

# Report on Steam Turbine Machinery. No. 548

(See Rpt 4a-1 attached hereto)

Received at London Office 12 MAR 1952

Report 25th Sept 51. When handed in at Local Office 25th Sept., 51 Port of Yokohama  
 Survey held at Tokyo, Japan. Date, First Survey 14th Jan., '51 Last Survey 15-15th October, 19 51.  
 (Number of Visits 72)  
 on the Steel Twin Screw Steam Ship "TONAN MARU" Tons Gross 19328.28  
 OSAKA Aioi, Japan By whom built OSAKA IRON WORKS, LTD. When built 1933-10 mo.  
 made at Tokyo, Japan By whom made Ishikawajima Hvy. Ind. Ltd. Engine No. IT 2168 When made 1951 6 mo.  
 made at Aioi, Japan By whom made Harima Shipbuilding Engineering Co. Ltd. (for Port Engine) Boiler No. 8733-8734 When made 10-1951  
 Horse Power at Full Power 4000 Owners Nippon Suisan K.K. Port belonging to Tokyo  
 Horse Power as per Rule 708.686 800 Is Refrigerating Machinery fitted for cargo purposes yes Is Electric Light fitted yes  
 for which Vessel is intended Ocean going

## TURBINE ENGINES, &c.—Description of Engines Impulse type, H.P. & L.P. Turbine, Port Engine

Ahead 2 Direct coupled  
 turbines Astern 2 single reduction geared to Main propelling shafts. No. of primary pinions to each set of reduction gearing 2  
 coupled to Alternating Current Generator phase periods per second rated Kilowatts Volts at revolutions per minute;  
 Main driving power for driving Propelling Motors, Type  
 Kilowatts Volts at revolutions per minute. Direct coupled, single or double reduction geared to propelling shafts.

	H. P.	I. P.	L. P.	ASTERN.
No. of rows	8 rows		6 rows	HP 2 row LP 2 row
No. of stages				
No. of rows in each stage				

Horse Power at each turbine  
 H.P. 2000 I.P. 5444 1st reduction wheel 839  
 L.P. 2000 I.P. 4408 main shaft 125  
 Pitch Circle Diameter  
 HP 140 1st pinion LP 230.23 reduction wheel HP 1247.72 1st reduction wheel 165 x 2  
 LP 180 2nd pinion 411.46 main wheel 2761.66 Face main wheel 350 x 2  
 between centres of pinion and wheel faces and the centre of the adjacent bearings  
 1st pinion HP 720 HP 540 1st reduction wheel LP 700  
 2nd pinion HP 1586.56 HP 1240 main wheel 1270  
 LP 1586.56 LP 1240 1st LP 181.58  
 Pinion diameter 1st HP 130 Pinion Shafts, diameter at bearings External 1st 120 LP 240 diameter at bottom of pinion teeth 2nd 395.36  
 2nd LP 130 Internal 1st 1170 Generator Shaft, diameter at bearings  
 2nd 1135  
 Shafts, diameter at bearings 1st 240 diameter at wheel shroud, 1st 2630 Propelling Motor Shaft, diameter at bearings  
 main 385  
 Intermediate Shafts, diameter as per rule 12.6398" as fitted 12.8347" Thrust Shaft, diameter at collars as per rule 13.9374" as fitted 385, 340 mm.  
 Shaft, diameter as per rule 14.5669" (old) Is the tube screw shaft fitted with a continuous liner yes  
 as fitted 0.7246" Thickness between bushes as per rule 0.5435" Is the after end of the liner made watertight in the  
 as fitted 0.8661" 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 so, state type Is an approved Oil Gland or other appliance fitted at the after end of the tube  
 Length of Bearing in Stern Bush next to and supporting propeller 59.0552"  
 Pitch 3750 mm. No. of Bades 4 State whether Moveable movable Total Developed Surface 78.2 square feet.  
 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  
 No. of Turbines fitted with astern wheels 2 Feed Pumps No. and size 3 sets. 50M<sup>3</sup>/Hr x 280 M (Head)  
 How driven Impulse Turbine driven.

