

REPORT ON STEAM TURBINE MACHINERY. No. 4281

Received at London Office 3 APR 1950

pt. 4a.

Date of writing Report 22 November 1949 When handed in at Local Office 19 Port of Boston, Massachusetts
 Date, First Survey 17 August Last Survey 24 October 1949
 Reg. Book on the S.S. SAN TOME
 (Number of Visits 5)
 Tons { Gross
 Net
 Built at Sparrows Point, Md. By whom built Bethlehem Steel Co. Yard No. 4471 When built 1949
 Engines made at Quincy, Mass. By whom made Bethlehem Steel Co. Engine No. When made 1949
 Boilers made at By whom made Boiler No. When made
 Shaft Horse Power at Full Power 12,500 Owners Gulf Oil Co. Port belonging to
 Nom. Horse Power as per Rule 1325 Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted
 Trade for which Vessel is intended

STEAM TURBINE ENGINES, &c.—Description of Engines Cross Compound Turbines

Ahead Two ~~XXXXXXX~~
 No. of Turbines One ~~XXXXXXX~~ to One propelling shafts. No. of primary pinions to each set of reduction gearing Two
 Astern One double reduction geared
 Direct coupled to { Alternating Current Generator phase periods per second } rated Kilowatts Volts at revolutions per minute;
 Direct Current Generator
 or supplying power for driving Propelling Motors, Type
 at Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

TURBINE BLADING.	H. P.			L.P. REACTION.			L. P. CONT'D.			ASTERN. IMPULSE		
	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	3/4"	29-1/8"	1	1.750"	32.303"	1	3.277"	44.743"	1	3/4"	48-1/8"	1
2ND	1-3/8"	30"	1	1.800"	33.160"	1	3.965"	46.519"	1	1-1/4"	48-5/8"	1
3RD	1-1/8"	18-3/4"	5	1.876"	34.016"	1	4.113"	48.295"	1	1-3/4"	49-1/8"	1
4TH	1-3/8"	19-1/4"	4	1.951"	34.870"	1	4.633"	51.640"	1			
5TH	1-5/8"	19-3/4"	4	2.027"	35.728"	1	5.173"	53.869"	1	4"	47"	1
6TH	1-7/8"	20-1/4"	3	2.102"	36.584"	1	6.074"	56.275"	1	6"	49"	1
7TH	2-1/8"	20-3/4"	3	2.223"	37.710"	1	7.354"	58.835"	1			
8TH	2-1/2"	21-1/2"	3	2.370"	38.814"	1	8.722"	61.571"	1			
9TH				2.516"	39.916"	1	10.250"	64.625"	1			
10TH				2.662"	41.768"	1						
11TH				2.808"	42.120"	1						
12TH				2.954"	43.222"	1						

Shaft Horse Power at each turbine { H.P. 6250
 I.P. 6250
 L.P. 6250 } Revolutions per minute, at full power, of each Turbine Shaft { H.P. 4700
 I.P. 4700
 L.P. 2600 } 1st reduction wheel
 main shaft 100

Rotor Shaft diameter at journals { H.P. 5"
 I.P. 5"
 L.P. 9" } Pitch Circle { 1st pinion 1st reduction wheel
 Diameter 2nd pinion main wheel } Width of { 1st reduction wheel
 Face main wheel }

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 1st reduction wheel
 2nd pinion main wheel }

Flexible Pinion { 1st
 Shafts, diameter 2nd } Pinion Shafts, diameter at bearings External 1st { 2nd } diameter at bottom of pinion teeth { 1st
 Internal 2nd }

Wheel Shafts, diameter at bearings { 1st
 main } diameter at wheel shroud, { 1st
 main } Generator Shaft, diameter at bearings
 Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter as per rule
 as fitted Thrust Shaft, diameter at collars as per rule
 as fitted Tube Shaft, diameter as per rule
 as fitted

Screw Shaft, diameter as per rule
 as fitted Is the { tube
 screw } shaft fitted with a continuous liner { Bronze Liners, thickness in way of bushes as per rule
 as fitted }

Thickness between bushes as per rule
 as fitted Is the after end of the liner made watertight in the propeller boss 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 Length of Bearing in Stern Bush next to and supporting propeller

Propeller, diameter Pitch No. of Blades State whether Moveable Total Developed Surface square feet.

of Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine Can the H.P. or I.P. Turbine exhaust direct to the

Condenser No. of Turbines fitted with astern wheels Feed Pumps { No. and size
 How driven }

Pumps connected to the Main Bilge Line { No. and size
 How driven }

Ballast Pumps, No. and size Lubricating Oil Pumps, including Spare Pump, No. and size

Are two independent means arranged for circulating water through the Oil Cooler Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge

Pumps, No. and size:—In Engine and Boiler Room

In Holds, &c.

