

# Report on Steam Turbine Machinery. No. 4768

Rpt. 4a.

Date of writing Report 5, June 19 57 When handed in at Local Office 19 Port of Boston, Massachusetts Received at London Office 19 MAY 1956  
 No. in Survey held at Fitchburg, Massachusetts Date, First Survey 14, Nov. 1956 Last Survey 22, Jan. 1957  
 Reg. Book \_\_\_\_\_ (Number of Visits 3)

Built at Sparrows Point, Maryland By whom built Bethlehem Steel Company Yard No. 4553 Tons (Gross) \_\_\_\_\_ (Net) \_\_\_\_\_  
 Engines made at Fitchburg, Mass. By whom made General Electric Co. Turbine No. 126039 When built 1957  
 Boilers made at \_\_\_\_\_ By whom made \_\_\_\_\_ Engine No. 126040 When made 1956  
 Shaft Horse Power at Full Power \_\_\_\_\_ Owners \_\_\_\_\_ Gear No. 118119 When made \_\_\_\_\_  
 Nom. Horse Power as per Rule \_\_\_\_\_ Is Refrigerating Machinery fitted for cargo purposes \_\_\_\_\_ Boiler No. 118117 When made \_\_\_\_\_  
 Trade for which Vessel is intended \_\_\_\_\_ Port belonging to \_\_\_\_\_ Is Electric Light fitted \_\_\_\_\_

## STEAM TURBINE ENGINES, &c.—Description of Engines 500 KW Generating Units for Ships Auxiliary Power

No. of Turbines 2 ~~Direct coupled,~~ single reduction geared to propelling shafts No. of primary pinions to each set of reduction gearing 1  
~~direct coupled to~~ Alternating Current Generator 3 phase 60 periods per second Direct Current Generator rated 500 Kilowatts 450 Volts at 1200 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 { No. of rows _____	<u>Five (1 per stage)</u>			
Reaction Blading { No. of stages _____	"			
{ No. of rows in each stage _____				

Shaft Horse Power at each turbine { H.P. 800 (625 KW - 5/4 Load) } H.P. 10,059 1st reduction wheel \_\_\_\_\_  
 { I.P. \_\_\_\_\_ } I.P. \_\_\_\_\_ Gen. \_\_\_\_\_  
 { L.P. \_\_\_\_\_ } L.P. \_\_\_\_\_ main shaft 1200

Rotor Shaft diameter at journals { H.P. 2-1/2" Pitch Circle Diameter { 1st pinion 3.4" 1st reduction wheel \_\_\_\_\_ } Width of Face { 1st reduction wheel \_\_\_\_\_ }  
 { I.P. \_\_\_\_\_ } { 2nd pinion \_\_\_\_\_ main wheel 28.5" } { main wheel 8-1/4" }  
 { L.P. \_\_\_\_\_ }

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 6-5/8 & 5-5/8 1st reduction wheel \_\_\_\_\_ }  
 { 2nd pinion \_\_\_\_\_ main wheel 6-1/2 }

Flexible Pinion Shafts, diameter { 1st \_\_\_\_\_ } Pinion Shafts, diameter at bearings { External 1st { 3" } 2nd { \_\_\_\_\_ } diameter at bottom of pinion teeth { 1st 3.1718" }  
 { 2nd \_\_\_\_\_ } Internal { \_\_\_\_\_ } { 2nd { \_\_\_\_\_ } }

Wheel Shafts, diameter at bearings { 1st \_\_\_\_\_ } Hub diameter at wheel 4.1270 Generator Shaft, diameter at bearings 4" dia.  
 { main 4" } 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 \_\_\_\_\_ Is the { tube } shaft fitted with a continuous liner { \_\_\_\_\_ }  
 as fitted \_\_\_\_\_ as fitted \_\_\_\_\_ { 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 propeller boss \_\_\_\_\_  
 as fitted \_\_\_\_\_ as fitted \_\_\_\_\_ 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. \_\_\_\_\_ Independent Power Pump Direct Suctions to the Engine Room \_\_\_\_\_

