

Rpt. 4b

Date of writing report 27th September, 1960.

Received London

Port KOBE

No. FE-8236

Survey held at Tamano, Japan

In shops 85
No. of visits 14
On vessel

21st Jan., 1960

12th Aug., 1960.

First date 26th May, 1960.

Last date 22nd Aug., 1960.

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name **M.V. "NAGAOSAN MARU"** Gross tons **6554.8**

Owners **Mitsui Steamship Co., Ltd.** Managers Port of Registry **Tokyo**

Hull built at **Tamano, Japan** By **Mitsui Shipbuilding & Eng. Co., Ltd.** Yard No. **641** Year Month **1960-8**

Main Engines made at **- do -** By **- do -** Eng. No. **817** When **1960-8**

Gearing made at **-** By **-**

Donkey boilers made at **Tamano, Japan** By **Mitsui Shipbuilding & Eng. Co., Ltd.** Blr. Nos. **467** When **1960-8**

Machinery installed at **- do -** By **- do -** When **1960-8**

Particulars of restricted service of ship, if limited for classification **None**

Particulars of vegetable or similar cargo oil notation, if required **Not required.**

Is ship to be classed for navigation in ice? **No** Is ship intended to carry petroleum in bulk? **No**

Is refrigerating machinery fitted? **Yes** If so, is it for cargo purposes? **Yes** Type of refrigerant **Freon direct expansion type**

Is the refrigerating machinery compartment isolated from the propelling machinery space? **Yes** Is the refrigerated cargo installation intended to be classed? **Yes**

The following particulars should be given as fully and as clearly as possible. Where the answer is "No" or "None", say so! Ticks and other signs of doubtful meaning are not to be used. Where the wording is not applicable to the installation, a black line may be inserted. If the main engines have been constructed at another port and are covered by a separate report, the particulars given in that report need not be repeated below, but the port and report number should be stated.

No. of main engines **1** No. of propellers **1** Brief description of propulsion system **Reciprocating engine directly compled to line shafting**

MAIN RECIPROCATING ENGINES. Licence Name and Type No. **Mitsui B&W D.E. 662VT2BF140 Type 1 set**

No. of cylinders per engine **6** Dia. of cylinders **620 mm.** stroke(s) **1400 mm.** 2 or 4 stroke cycle **2** Single or double acting **single**

Maximum approved BHP per engine **6500** at **135** RPM of engine and **135** RPM of propeller.

Corresponding MIP **9.5 kg/cm²** (For DA engines give MIP top & bottom) Maximum cylinder pressure **65 kg/cm²** Machinery numeral **1300**

Are the cylinders arranged in Vee or other special formation? **No** If so, number of crankshafts per engine **-**

TWO STROKE ENGINES. Is the engine of opposed piston type? **No** If so, how are upper pistons connected to crankshaft? **through valve in the cyl. cover**

Is the exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? **the cyl. cover** No. and type of mechanically driven scavenge pumps or blowers per engine and how driven **None**

No. of exhaust gas driven scavenge blowers per engine **2 sets** Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action? **Yes**

If a stand-by or emergency pump or blower is fitted, state how driven **None** No. of scavenge air coolers **2** Scavenge air pressure at full power **1.75 kg/cm²** Are scavenge manifold explosion relief valves fitted? **Yes**

FOUR STROKE ENGINES. Is the engine supercharged? **-** Are the undersides of the pistons arranged as supercharge pumps? **-** No. of exhaust gas driven blowers per engine **-** No. of supercharge air coolers per engine **-** Supercharge air pressure **-** Can engine operate without supercharger? **-**

TWO ~~STROKE~~ STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel **2** Inlet **-** Exhaust **1** Starting **1** Safety **1**

Material of cylinder covers **Cr. Mo. Cast Steel** Material of piston crowns **Cr. Mo. Cast Steel** Is the engine equipped to operate on heavy fuel oil? **Yes**

Cooling medium for:—Cylinders **Fresh Water** Pistons **Lub. Oil** Fuel valves **Diesel Oil** Overall diameter of piston rod for double acting engines **-**

Is the rod fitted with a sleeve? **No** Is welded construction employed for: Bedplate? **Yes** Frames? **Yes** Entablature? **Yes** Is the crankcase separated from the

underside of pistons? **Yes** Is the engine of crosshead or trunk piston type? **Cross head** Total internal volume of crankcase **66.5 M³** No. and total area of explosion relief

devices **7-total 3717 cm²** Are flame guards or traps fitted to relief devices? **No** Is the crankcase readily accessible? **Yes** If not, must the engine be removed for

overhaul of bearings, etc? **-** Is the engine secured directly to the tank top or to a built-up seating? **Tank top** How is the engine started? **Compressed air**

Can the engine be directly reversed? **Yes** If not, how is reversing obtained? **-**

Has the engine been tested working in the shop? **Yes** How long at full power? **6 hrs.**

