

FE-3494

# Report on Steam Turbine Machinery.

No. 1972

4a.

of writing Report. 18th June 1956 When handed in at Local Office **OCT. 19 1956** Port of **YOKOHAMA & KOBE** Received at London Office **31 OCT 1956**  
 in Survey held at **Hitachi, Japan** Date, First Survey **28th June 1955** Last Survey **14th April 1956**  
 Book **& Innoshima** (Number of Visits **81 (YKA)**)  
 on the **Single** Screw Vessel **S.S. "Naess Venturer"** Tons (Gross **20873.0**)  
**Hitachi Shipbuilding and Engineering Co., Ltd. Innoshima Shipyard** Yard No. **3777** When built **7Mo. 1956**  
 Engines made at **Hitachi, Japan** By whom made **Hitachi Works, Hitachi Ltd.** Engine No. **M-150** When made **4Mo. 1956**  
 Boilers made at **Hitachi & Yokohama, Japan** By whom made **Hitachi, Yokohama.** Boiler No. **BHC-3172-1** When made **3Mo. 1956**  
 Shaft Horse Power { Maximum **15,000** Owners **Monrovia** Port belonging to **Monrovia**  
 Service **13,500** Is Refrigerating Machinery fitted for cargo purposes **No** Is Electric Light fitted **Yes**  
 N. as per Rule **3,000**  
 made for which Vessel is intended **Ocean going**

**STEAM TURBINE ENGINES, &c.**—Description of Engines **Multistage Impulse Turbine**  
 of Turbines **2** Ahead **1** Direct coupled, **single reduction geared** to Main propelling shafts. No. of primary pinions to each set of reduction gearing **HP-1 LP-1**  
 Direct coupled to **Alternating Current Generator** phase **periods per second** rated **Kilowatts** Volts at **revolutions per minute;**  
 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	H. P.	I. P.	L. P.	ASTERN.
Use	8		8	3
ing				
tion				
ing				
stage				

ft Horse Power at each turbine **H.P. 6,800** **I.P. 8,200** **L.P. 4,257** **1st reduction wheel 743** **main shaft 108.5**  
 or Shaft diameter at journals **H.P. 100mm & 115mm** **I.P. 165mm** **L.P. 165mm** **1st pinion 361.13** **1st reduction wheel 2068.87** **main wheel 4214.76** **Width of 1st reduction wheel LP 275mm x 2**  
 distance between centres of pinion and wheel faces and the centre of the adjacent bearings **1st pinion 405mm** **1st reduction wheel LP 405mm** **main wheel 855mm**  
 Pinion Shafts, diameter at bearings **External 1st LP 140mm** **Internal 1st LP 136mm** **2nd LP 245mm** **diameter at bottom of pinion teeth 1st LP 318.62**  
 Wheel Shafts, diameter at bearings **1st 240mm** **diameter at wheel shroud, 610mm** **Propelling Motor Shaft, diameter at bearings 4228.86**  
 Intermediate Shafts, diameter **as per rule 505mm** **Thrust Shaft, diameter at collars 549.5mm**  
 Propeller Shaft, diameter **as per rule 590mm** **Is the tube screw shaft fitted with a continuous liner Yes**  
 Bronze Liners, thickness in way of bushes **as per rule 32.75mm** **Thickness between bushes 31.75mm** **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**  
 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  
 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**  
 If so, state type **Length of Bearing in Stern Bush next to and supporting propeller 2,397mm**  
 Propeller, diameter **6,800mm** Pitch **4,630mm** No. of Blades **5** State whether Moveable **Solid** Total Developed Surface **235** square feet.  
 Single Screw, are arrangements made so that steam can be led direct to the L.P. Turbine **Yes** Can the H.P. or I.P. Turbines exhaust direct to the  
 condenser **Yes** No. of Turbines fitted with astern wheels **1** Feed Pumps { No. and size **2-@35T/H. 60 kgs/cm<sup>2</sup>**  
 How driven **st. turbine driven**  
 Pumps connected to the Main Bilge Line { No. and size **1-15 M<sup>3</sup>/H 35M 1-160M<sup>3</sup>/H. 25M, 1-160M<sup>3</sup>/H, 35H**  
 How driven **Electric motor driven**  
 Main Pumps, No. and size **Eng Room 1-160M<sup>3</sup>/H 25M 1-160M<sup>3</sup>/H 35M, Lubricating Oil Pumps, including Spare Pump, No. and size 2-@140M<sup>3</sup>/H 35M**  
 two independent means arranged for circulating water through the Oil Cooler **Branch Bilge Suctions, No. and size:—In Engine**  
 Boiler Rooms **3-@2"d, 3-@4"d, 1-5"d, 1-6"d.** In Pump Room **Main P.R. 1-@4"d, 1-2"d, 1-2"d. Aux. P.R. 1-2"d.**  
 Holds, &c. **Bosn store 1-2", chain locker 1-2", coeff. 10/102 2-2 1/2", Gen. cargo space 2-@2" coeff. 53/54 1-2", coeff. 29/30 1-2"**  
 in Water Circulating Pump Direct Bilge Suctions, No. and size **1-18"d.** Direct Bilge Suctions to the Engine and/or Boiler Room  
 pipes, No. and size **1-6"d, 1-2"d, DIRECT** Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes  
 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  
 all Sea Connections fitted direct on the skin of the ship **Yes** Are they fitted with Valves or Cocks **Yes**  
 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  
 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**  
 at pipes pass through the deep tanks **Have they been tested as per rule**  
 all Pipes, Cocks, Valves and Pumps in connection with the machinery and all boiler mountings accessible at all times **Yes**  
 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

