41 Engine holding down bolts 22nd Jan. 42
Completion of fitting sea connections 16 Dec 41 Completion of pumping arrangements 15 Jan. 42 Boilers fired 10 Dec. 41 Engines tried under steam 10 Feb. 42

Main boiler safety valves adjusted 16 Jan. 42 Thickness of adjusting washers 95000 91500 95000 94500
Rotor shaft, Material and tensile strength O.H. Steel HP 91000 97500 LP 94000 96500 Identification Mark HP 7052 JKH
Flexible Pinion Shaft, Material and tensile strength O.H. Steel LP 79000 HP 81250 LP 4404 WHR
Pinion shaft, Material and tensile strength O.H. Steel HP 107500 LP 102000 Identification Mark HP 1372 RWS
1st Reduction Wheel Shaft, Material and tensile strength O.H. Steel HP 103000 LP 105000 Identification Mark LP 1373 RWS
Wheel shaft, Material O.H. STEEL Identification Mark 6736 HBC Thrust shaft, Material - Identification Mark HP 1407 JWB
Intermediate shafts, Material O. H. Steel Identification Marks 9357 JEM Tube shaft, Material - Identification Marks LP 4379 WHR
Screw shaft, Material O.H. Steel Identification Marks 6862 JVCM Steam Pipes, Material Seamless Steel Test pressure 1200 lbs. Identification Mark 6754 HBC
Date of test 2nd January 1942 Spare 3082 JVCM Identification Mark 7023 JKH
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 -

Is this machinery a duplicate of a previous case ☒ Yes If so, state name of vessel Corsicana, Caddo, Calusa
General Remarks (State quality of workmanship, opinions as to class, &c.) The machinery of this vessel has been built under Special Survey in accordance with the Society's Rules. Please refer to reports from New York No. 41714, Boston, Mass. Nos. 3647-8 and Philadelphia No. 8159 also forging and casting reports which are attached hereto. Same has now been installed and fitted in the vessel inclusive of the erection and completion of the Water Tube Boilers and their accessories and all auxiliaries. The workmanship and material throughout is good. The propelling machinery and all auxiliaries have been tested under full working conditions and the machinery is in safe working condition and eligible in my opinion to have the record of * LMC 2,42, also fitted for oil fuel 2,42 F.P. above 150° F. made in the Register Book.
Please note the HP turbine flexible pinion shaft had a 4" hole bored through it, which was approved by the New York office

The amount of Entry Fee ... £ 30.00 : When applied for, Mar. 20, 1942
Special ... £ 207.50 :
Economisers 56.50 :
Donkey Boiler Fee ... £ 20.00 : When received, Apr. 24, 1942
Late Fees :
Travelling Expenses (if any) £ 40.00 :

Committee's Minute

Assigned + LMC-2,42

Wm. C. Cowin
Engineer Surveyor to Lloyd's Register of Shipping.

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Foundation