

## Report on Steam Turbine Machinery.

No. 4810

Date of writing Report **12, Feb. 1958** When handed in at Local Office **19** Port of **Boston, Massachusetts**  
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 **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 **Two** Direct coupled, **One** single reduction geared } to **one** propelling shafts. No. of primary pinions to each set of reduction gearing  
Astern **One** double reduction geared }  
direct coupled to Alternating Current Generator phase periods per second } rated Kilowatts Volts at revolutions per minute;  
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	<b>Two</b>	<b>None</b>	<b>None</b>	<b>1st stage - Three</b>
No. of rows	<b>Six</b>	<b>-</b>	<b>Nine</b>	<b>2nd stage - Two</b>
No. of stages				
Reaction Blading	<b>1 2 3 4 5 6</b>	<b>-</b>	<b>1 2 3 4 5 6 7 8 9</b>	
No. of rows in each stage	<b>5 4 4 3 3 3</b>	<b>-</b>	<b>6 6 3 1 1 1 1 1 1</b>	

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

Rotor Shaft diameter at journals **H.P. 5.000"** **I.P. 9.000"** **L.P. 9.000"** Pitch Circle Diameter **1st pinion** **2nd pinion** **1st reduction wheel** **main wheel** 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** **2nd pinion** **1st reduction wheel** **main wheel**

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

Is Forced Draft fitted No. and Description of Boilers Working Pressure

Is a Report on Main Boilers now forwarded?



Is ☐ a Donkey ☐ an Auxiliary Boiler fitted? 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 - - -  
Total No. of visits 9 Mar. 7-22; Apr. 2; May 15; Mar. 7-22; May 15 June 20

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

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

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 : 19

Committee's Minute

Assigned

See Bae. 11353.

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



Lloyd's Register  
Foundation

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

19-5-58

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