Connected to the Main Bilge Line No. and size How driven  
 Pumps, No. and size Lubricating Oil Pumps, including Spare Pump, No. and size  
 independent means arranged for circulating water through the Oil Cooler Suctions, connected both to Main Bilge Pumps and Auxiliary  
 pumps, No. and size:—In Engine and Boiler Room In Pump Room  
 s, &c.  
 Water Circulating Pump Direct Bilge Suctions, No. and size Independent Power Pump Direct Suctions to the Engine Room  
 No. and size Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes.  
 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.  
 Sea Connections fitted direct on the skin of the ship. Are they fitted with Valves or Cocks.  
 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  
 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  
 plate. What pipes pass through the bunkers. How are they protected.  
 Pipes pass through the deep tanks. Have they been tested as per rule.  
 Pipes, Cocks, Valves and Pumps in connection with the machinery and all boiler mountings accessible at all times.  
 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  
 or from one compartment to another. Is the Shaft Tunnel watertight. Is it fitted with a watertight door. worked from.

RS, &c.—(Letter for record) Total Heating Surface of Boilers  
 ed Draft fitted. No. and Description of Boilers Working Pressure  
 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

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 Yes

State the principal additional spare gear supplied

Bearing bushes for each reduction gear and rotor, each set of pads for main shaft and turbine shaft, Studs, reamer bolts and nuts for jointing of turbine casings. Bolt, reamer bolts, studs & nuts for joint of turbine casing

The foregoing is a correct description, M. Yoshikawa Takes Nawano

Dates of Survey while building During progress of work in shops - 1951: Jan., 14, 28, Feb., 4, 10, 16, 19, March. 15, 20, 26, 28, 30, April. 4, 9, 17, 24, 28, May. 15, 19, 23, 28, 31 June. 8, 20, 28, 29, 30. During erection on board vessel - Total No. of visits

Dates of Examination of principal parts - Casings HP 19.23-5-51 24-4-51 (HP) LP 9-5-51 Rotors 4-5-51 (LP) Blading HP & LP 20-6-51 Gearing 8-6-51

Wheel shaft 1st 4-6-51 Thrust shaft 31-5-51 Intermediate shafts 19-7-51 Tube shaft - Screw shaft 19-7-51

Propeller 14-7-51 Stern tube 31-5-51 Engine and boiler seatings 7-8-51 Engine holding down bolts 7-8-51

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 Open Hearth Forged Steel HP 40.1-41.2 LP 39.0-40.2 Identification Mark HP, Y-1335A

Flexible Pinion Shaft, Material and tensile strength Ni-Cr-Steel HP 43.86 - 44.84 LP 43.08 - 44.84 Identification Mark HP, Y-1455A

Pinion shaft, Material and tensile strength 1st pinion HP 41.7-40.9 LP 41.7-41.3 2nd pinion HP 46.46-45.29 LP 40.51-40.51 Identification Mark HP Y-1461

2nd pinion HP 1459-C rim LP 1459-B; Chemical analysis 1st. C. 0.27 P. 0.017 2nd. B. Ni. 3.53 C. 0.29 P. 0.012 S. 0.014 C. Ni. 3.47 C. 0.28 P. 0.016 S. 0.014

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 Open Hearth Steel HP. 35.7 LP. 35.7 Identification Mark HP Y-870A LP Y-870B

Wheel shaft, Material Open Hearth Steel Identification Mark Y-1351-A Thrust shaft, Material Open Hearth Steel Identification Mark Y-17

Intermediate shafts, Material O. H. S. Identification Marks K-F 748-1 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 No If so, state name of vessel

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 Rules and approved plans, the quality of workmanship and materials has been found satisfactory.

The turbine is intended for installation in Tonan-Maru, now under reconstruction at the Shipbuilding Works, Aioi.

It is submitted that this machinery is eligible to be classed with this Society with notation of B5\* LMC when satisfactorily installed in the vessel.

The machinery has now been satisfactorily installed on board and tested under full power.

The amount of Entry Fee ... £ 478.950: When applied for Special ... £ : : 19 Donkey Boiler Fee ... £ : : When received Travelling Expenses (if any) £ : : 19

Committee's Minute

Assigned

Engineer Surveyor to Lloyd's Register of Shipping.



© 2021

Lloyd's Register Foundation