

# REPORT ON STEAM TURBINE MACHINERY. No. 9384

Rpt. 4a.

Received at London Office **30 JAN 1950**

Date of writing Report 23rd Nov. 1949 When handed in at Local Office 23rd Nov. 1949 Port of PHILADELPHIA, PA.  
 No. in Survey held at Chester, Pa. Date, First Survey 1st Sept. Last Survey 23rd November, 1949  
 Reg. Book on the S.S. "SOVAC ASTRAL" (Number of Visits 16) Tons { Gross 17597.94  
 Net -  
 Built at Chester, Pa. By whom built Sun S. B. & D. D. Co. Yard No. 572 When built 1949  
 Engines made at Trenton, N. J. By whom made DeLaval Steam Turbine Co. Engine No. 650145 When made "  
 Boilers made at Barberton, Ohio By whom made Babcock & Wilcox Boiler No. MB-4340 When made "  
 Shaft Horse Power at Full Power 13750 ~~MM~~ 12,500 ~~NOR~~ <sup>MM</sup> Owners Tankers Navigation Corp. Port belonging to Panama  
 Nom. Horse Power as per Rule 3096 ~~MM~~ <sup>MM</sup> Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes  
 Trade for which Vessel is intended Foreign

## STEAM TURBINE ENGINES, &c.—Description of Engines

No. of Turbines 2 ~~Direct coupled~~ <sup>XXXXXX</sup> ~~XXXXXX~~ } to 1 propelling shafts. No. of primary pinions to each set of reduction gearing 2  
 Astern 1 ~~XXXXXX~~ <sup>XXXXXX</sup> ~~XXXXXX~~ }  
 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.			<del>XXXX</del>			L. P.			ASTERN in L.P. 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	1.230"	21.750"	2				1.140"	40.346"	1	1.200"	43.350"	2
2ND "	.620"	21.306"	1				1.540"	41.146"	1	6.000"	44.066"	2
3RD "	.710"	21.486"	1				2.120"	42.390"	1		51.126"	1
4TH "	.760"	21.586"	1				2.880"	43.910"	1			
5TH "	.880"	21.826"	1				4.200"	46.576"	1			
6TH "	.990"	22.046"	1				6.450"	50.826"	1			
7TH "	1.140"	22.346"	1				9.950"	57.576"	1			
8TH "	1.210"	22.486"	1				12.700"	63.100"	1			
9TH "	1.410"	22.886"	1									
10TH "	1.720"	23.506"	1									
11TH "												
12TH "												

Shaft Horse Power at each turbine { H.P. 6250 ✓ ~~XXXX~~ <sup>H.P. 5644</sup> ✓ 1st reduction wheel 793  
 { L.P. 6250 ✓ <sup>L.P. 3546</sup> ✓ main shaft NORMAL 112 ✓  
 { <sup>9.760"-H.P.</sup> <sup>69.461"-H.P.</sup> <sup>MARK 115.7</sup>

Rotor Shaft diameter at journals { H.P. 5" Pitch Circle Diameter { 1st pinion 14.478" 1st reduction wheel 64.743" Width of Face { 1st reduction wheel 18-3/4"  
 { L.P. 8" { 2nd pinion 21.75" main wheel 154.0" { main wheel 35"

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion 14-1/8" 1st reduction wheel 14-5/8"  
 { 2nd pinion 25-1/4" main wheel 28-3/4"

Flexible Pinion Shafts, diameter { 1st 6"-H.P. External { 1st 7"-L.P. 2nd 16" diameter at bottom of pinion teeth { 1st 14.048"-L.P.  
 { 2nd 7"-L.P. Internal { 2nd 10-31/32" { 2nd 21.109"

Wheel Shafts, diameter at bearings { 1st 10" ✓ diameter at wheel shroud, { 1st 12" Generator Shaft, diameter at bearings  
 { main 22" ✓ { main 27" Propelling Motor Shaft, diameter at bearings

Intermediate Shafts, diameter as per rule 19.66" Thrust Shaft, diameter at collars as fitted 13-3/4" Tube Shaft, diameter as per rule None  
 as fitted 19-3/4" as fitted 13-3/4" as fitted

Screw Shaft, diameter as per rule 21.32" Is the screw shaft fitted with a continuous liner { Yes ✓ Bronze Liners, thickness in way of bushes as per rule .977"  
 as fitted 22" { Yes ✓ as fitted 1-1/8"

Thickness between bushes as per rule 733 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  
 as fitted 27/32" Made in one length

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  
 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 8'3" ✓

Propeller, diameter 20' Pitch variable at 7r No. of Blades 4 State whether Moveable No Total Developed Surface 173 sq. ft. 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  
 No. and size 3-350 G.P.M. & 1-30 G.P.M. (Emergency)

Condenser Yes No. of Turbines fitted with astern wheels 1 Feed Pumps { How driven. Turbine Motor  
 { 2-Bilge (E.R.) - 200 G.P.M. - 1 Gen.Serv. 400 G.P.M.  
 { Motor  
 { 1-Ford E.R. - 400 G.P.M.  
 { E.R. (Gen.Serv.) 400 G.P.M. Lubricating Oil Pumps, including Spare Pump, No. and size 2 - 350 G.P.M.

