

# REPORT ON STEAM TURBINE MACHINERY. No. 241

Received at London Office **12 AUG 1950**

Writing Report: 28/7/1950 When handed in at Local Office: 28/7/1950 Port of: Yokohama  
 Survey held at: Yokohama Date, First Survey: 14th April Last Survey: 12th May 1950  
 Book supplement on the: **S.S. Fuji Maru.** (Number of Visits: ) Tons: {Gross: 3629 Net: 1995  
 By whom built: Nippon Steel Tube Co. Yard No.: When built: 1949 7  
 By whom made: Hitachi Works, Hitachi Ltd Engine No.: M-112 When made: 21-4-1949  
 By whom made: Hitachi Works Boiler No.: When made: 3-1949  
 Owners: Nippon Yusosen K.K. Port belonging to: Tokyo  
 Is Refrigerating Machinery fitted for cargo purposes: No Electric Light fitted: Yes  
 for which Vessel is intended: **MN 602**

## 4M TURBINE ENGINES, &c.—Description of Engines Impulse type with double reduction gear

Turbines: Ahead 1xHP 1xLP ~~Direct-coupled~~ } to Single propelling shafts. No. of primary pinions to each set of reduction gearing: 2xHP 2xLP  
 Astern 1xHP 1xLP ~~single reduction geared~~ }  
 double reduction geared }  
 Coupled to: Alternating Current Generator phase: periods per second: rated: Kilowatts: Volts at: revolutions per minute;  
 Direct Current Generator }  
 Propelling power for driving: Propelling Motors, Type: Kilowatts: Volts at: revolutions per minute. Direct coupled, single or double reduction geared to: propelling shafts.

TURBINE DESIGN.	H. P.			I. P.			L. P.			ASTERN.			
	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.	
EXPANSION	20	32	627.639	2			27	984	1	24	36	581 593	2
"	20		577	1			38	1003	1	53/42	85/75	865.5 987	2
"	25		587	1			54	1031	1				
"	31		599	1			70	1059	1				
"	35		607	1			97	1094	1				
"							145	1152	1				

Horse Power at each turbine: {H.P. 1200 I.P. 5744 L.P. 1200 } Revolutions per minute, at full power, of each Turbine Shaft: {H.P. 1200 I.P. 3864 L.P. 3864 }  
 Shaft diameter at journals: {H.P. 120mm I.P. 120mm L.P. 120mm } Pitch Circle Diameter: {1st pinion LP 175 HP 135 2nd pinion LP 389.966 HP 305.044 } Width of Face: {1st reduction wheel LP 200x2 main wheel 365x2 }  
 Distance between centres of pinion and wheel faces and the centre of the adjacent bearings: {1st pinion LP 275 HP 240 2nd pinion LP 555 HP 555 } diameter at bottom of pinion teeth: {1st LP 166.2 HP 126.2 2nd LP 284.4 HP 289.4 }

Pinion diameter: {1st 110 2nd 110 } Pinion Shafts, diameter at bearings: {1st LP 160 HP 160 } diameter at wheel shroud: {1st LP 1066 HP 921 } Generator Shaft, diameter at bearings: -  
 Intermediate Shafts, diameter as per rule: 277mm as fitted: 285 } Thrust Shaft, diameter at collars as per rule: 291 as fitted: 315 } Propelling Motor Shaft, diameter at bearings: -  
 Shaft, diameter as per rule: 309 as fitted: 314 } If the tube screw } shaft fitted with a continuous liner: Yes } Bronze Liners, thickness in way of bushes as per rule: 16.97 as fitted: 18

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 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 material insoluble in water and non-corrosive: Yes } If two liners are fitted, is the shaft lapped or protected between the liners: - } Is an approved Oil Gland appliance fitted at the after end of the tube shaft: No } Length of Bearing in Stern Bush next to and supporting propeller: 640  
 Propeller, diameter: 4500 Pitch: 3450 No. of Blades: 4 State whether Moveable: Yes } Total Developed Surface: 68.4 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. Turbine exhaust direct to the Direct to condenser through pipe: No. of Turbines fitted with astern wheels: 2 } Feed Pumps: {No. and size: 2 sets 20m<sup>3</sup>/h 250m head How driven: Steam weir type }

Is the Main Bilge Line connected to the Main Bilge Line: {No. and size: 1-15 T/h, 1-60 T/h, 1-180 T/h How driven: Main engine contained and or steam driven. }  
 Oil Pumps, No. and size: 1 set 180m<sup>3</sup>/h 20m head Lubricating Oil Pumps, including Spare Pump, No. and size: 2 sets 45m<sup>3</sup>/h 25m head  
 Are 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, 180 M<sup>3</sup>/H 20M head, 60M<sup>3</sup>/H 20M head, 15M<sup>3</sup>/H 30M head  
 Holders, &c. No. 3 180mm

