

Rpt. 4a.

# Report on Steam Turbine Machinery.

No. 4810-1958

Date of writing Report **12, Feb. 19 58** When handed in at Local Office **19** Port of **Boston, Massachusetts** Received at London Office  
 No. in Survey held at **Quincy, Massachusetts** Date, First Survey **7, March** Last Survey **25, July 1957**  
 Reg. Book (Number of Visits **9**)

on the \_\_\_\_\_ Tons (Gross \_\_\_\_\_ Net \_\_\_\_\_)  
 Built at **Sparrows Point, Maryland** By whom built **Bethlehem Steel Co.** Yard No. **4553** When built **1957**  
 Engines made at **Quincy, Mass.** By whom made **Bethlehem Steel Co.** Engine No. \_\_\_\_\_ When made **1957**  
 Boilers made at \_\_\_\_\_ By whom made \_\_\_\_\_ Boiler No. \_\_\_\_\_ When made \_\_\_\_\_  
 Shaft Horse Power at Full Power **13,600** Owners \_\_\_\_\_ Port belonging to \_\_\_\_\_  
 Nom. Horse Power as per Rule \_\_\_\_\_ 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 Geared Turbines**

No. of Turbines Ahead **Two** Direct coupled, \_\_\_\_\_  
 Astern **One** single reduction geared } to **one** propelling shafts. No. of primary pinions to each set of reduction gearing \_\_\_\_\_  
 double reduction geared }  
 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.

	H. P.	I. P.	L. P.	ASTERN.
Impulse Blading	Two	None	None	1st stage - Three
Reaction Blading	Six	-	Nine	2nd stage - Two
No. of rows				
No. of stages				
No. of rows in each stage	1 2 3 4 5 6		1 2 3 4 5 6 7 8 9	
	5 4 4 3 3 3		6 6 3 1 1 1 1 1 1	

Shaft Horse Power at each turbine { H.P. **6150** \_\_\_\_\_  
 I.P. \_\_\_\_\_  
 L.P. **7450** \_\_\_\_\_ } Revolutions per minute, at full power, of each Turbine Shaft { H.P. **4717** \_\_\_\_\_ 1st reduction wheel  
 I.P. \_\_\_\_\_  
 L.P. **2581** \_\_\_\_\_ main shaft

Rotor Shaft diameter at journals { H.P. **5.000"** \_\_\_\_\_ Pitch Circle Diameter { 1st pinion \_\_\_\_\_ 1st reduction wheel  
 I.P. \_\_\_\_\_ 2nd pinion \_\_\_\_\_ main wheel  
 L.P. **9.000"** \_\_\_\_\_ Width of Face { 1st reduction wheel \_\_\_\_\_  
 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 Shafts, diameter { 1st \_\_\_\_\_ External  
 2nd \_\_\_\_\_ Internal } Pinion Shafts, diameter at bearings { 1st \_\_\_\_\_ 2nd \_\_\_\_\_ diameter at bottom of pinion teeth  
 1st \_\_\_\_\_ 2nd \_\_\_\_\_

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

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

Tube Shaft, diameter as per rule \_\_\_\_\_ Screw Shaft, diameter as per rule \_\_\_\_\_  
 as fitted \_\_\_\_\_ as fitted \_\_\_\_\_ Is the { tube } shaft fitted with a continuous liner { \_\_\_\_\_  
 screw }

Bronze Liners, thickness in way of bushes as per rule \_\_\_\_\_ Thickness between bushes as per rule \_\_\_\_\_ Is the after end of the liner made watertight in the  
 as fitted \_\_\_\_\_ as fitted \_\_\_\_\_ 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 \_\_\_\_\_ If so, state type \_\_\_\_\_ 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.  
 If Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine \_\_\_\_\_ Can the H.P. or I.P. Turbines 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 both to Main Bilge Pumps and Auxiliary  
 Bilge Pumps, No. and size:—In Engine and Boiler Room \_\_\_\_\_ In Pump 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 \_\_\_\_\_