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 6 - 3" I.P.S.

In Holds, &c. Hold 2 - 2-1/2" I.P.S. - Ford Cofferdam - 1 - 4" Main Water Circulating Pump Direct Bilge Suctions, No. and size 1 - 16" Independent Power Pump Direct Suctions to the Engine Room  
 Bilges, No. and size 2 - 5" 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 - How are they protected - No. Valves are fitted are fitted.

What pipes pass through the deep tanks Fore Peak Ballast Suction 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 - Is it fitted with a watertight door - worked from -

**BOILERS, &c.**— (Letter for record) Total Heating Surface of Boilers 18720 lbs. per sq. in.  
 Is Forced Draft fitted Yes No. and Description of Boilers 2 Watertube Working Pressure 685 lbs.  
 Is a Report on Main Boilers now forwarded? Yes  
 Is a Donkey Boiler fitted? No If so, is a report now forwarded? -  
 Plans. Are approved plans forwarded herewith for Shafting No Main Boilers No Auxiliary Boilers - Donkey Boilers -  
 Superheaters No General Pumping Arrangements No Oil Fuel Burning Arrangements No  
 Spare Gear. State the articles supplied:— LP & HP 1st red. pinions, HP & LP quill shafts & coupling hubs.

DELAVAL STEAM TURBINE COMPANY

*[Signature]*

VICE PRESIDENT AND EXECUTIVE ENGINEER Manufacturer

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops - - } March 17, April 18, 20, May 9, June 9, 14, 16, Aug. 4 & 5, 1949.  
 { During erection on board vessel - - } Sept. 1, 27, 28, 29, Oct. 11, 14, 21, 24, 27, Nov. 2, 9, 15, 16, 21, 22, 23, 1949.  
 Total No. of visits 25

Dates of Examination of principal parts—Casings 16th June Rotors 16th June Blading 16 June Gearing 14 June  
 Wheel shaft 14th June Thrust ~~XXXX~~ Collar 14th June Intermediate shafts 28th Feb., '49 Tube shaft - Screw shaft 21st Oct.  
 Propeller 21st Oct. Stern tube 1st Sept. Engine and boiler seatings 22nd Sept. Engine holding down bolts 27th Oct.  
 Completion of pumping arrangements 15th Nov. Boilers fixed 17th Oct. Engines tried under steam 22nd Nov.  
 Main boiler safety valves adjusted 14th Nov. Thickness of adjusting washers Locknuts

Rotor shaft, Material and tensile strength O.H. Steel 106000 L.P. 83750 Identification Mark 5919 CC 1166 JMC  
 Quill Shaft, Material and tensile strength O.H. Steel HP 97500 LP 95000 Identification Mark 7109 WHR 7108 WHI  
 Pinion shaft, Material and tensile strength OH Steel HP " " 121500 HP " " 121500 Identification Mark 8182 JKH 1198 JMC  
 1st Reduction Wheel Shaft, Material and tensile strength O.H. Steel HP 87000 LP 86000 Identification Mark 6211 SS 1205 JMC  
 Wheel shaft, Material O.H. Steel Identification Mark 3765 RK Thrust shaft, Material - Identification Mark -  
 Intermediate shafts, Material O.H. Steel Identification Marks 3864 9161 RK Tube shaft, Material - Identification Marks -  
 Screw shaft, Material O.H. Steel Identification Marks Spare 6410 SS Steam Pipes, Material O.H. Steel Test pressure -

Date of test Various from 5th Aug. to 27th Oct., 1949 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 No If so, have the requirements of the Rules been complied with -  
 Is this machinery a duplicate of a previous case Yes If so, state name of vessel S.S. SOVAC ALADDIN" - Sun hull 571

General Remarks (State quality of workmanship, opinions as to class, &c.) The machinery has been satisfactorily installed on board the vessel, tried out under full power and found satisfactory. In our opinion, the installation is entitled to receive the record of +LMC 11,49, fitted for oil fuel 11,49 F.P. above 150° F. This machinery has been constructed under S.S. and in accordance with the approved plans, the workmanship and materials are good.

Committee's Minute

The amount of Entry Fee	... \$380.00	: When applied for,
Special	... £	: 1st Dec, 49
Donkey Boiler Fee	... £	: per F.A.G.
Travelling Expenses (if any)	£ 70.00	: When received,
		: 19

*[Signature]*  
 Engineer Surveyor to Lloyd's Register of Shipping.

NEW YORK JAN 4 - 1950 *[Signature]*  
 Assigned +LMC 11.49  
 Note CL



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