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system **28-3-60** State barred speed range(s), if imposed

for working propeller **None** For spare propeller **None** Is a governor fitted? **Yes** Is a torsional vibration damper or detuner fitted to the shafting? **No**

Where positioned? **-** Type **-** No. of main bearings **8** Are main bearings of ball or roller

type? **No** Distance between inner edges of bearings in way of crank(s) **814.6 mm.** Distance between centre lines of side cranks or eccentrics of opposed piston engines **-**

Crankshaft type: Built, semi-built, solid. (State which) **Built.**

Diameter of journals **520 mm.** Diameter of crankpins **185 mm hole** Centre **520 mm.** Breadth of webs at mid-throw **1120 mm.** Axial thickness of webs **267 mm.**

If shrunk, radial thickness around eyeholes **255.1 mm.** Are dowel pins fitted? **No** Crankshaft material Journals **Forged Steel** Minimum **44 kg/mm²**

Webs **CAST STEEL** Approved **44 kg/mm²** Tensile strength **44 kg/mm²**

Diameter of flywheel **2136 mm.** Weight **2150 kg.** Are balance weights fitted? **No** Total weight **-** Radius of gyration **-**

Diameter of flywheel shaft **500 mm.** Material **Forged Steel** Minimum approved tensile strength **44 kg/mm²**

Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) **Integral with thrust shaft**

29 NOV 1960

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MAIN GAS TURBINES. Name and Type No.

No. of sets of turbines..... Open or closed cycle..... BHP per set..... at..... RPM of output shaft.....

How is drive transmitted to propeller shaft?.....

ARRANGEMENT OF TURBINES. HP drives..... at..... RPM..... HP gas inlet temperature..... pressure.....
(A small diagram should be attached showing gas cycle.)

IP drives..... at..... RPM..... IP gas inlet temperature..... pressure.....

LP drives..... at..... RPM..... LP gas inlet temperature..... pressure.....

No. of air compressors per set..... Centrifugal or axial flow type?..... Material of turbine blades..... Material of compressor blades..... No. of air coolers per set..... No. of heat exchangers per set..... How are turbines started?.....

How is reversing effected?..... Are the turbines operated in conjunction with free piston gas generators?.....

Total No. of free piston gas generators..... Diameter of working pistons..... Diameter of compressor pistons..... No. of double strokes per minute at full power..... Gas delivery pressure..... Gas delivery temperature..... Have the turbines and attached equipment been tested working in the shop?..... How long at full power?.....

ELECTRIC PROPULSION (Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.)

No. of generators..... KW per generator..... at..... RPM..... AC or DC?..... Position.....

No. of propulsion motors..... SHP per motor..... at..... RPM..... Position.....

How is power obtained for excitation of generators?..... Motors?.....

REDUCTION GEARING (Reciprocating engines or gas turbines. A small line sketch should be attached showing arrangement of gearing.)

Is gearing of single or double helical type?..... If single, position of gear thrust bearing..... Is gearing of epicyclic type?.....

PCD of pinions: First reduction..... Second reduction..... PCD of wheels: First reduction..... Main.....

Material of pinions..... Tensile strength..... Material of wheel rims..... Tensile strength.....

Are gear teeth surface hardened?..... How are teeth finished?..... Diameter of pinion journals..... Wheel shaft journals.....

Are the wheels of welded construction?..... Is gearcase of welded construction?..... Has the wheel/gearcase been heat treated on completion of welding?..... Where is the propeller thrust bearing located?..... Are gear bearings of ball or roller type?.....

CLUTCHES, FLEXIBLE COUPLINGS, ETC. If a clutch or other flexible connection is fitted between engine/turbine and gearing or between engine and line shafting give brief description and, for clutches, state how operated.

Can the main engine be used for purposes other than propulsion when declutched?..... If so, what?.....

STRAIGHT SHAFTING. Diameter of thrustshaft..... 500 mm..... Material..... Forged Steel..... Minimum approved tensile strength..... 44 kg/mm².....

Shaft separate or integral with crank or wheel shaft?..... Shaft..... Diameter of intermediate shaft..... 365 mm..... Material..... Forged Steel.....

Minimum approved tensile strength..... 44 kg/mm²..... Diameter of screwshaft cone at large end..... 425 mm..... Is screwshaft fitted with a continuous liner?..... Yes.....

Diameter of tube shaft. (If these are separate shafts)..... Is tube shaft fitted with a continuous liner in way of stern tube..... Thickness of screwshaft liner at bearings..... 25 mm..... Thickness between bearings..... 23.5 mm..... Material of screwshaft..... Forged Steel..... Minimum approved tensile strength..... 44 kg/mm².....

Is an approved oil gland fitted?..... No..... If so, state type..... Length of bearing next to and supporting propeller..... 1900 mm.....

Material of bearing..... Lignumvitae..... In multiple screw vessels is the liner between stern tube and A bracket continuous?..... If not, is the exposed length of shafting between liners readily visible in dry dock?.....