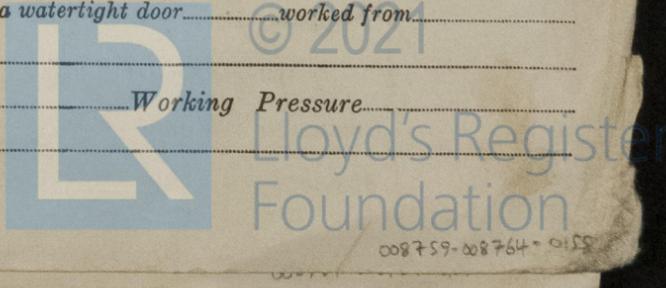
Are the Bilge Suctions in the Machinery Space led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges \_\_\_\_\_  
 Are all Sea Connections fitted direct on the skin of the ship \_\_\_\_\_ Are they fitted with Valves or Cocks \_\_\_\_\_

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 \_\_\_\_\_

BOILERS, &c.—(Letter for record \_\_\_\_\_) Total Heating Surface of Boilers \_\_\_\_\_ Working Pressure \_\_\_\_\_  
 Is Forced Draft fitted \_\_\_\_\_ No. and Description of Boilers \_\_\_\_\_  
 Is a Report on Main Boilers now forwarded? \_\_\_\_\_



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Is <sup>a Donkey</sup> Boiler fitted? <sub>an Auxiliary</sub> ..... 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..... Main Boilers..... Auxiliary Boilers..... Donkey Boilers.....  
(If not, state date of approval)

Superheaters..... General Pumping Arrangements..... Oil Fuel Burning Arrangements.....

Geared turbines situated aft. Have torsional vibration characteristics of system been approved..... Date of approval.....

**SPARE GEAR.**

Has the spare gear required by the Rules been supplied? .....

State the principal additional spare gear supplied.....

**As specified,**

The foregoing is a correct description.

*Bethlehem Steel Co. Ship. Div. Quincy*  
*A Gardner Ch. Mech. Draft*

Dates of Survey while building: During progress of work in shops - - Mar. 7-22; Apr. 2; May 15; June 17-20; July 8-15-25;  
During erection on board vessel - - 9 Mar. 7-22; Apr. 2; May 15; June 20  
Total No. of visits.....

Dates of Examination of principal parts—Casings June 17-20; Rotors July 8-15-25; Blading July 8; Gearing June 20

Wheel shaft..... Thrust shaft..... Intermediate shafts..... Tube shaft..... Screw shaft.....

Propeller..... Stern tube..... Engine and boiler seatings..... Engine holding down bolts.....

Completion of fitting sea connections..... Completion of pumping arrangements..... Boilers fixed..... Engines tried under steam.....

Main boiler safety valves adjusted..... Thickness of adjusting washers.....

Rotor ~~shaft~~ Material and tensile strength O.H. Steel L.P. 78,000 PSI Lloyd's #8492, 2  
H.P. 102,500 PSI Identification Mark.....

Flexible Pinion Shaft, Material and tensile strength..... Identification Mark.....

Pinion shaft, Material and tensile strength..... Identification Mark.....

.....; Chemical analysis.....

If Pinion Shafts are made of special steel state date of approval of chemical analyses, physical properties and heat treatment.....

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.....

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..... If so, state name of vessel.....

**General Remarks.** (State quality of workmanship, opinions as to class, &c.) **The H.P. and L.P. main turbines have been under the Special Survey of the Society's Surveyors in accordance with approved plans and in conformity with the Society's Rules, except that the H.P. rotor forging was tested by American Bureau of Shipping Surveyors.**

The workmanship and material are good throughout.  
These units have been tested under steam, also run at overspeed with no appreciable vibration.

These units will be forwarded to the Bethlehem Steel Company's Sparrows Point Shipyard, Sparrows Point, Maryland for installation in their Hull No. 4553, and have been marked for identification as follows:

<b>L.P. Turbine</b>	<b>H.P. Turbine</b>
Lloyd's No. 535	Lloyd's No. 534
25-7-57	25-7-57
T.B.	T.B.

The amount of Entry Fee ... \$450 : 00 : When applied for.  
Special ... : : 12, Feb. 19 58  
Donkey Boiler Fee ... : : When received.  
Travelling Expenses (if any) 10 : 00 :  
NEW YORK APR 30 1958

*Thomas Barrie*  
Engineer Surveyor to Lloyd's Register of Shipping  
**THOMAS BARRIE**

Committee's Minute  
Assigned..... See Bae. 11353.



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Foundation

Certificate (if required) to be sent to  
(The Surveyors are requested not to write on or below the space for Committee's Minute.)

*AR*  
19.5.58

15