**HEATERS, &c.**—Total Heating Surface of Boilers **Boiler 8520 x 2 = 17040 ft<sup>2</sup> Super 1300 x 2 = 2600 ft<sup>2</sup> Econo. 4978x2=9956 ft<sup>2</sup>**  
 Forced Draught fitted **Yes** No. and Description of Boilers **2-Babcock & Wilcox Integral Furnace** Working Pressure **700lb/in<sup>2</sup>**  
 Report on Main Boilers now forwarded? **Yes** Type

012/24-02/28-0460

Lloyd's Register Foundation

Is  a Donkey Boiler fitted?  No  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 17-9-55 Main Boilers 10-5-55 Auxiliary Boilers - Donkey Boilers -

Superheaters Kob. 10-5-55 General Pumping Arrangements Kob 23-3-56 Oil Fuel Burning Arrangements Kob 14-1-56

Geared turbines situated aft:  Have torsional vibration characteristics of system been approved. Yes Date of approval 5-10-55

**SPARE GEAR.**

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

State the principal additional spare gear supplied. Each type of labyrinth rings.  
Bolts, reamer bolts and nuts for turbine casings and couplings.  
Condenser tubes 111 pcs.

*for 105 RPM  
108.5 mm*

The foregoing is a correct description. S. Akamatsu S. Akamatsu, Manager, Innoshima Shipyard  
C. Morita ASSISTANT MANAGER, HITACHI WORKS, HITACHI LTD. Manufacturer

Dates of Survey while building: During progress of work in shops - 1955: June 28, 30, July 7, 9, 12, 14, 19, 22, 26, 28, 30, Aug. 2, 6, 9, 11, 13, 16, 18, 20, 23, 27, 30, Sept. 3, 6, 10, 13, 17, 20, 24, 28, 30, Oct. 1, 4, 8, 12, 15, 19, 23, 27, 30, Nov. 2, 5, 9, 13, 17, 21, 25, 29, Dec. 2, 5, 9, 12, 16, 20, 23, 27, 1956: Jan. 4, 6, 9, 11, 13, 15, 18, 20, 23, 27, Feb. 1, 10, 13, 15, 17, 20, 29, Mar. 2, April 14.