Water Circulating Pump Direct Bilge Suctions, No. and size: 1, 300mm } Independent Power Pump Direct Suctions to the Engine Room: No. and size: 1-80mm 2-130mm } Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes: Yes }  
 Are 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 Sea Connections fitted direct on the skin of the ship: Yes } Are they fitted with Valves or Cocks: Yes }  
 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: above }  
 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 }  
 How are they protected: by steel plate cover }  
 How are they protected: by steel plate cover }  
 Have they been tested as per rule: Yes }  
 Are 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: Yes } worked from upper deck

BOILERS, &c.— (Letter for record.....) Total Heating Surface of Boilers 2x320m<sup>2</sup>

Is Forced Draft fitted..... Yes..... No. and Description of Boilers 2x3 drums water tube boiler Working Pressure 20kg

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 Yes Main Boilers Yes Auxiliary Boilers Donkey Boilers

Superheaters Yes General Pumping Arrangements Yes Oil Fuel Burning Arrangements

Spare Gear. State the articles supplied:—

Screw propeller 2 coupling bolt.  
 Turbine 1 set of springs for relief valve, 5 per cent of bolts and nuts of each size of turbine gear, 1 set of thrust pads and liners for turbine and main thrust bearings. 1 set of bolts and nuts for turbine and gear bearings, 1 set of each size of bearing brasses for turbine and gear. 1 set of coupling bolts. 1 set of labyrinth gland packings for turbine. 1 set of bolts and nuts for turbine and gear bearings.

Boiler Feed check valve-2, Tube stopper-16, Fire bar-138, bolt nut and stud-1 set, plate and 1 set, 1 set of valves, piston and plunger rings of each kind of pumps.

The foregoing is a correct description,

Dates of Survey while building { During progress of work in shops - - }  
 { During erection on board vessel - - }  
 Total No. of visits

Dates of Examination of principal parts—Casings 15-4-50 Rotors 15-4-50 Blading 15-4-50 Gearing 15-4-50

Wheel shaft 15-4-50 Thrust shaft 15-4-50 Intermediate shafts 29-4-50 Tube shaft 29-4-50 Screw shaft 29-4-50

Propeller 29-4-50 Stern tube 29-4-50 Engine and boiler seatings 2-5-50 Engine holding down bolts 2-5-50

Completion of pumping arrangements 15-4-50 Boilers forced fired 15-4-50 Engines tried under steam 11-5-50  
 Main boiler safety valves adjusted 11-5-50 Thickness of adjusting washers 65mm

Rotor shaft, Material and tensile strength Forged Ni-Cr Steel min. 70kg/mm<sup>2</sup> Identification Mark

Flexible Pinion Shaft, Material and tensile strength Forged Cr-Mo Steel min. 70kg/mm<sup>2</sup> (99500lbs/σ<sup>2</sup>) Identification Mark

Pinion shaft, Material and tensile strength HP&LP 1st Pinion Forged Ni-Cr Steel min 70kg/cm<sup>2</sup> Identification Mark

1st Reduction Wheel Shaft, Material and tensile strength HP&LP 2nd Pinion Forged Steel min 60kg/mm<sup>2</sup> (99500lbs/σ<sup>2</sup>) Identification Mark

Wheel shaft, Material Forged steel Identification Mark Thrust shaft, Material Forged steel Identification Mark

Intermediate shafts, Material Forged steel Identification Marks NR 16 3335, 3336, 3337, 3338, 3346 Tube shaft, Material Identification Marks

Screw shaft, Material Forged steel Identification Marks NR 16 3347 Steam Pipes, Material Steel Test pressure 850 lbs

Date of test 5-31-49 Is an installation fitted for burning oil fuel No

Is the flash point of the oil to be used over 150°F. over Have the requirements of the Rules for the use of oil as fuel been complied with No

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 If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c. This vessel was built in 1949 and is now submitted for classification with this Society in accordance with the Rules for vessels not built under survey, the machinery has been opened up and examined in entirety, scantlings checked and found to be in accordance with approved plans and the Rules, the workmanship and materials found satisfactory.

It is submitted that the machinery of this vessel be recommended for the record of LMC 5 and notation TSCL 4,50.

The amount of Entry Fee	£ 160,640	When applied for,
Special	£ :	19
Donkey Boiler Fee	£ :	When received,
Travelling Expenses (if any)	£ 5,000	19

*Robert James Macpherson*  
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

FRI. 10 NOV 1950

Assigned LMC 5.50 Subject  
 S(CL) 7.50  
 F.D. 2 WTB 28416. Spl-



The Surveyors are requested not to write on or below the space for Committee's Minute.