Main Water Circulating Pump Direct Bilge Suctions, No. and size Independent Power Pump Direct Suctions to the Engine Room

Bilges, No. and size Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes

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

Are all Sea Connections fitted direct on the skin of the ship Are they fitted with Valves or Cocks

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates Are the Overboard Discharges above or below the deep water line

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Are the Blow Off Cocks fitted with a spigot and brass covering plate

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

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 Is the Shaft Tunnel watertight Is it fitted with a watertight door worked from

8120-345110-935110

BOILERS, &c.— (Letter for record) Total Heating Surface of Boilers

Is Forced Draft fitted

No. and Description of Boilers

Working Pressure

Is a Report on Main Boilers now forwarded?

Is { a Donkey } Boiler fitted?
{ an Auxiliary }

If so, is a report now forwarded?

Plans. Are approved plans forwarded herewith for Shafting
(If not state date of approval)

Main Boilers

Auxiliary Boilers

Donkey Boilers

Superheaters General Pumping Arrangements

Oil Fuel Burning Arrangements

Spare Gear. State the articles supplied:—

One complete set of bearing shells and thrust shoes.

Six H. P. casing joint bolts.

Eleven L. P. casing joint bolts.

Six bearing cap studs.

The foregoing is a correct description,

Bethlehem Steel Co.
by A. H. Gardner

Manufacturer

Dates of Survey while building { During progress of work in shops - - } August 17, 1949, October 18, 20, 21, 24, 1949
{ During erection on board vessel - - }
Total No. of visits 5

Dates of Examination of principal parts—Casings Aug. 17, Oct. 18, 24, 1949 Rotors Aug. 17, Oct. 18, 24, 1949 Blading Aug. 17, Oct. 18, 24, 1949 Gearing Oct. 18, 24, 1949

Wheel shaft Thrust shaft Intermediate shafts Tube shaft Screw shaft

Propeller Stern tube Engine and boiler seatings Engine holding down bolts

Completion of pumping arrangements Boilers fixed Engines tried under steam

Main boiler safety valves adjusted Thickness of adjusting washers

L.P. Rotor ~~XXX~~ Material and tensile strength 0. H. Steel 81,000 lbs.

Identification Mark

Flexible Pinion Shaft, Material and tensile strength

Identification Mark

Pinion shaft, Material and tensile strength

Identification Mark

1st Reduction Wheel Shaft, Material and tensile strength

Identification Mark

Wheel shaft, Material Identification Mark

Thrust shaft, Material Identification Mark

Intermediate shafts, Material Identification Marks

Tube shaft, Material Identification Marks

Screw shaft, Material Identification Marks

Steam Pipes, Material Test pressure

Date of test Is an installation fitted for burning oil fuel

Is the flash point of the oil to be used over 150°F. Have the requirements of the Rules for the use of oil as fuel been complied with

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

Is this machinery a duplicate of a previous case If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c. The H. P. and L. P. turbines have been completed under Special Survey in accordance with approved plans. The forgings and castings were tested by A. B. S. and for particulars, please refer to attached Certificate. The workmanship and materials are good. The turbines have been tried out in the shop under no load conditions and found satisfactory. The turbines have been forwarded to the Bethlehem Steel Company, Sparrows Point Yard, Sparrows Point, Md.

Fee to be set at Baltimore

The amount of Entry Fee	£	:	:	When applied for,
Special	£	:	:	19
Donkey Boiler Fee	£	:	:	When received,
Travelling Expenses (if any)	£	\$8.00	:	19

Thomas Bowie
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

Assigned *See First Entry Report attached.*



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Foundation