

REPORT ON STEAM TURBINE MACHINERY. No. 6889

Received at London Office 13 APR 1935

Date of writing Report 21st March 1935 When handed in at Local Office 30th March 1935 Port of Philadelphia

No. in Survey held at Trenton N.J. Date, First Survey 17th May 1934 Last Survey 28th May 1935

Reg. Book. S.S. Socony Vacuum (Number of Visits 20) Tons ^{Gross} 9511.70 _{Net} 5894

Built at Camden N.J. By whom built New York Shipbuilding Corp. Yard No. 414 When built 1935-

Engines made at Trenton N.J. By whom made De Laval Steam Turbine Co. Engine No. 223944 When made 1934-11

Boilers made at Carteret N.J. By whom made Foster Wheeler Boiler No. When made 1934

Shaft Horse Power at Full Power 4000 Owners Socony Vacuum Oil Co. Inc. Port belonging to New York

Nom. Horse Power as per Rule 1083 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted yes

Trade for which Vessel is intended Oil in Bulk

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

No. of Turbines 2 ^{Ahead} 1 (in L.P.) ^{Astern} 1 (in L.P.) ^{Direct coupled, single reduction geared} to one propelling shafts. No. of primary pinions to each set of reduction gearing Two

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} one propelling shafts.

TURBINE STAGING.	H. P.			I. P.			L. P.			ASTERN. IN. LOW PRESS. TURBINE					
	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	1.470"	20.736"	2	X	X	X	1.030"	32.600"	1	1.470"	32.201"	2			
2ND "	1.490"	16.816"	1				1.570"	33.410"	1	1.430"	33.046"	2	1.430"	33.046"	2
3RD "	1.710"	16.816"	1				1.935"	33.980"	1	1.430"	33.046"	2	1.430"	33.046"	2
4TH "	1.790"	16.816"	1				2.970"	35.800"	1	1.430"	33.046"	2	1.430"	33.046"	2
5TH "	1.875"	16.816"	1				3.695"	37.380"	1	1.430"	33.046"	2	1.430"	33.046"	2
6TH "	1.975"	16.816"	1				5.010"	39.640"	1	1.430"	33.046"	2	1.430"	33.046"	2
7TH "	1.085"	16.816"	1				7.470"	43.260"	1	1.430"	33.046"	2	1.430"	33.046"	2
8TH "	1.875"	20.736"	1							1.430"	33.046"	2	1.430"	33.046"	2
9TH "	1.000"	20.736"	1							1.430"	33.046"	2	1.430"	33.046"	2
10TH "	1.930"	20.736"	1							1.430"	33.046"	2	1.430"	33.046"	2
11TH "	1.105"	20.736"	1							1.430"	33.046"	2	1.430"	33.046"	2
12TH "	1.320"	20.736"	1							1.430"	33.046"	2	1.430"	33.046"	2

Shaft Horse Power at each turbine ^{H.P.} 2000 ^{L.P.} 2000 ^{H.P.} 5480 ^{L.P.} 4262 1st reduction wheel 703 main shaft 75

Revolutions per minute, at full power, of each Turbine Shaft ^{H.P.} 8166 ^{L.P.} 4262 1st reduction wheel 703 main shaft 75

Rotor Shaft diameter at journals ^{H.P.} 4" ^{L.P.} 4" Pitch Circle Diameter { 1st pinion 10.500" 1st reduction wheel 63.666" 2nd pinion 13.644" main wheel 127.980" Width of Face { 1st reduction wheel 18 3/4" main wheel 48"

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 15 1/2" 1st reduction wheel 15 1/2" 2nd pinion 18 3/8" - 20 3/8" main wheel 44 3/8"

Flexible Pinion Shafts, diameter { 1st 6" 2nd 12" Pinion Shafts, diameter at bearings External 1st 6" 2nd 12" Internal 1st 6" 2nd 12" diameter at bottom of pinion teeth { 1st 7.986" 2nd 13.114"

Wheel Shafts, diameter at bearings { 1st 12" 2nd 22" diameter at wheel shroud, { 1st 2nd Generator Shaft, diameter at bearings Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter as per rule 15.056" as fitted 15 1/4" Thrust Shaft, diameter at collars as per rule as fitted 12 1/2" - 14" 2nd GEAR ROOM Tube Shaft, diameter as per rule as fitted

Screw Shaft, diameter as per rule 16.695" as fitted 14 1/4" Is the { tube screw } shaft filled with a continuous liner { yes } Bronze Liners, thickness in way of bushes as per rule 0.83" as fitted 5/64"

Thickness between bushes as per rule 0.683" as fitted 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 yes If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with plastic material insoluble in water and non-corrosive yes If two liners are fitted, is the shaft lapped or protected between the liners yes 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 6' 2 1/4"

Propeller, diameter 19' 8" Pitch 18 1/4" to 13' 9 1/2" No. of Blades 4 State whether Moveable yes Total Developed Surface 121.64' 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. Turbine exhaust direct to the Condenser yes No. of Turbines fitted with astern wheels 1 in L.P. Feed Pumps { No. and size 2-3800 G.P.M. 1 vert. simplex 15"x10"x24" injector } How driven 6 stage HOR. Turbine Steam } Steam