Dates of Examination of principal parts: Casings HP 19-12-55 LP 7-12-55 Rotors HP 18-11-55 LP 5-12-55 Blading HP 18-11-55 LP 5-12-55 Gearing 1st LP 13-2-56 2nd LP 13-2-56

Wheel shaft 1st LP 16-11-55 LP 21-11-55 Thrust shaft 9-1-56 Intermediate shafts 14-4-56 Tube shaft - Screw shaft 14-4-56

Propeller 17-4-56 Stern tube 1-4-56 Engine and boiler seatings 10-5-56 Engine holding down bolts 25-5-56

Completion of fitting sea connections 22-4-56 Completion of pumping arrangements 16-7-56 Boilers fixed 25-5-56 Engines tried under steam 25-7-56

Main boiler safety valves adjusted 16-7-56 Thickness of adjusting washers Drum 20mm Sup. 16mm

Rotor shaft, Material and tensile strength HP Ni. Cr. Mo. V Steel L. 51.8 T. 52.0 R. 51.2 LP Ni. Cr. Mo. V Steel Top L. 49.8 T. 49.8 R. 49.2 Bot. L. 52.0 T. 51.8 R. 49.4 T/in<sup>2</sup> HP Y-6907 LP Y-6782

Flexible Pinion Shaft, Material and tensile strength LP 1st Ni. Cr. Mo Steel T. 55.0 B. 56.0 T/in<sup>2</sup> Identification Mark Y-7028

Pinion shaft, Material and tensile strength Pinion HP Ni. Cr. Mo. STL 552 552 568 2nd HP Ni. Cr. Mo. STL 562 536 562 566 T/in<sup>2</sup> Identification Mark 1st LP Y-7021B 2nd LP Y-7021A

Chemical analysis: 1st P. HP C Si Mn P S Ni Cr Mo 0.31 0.24 0.60 0.015 0.011 1.60 1.12 0.25 2nd P. LP C Si Mn P S Ni Cr Mo 0.30 0.24 0.59 0.014 0.010 1.65 0.97 0.27

If Pinion Shafts are made of special steel state date of approval of chemical analyses, physical properties and heat treatment 6-10-55

1st Reduction Wheel Shaft, Material and tensile strength HP Ni. Cr. Mo Steel T. 52.2 B. 54.0 LP Ni. Cr. Mo Steel T. 53.4 B. 54.8 T/in<sup>2</sup> Identification Mark HP Y-7022 A LP Y-7022 B

Wheel shaft, Material carbon steel Identification Mark Y-6983 Thrust shaft, Material carbon steel Identification Mark Y-6996

Intermediate shafts, Material F.S. Identification Marks HLF-573 NAG-990 Tube shaft, Material - Identification Marks -

Screw shaft, Material F.S. Identification Marks No. 991 Steam Pipes, Material Ca-moly. steel Test pressure 92.5kgs/cm<sup>2</sup>

Date of test 16-5-56, 20-6-56 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

Full description of Fire Extinguishing Apparatus fitted in machinery spaces *X 2*

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 Yes If so, state name of vessel "ALEXANDRA -1"

**General Remarks.** (State quality of workmanship, opinions as to class, &c.) This Turbine has been constructed under the supervision of the Society's Surveyors in accordance with the Society's Rules, the Approved Plans, and the Secretary's Letters.

The workmanship and materials have been found satisfactory. The turbine has been tested in the shop under no load condition and found in good order.

It is submitted that this engine is eligible for classification with this Society with the notation of **+LMC** when satisfactorily installed in the vessel.

These Boilers and Machineries have been placed on board the ship in accordance with the Rules, Approved Plans and Secretary's Letters. On completion of installation, appliances were satisfactorily tried under full working condition and are eligible in our opinion for classification with the records of **+L.M.C. 7,56 B.S. 7,56 sps. 7,56.**

A notice board has been fitted and the tachometer marked warning against continuous operation of the engine between **37 and 42 R.P.M.**

*BSE noted 16.11.56* Confirmation of BSR

The amount of Entry Fee ... £ 376,000.- When applied for 5th July 19 56

Special ... £ : : When received

Donkey Boiler Fee ... £ : : When received

Travelling Expenses (if any) £ : : 19 **OCT. 19 1956**

Committee's Minute *(Installations) 376,000*

Assigned **+LMC 7 56 (with Tach. End<sup>g</sup>)**

*Hamada*  
*Shunji W. Hamada*  
Engineer Surveyor to Lloyd's Register of Shipping



Certificate (if required) to be sent to the Secretary of the Society for Committee's Minute.