Main Water Circulating Pump Direct Bilge Suctions, 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 \_\_\_\_\_

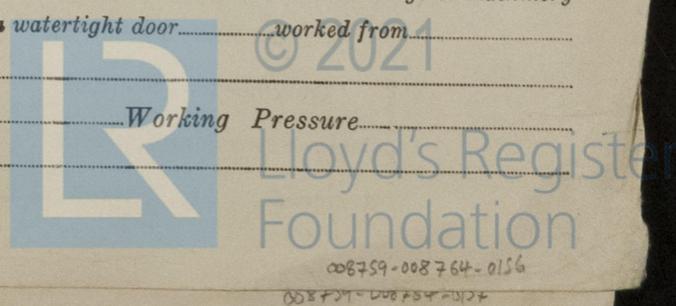
What pipes pass through the bunkers \_\_\_\_\_ How are they protected \_\_\_\_\_

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 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.

*A. S. Sutton, Product Applications*

Dates of Survey while building During progress of work in shops - - Nov. 14, 1956, Jan. 18 and 22, 1957  
During erection on board vessel - -  
Total No. of visits 3

Dates of Examination of principal parts—Casings Nov. 14, 1956 Rotors Jan. 18 & 22, 1957 Blading Jan. 18 & 22, 1957 Gearing Jan. 22, 1957

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 Rad. Long. 115,000 PSI 125,000 PSI Identification Mark No. 515  
105,500 PSI 124,500 PSI No. 516

Flexible Pinion Shaft, Material and tensile strength O.H. Steel 164,900 PSI Identification Mark No. 515  
162,800 PSI No. 516

Pinion ~~shaft~~ Material and tensile strength O.H. Steel 172,200 PSI Brin. 331-302 Identification Mark No. 515  
149,400 PSI Brin. 302-341 No. 516

Chemical analysis C. Mn. Ph. S. Si. Ni. Cr. Mo.  
.41 .78 .017 .024 .31 1.79 .82 .24  
.41 .75 .014 .024 .25 1.81 .79 .25

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

1st Reduction Wheel Shaft, Material and tensile strength Identification Mark No. 515 22-1-57

Wheel shaft, Material O.H. Steel Identification Mark No. 516 22-1-57 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.) These turbo generators have been built to the Special Survey of the Society's Surveyors in accordance with approved plans and otherwise in conformity with the Society's Rules.

The workmanship and material are good throughout.

These units have been tested under steam, also run at overspeed with no appreciable vibration in either turbo units, gears or generators. The overspeed and back pressure trips were tested with satisfactory results.

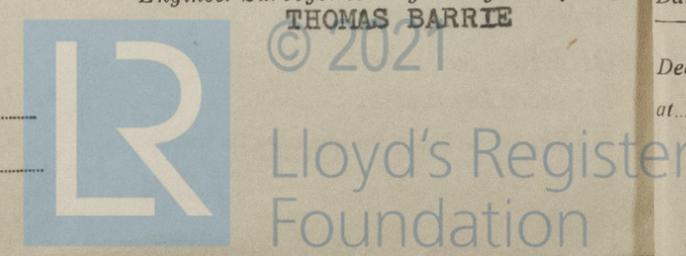
These units will be forwarded to the Bethlehem Steel Company's Sparrows Point Shipyard, Sparrows Point, Maryland for installation in their Hull No. 4553, and have been marked for identification as follows:

Turbine Serial No. 126039	Turbine Serial No. 126040	Generator Nos.
LLOYD'S NO. 515	LLOYD'S NO. 516	8272895
22-1-57	22-1-57	8272893
T.B.	T.B.	

The amount of Entry Fee ... 400 : 00 : When applied for.  
Special ... : : 5, June 1957  
Donkey Boiler Fee ... : : When received.  
Travelling Expenses (if any) 15 : 00 : 19

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

Committee's Minute NEW YORK APR 30 1958  
Assigned See Ser. 11353.



19-5-57

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