Pumps connected to the Main Bilge Line { No. and size 1-7"x6"x10" 1-7"x6"x10" 1-7"x6"x10" 1-6"x5 1/2"x6" 1 Rotary 175 G.P.M. } How driven HOR Duplex (STM) FORD, PUMP, RM (STM) AFT, PUMP, RM (STM) HOR Duplex (STM) Electric motor

Ballast Pumps, No. and size 1-general service 12"x10"x12" HOR Dup. (STM) Lubricating Oil Pumps, including Spare Pump, No. and size 2-200 G.P.M. (10HP 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 3- 2 1/2" + 3- 3 1/2"

In Holds, &c. 2- 2 1/2" in big cargo hold 2- 2 1/2" in store room fwd 4- 2 1/2" in mess room pump room 2- 2 1/2" in fwd pump room

Main Water Circulating Pump Direct Bilge Suctions, No. and size 1- 11" diam Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 3- 2 1/2" + 3- 3 1/2" 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 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 yes

What pipes pass through the bunkers Cofferdam Suctions How are they protected

What pipes pass through the deep tanks Suction pipes 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 yes Is it fitted with a watertight door worked from

BOILERS, &c. - (Letter for record W.T.) Total Heating Surface of Boilers 11164 square ft

Is Forced Draft fitted yes No. and Description of Boilers 3 W.T. (2 superheated for propulsion main 430 1 not " " cargo Working Pressure Cargo 405

Is a Report on Main Boilers now forwarded? yes

Is ~~a Donkey~~ an Auxiliary Boiler fitted? yes (could be used for propulsion) If so, is a report now forwarded? yes

Plans. Are approved plans forwarded herewith for Shafting yes Main Boilers yes Auxiliary Boilers yes Donkey Boilers yes

Superheaters yes General Pumping Arrangements yes Oil Fuel Burning Arrangements yes

Spare Gear. State the articles supplied. - 390 Condense tubes 394 ferrules, 20% tubes for oil cooler, 2 bolts & nuts for each pipe rotor bearings, gear wheel bearing & pinion bearings, 1 set of coupling bolts of each size used, 68 coupling bolts & nuts, 10% of bolts & nuts for gear casing & turbine casings, 2 thermometers for oil circulating system, 1 set bearings for each size gear shaft & rotor, 5 pinion shafts, 3 set thrust shoes, 1 set labyrinth packing, 1 set liners for adjusting block, 1 escape valve spring of each size fitted, 1 set of valves for all pumps, 1 tail shaft, 4 propeller blades, air pump rod, circulating pump shaft & impeller, assorted bolts & nuts, brass plates rods of mild steel & brass.

The foregoing is a correct description,

New York Shipbuilding Corp. per P.A. Hausen Chief Engineer, Manufacturer

Table with columns for Dates of Survey while building (1934 May, June, July, August, Sept, October, November, December, January, February) and Total No. of visits (44).

Dates of Examination of principal parts - Casings 6.26, Rotors 10, 10, Blading 17, 20, 26, Gearing 17, 10

Wheel shaft 17, 10, 26, Thrust shaft Dec 18-34, Intermediate shafts 1934 Dec 18, Tube shaft, Screw shaft July 5, 46

Propeller 2, 23, 21, Stern tube 23.26, 21, Engine and boiler seatings 25, 26, Engine holding down bolts 25, 26

Completion of pumping arrangements March 18-35, Boilers fixed November 26-34, Engines tried under steam March 18-35

Main boiler safety valves adjusted 27-2-35, Thickness of adjusting washers

Rotor shaft, Material and tensile strength 2 off. 1 O.H. Steel 16000, 1 - Alloy Steel 123500, Identification Mark 1318, 1316

Flexible Pinion Shaft, Material and tensile strength, Identification Mark

Pinion shaft, Material and tensile strength LP Nickel Steel, Pvc 81000, Sbk 80000, HP 82000, 84500, Identification Mark LWD 1361, 1360, 1364, 1365

1st Reduction Wheel Shaft, Material and tensile strength O.H. Steel 85000, Identification Mark 1370

Wheel shaft, Material O.H. Steel, Identification Mark 1372, Thrust shaft, Material O.H. Steel, Identification Mark 1372

Intermediate shafts, Material Steel 64000 min, Identification Marks 2093, 2100, Tube shaft, Material, Identification Marks

Screw shaft, Material Steel 64000 min, Identification Marks 2096, 2098, Steam Pipes, Material Steel, Test pressure 1350 lbs

Date of test 1934 December 3, 18, 31, Jan 30, 23, 25, 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 oil tanker, If so, have the requirements of the Rules been complied with yes

Is this machinery a duplicate of a previous case no, If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c. This machinery has all been constructed under special survey & satisfactorily installed on board the vessel. All main & auxiliary machinery has been tried out under working conditions & found satisfactory. In my opinion this installation is eligible for the record of +LMC 3.35.

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

Fee \$255, Exps. \$50 plus \$5 nyk, already paid in Dec dr. 1934

Table with columns for The amount of Entry Fee, Special (Pvc.), Donkey Boiler Fee, Travelling Expenses (if any) and When applied for/When received.

M. Dickson, M.D. Kumbham, Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

Assigned +LMC 3.35