PROPELLER. Diameter of propeller..... 4800 mm..... Pitch..... 3898 mm..... at..... 0.7r..... Built up or solid..... Solid..... Total developed surface..... 8.686 M².....

No. of blades..... 4..... Blade thickness at top of root fillet..... 179.4 mm..... Blade material..... Al-bronze..... Moment of inertia of dry propeller..... 31800 kg-M.....

If propeller is of special design, state type..... Is propeller of reversible pitch type?..... No..... If so, is it of approved design?..... (I=98800kg-cm-sec²).....

State method of control..... Material of spare propeller..... Cast iron..... Moment of inertia..... 38700 kg-M.....

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine..... Can they be declutched?.....

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate)..... 2-240M³/hr. Diesel generator engine, port side engine room floor Kobe, M-65626.....

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate)..... 2-Main 5.5M³, portside aft on partial deck in engine room, Kobe AR-65016. 1-Aux. 0.1M³, port side on engine room floor, Kobe AR-65017.....

How are receivers first charged?..... by hand driven air compressor..... Maximum working pressure of starting air system..... Main, Aux. 25kg/cm²..... Are the safety devices in accordance with the Rules?..... Yes..... Has the starting of the main engines been tested and found satisfactory?..... Yes.....

COOLERS. No. of main engine fresh water coolers..... 1..... No. of main engine lubricating oil coolers..... 1.....

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure..... 2-F.O. settling tanks (Port & Starboard) and 2-F.O. service tanks (Port & Starboard) on partial deck fwd in E.R., 1-Boiler oil service tank, port aft on upper deck in engine room.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose)..... 1-Bilge pump, 1-Sanitary pump.

INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	Service for which each pump is connected to be marked thus X													
	SUCTION							DELIVERY						
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil
Main F.W. E.R. Starboard					X						X			
Cooling pump Motor driven														
Main S.W. - " - Cap. 200M ³ /H		X				X				X				
Cooling pump														
Spare cooling		X			X	X				X	X			
Water pumps E.R. Port														
Aux. F.W. E.R. Port					X						X			
Cooling pump Motor driven														
Aux. S.W. - " -						X				X				
Cooling pump Motor driven														
L.O. Pumps (2) Motor driven								X					X	X
F.O. Transfer P. E.R. Starboard					X							X		
F.O. daily supply P. Motor driven					X							X		
F.O. Circulating P. Fwd in E.R.					X							X		
Fuel valve cool. P. Motor driven					X							X		
Ballast pump E.R. Starboard	X	X	X	X		X				X		X	X	
150M ³ /hr. Motor driven														
G.S. Pump - do -	X	X	X			X				X			X	
150M ³ /hr.														
Bilge pump E.R. Port	X		X											
20M ³ /hr. Motor driven														
Feed water pumps E.R. Aft (up & (2) low), Steam driv.							X		X					
Burning oil pumps E.R. aft. (2) Motor driven					X									

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room. Deep tanks 4-80mm., 2-50mm., No.1 hold 2-80mm., No.2 hold 2-80mm., No.3 hold 2-80mm., No.4 hold 2-80mm., 2-50mm., No.5 hold 2-80mm., 2-50mm., Pipe recess, 1-50mm., 1-80mm.

No. and size connected to main bilge line in main engine room 8-80mm., 1-50mm., 1-125mm., 1-200mm., 1-80mm. in cofferdam, 1-50mm., in tunnel 1-50mm., in cofferdam 1-50mm. in void space. in cofferdam

In aux. engine room..... Size and position of direct bilge suction in machinery spaces 80mm. Port aft

125mm. Starboard aft..... Size and position of emergency bilge suction in machinery spaces 200 mm., port aft

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side?..... No..... Do the piping arrangements comply with the Rules including special requirements for ships carrying..... Yes

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
Forward Inboard in E.R. Port. (No.1)	Oil engine	Mitsui S.B. & Mitsui B&W DE525MTBHK40 Eng. Co. Ltd.	Kobe, 0-65301	22KW A.C. generator and Main air compressor
Forward Outboard in E.R. Port. (No.2)	- do -	- do -	Kobe, 0-65302	- do -
After in E.R. Port. (No.3)	Oil engine	Mitsui B&W DE525MTBHK40 - do -	Kobe, 0-65303	220KW A.C. generator

Is electric current used for essential services at sea?..... Yes..... If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea 1 set 220KW..... Is an electric generator driven by Main Engine?..... No.....

STEAM INSTALLATION. No. of boilers burning oil fuel..... 1..... W.P. 7 kg/cm²..... Type Cochran's oil burning boiler.....

Position Aft on partial deck in engine room.....

Is a superheater fitted?..... No..... Are these boilers also heated by exhaust gas?..... No..... No. of donkey boilers heated by exhaust gas only?..... 1..... W.P. 7 kg/cm².....

Type Bent tube type..... Position in funnel..... Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil fired boilers?..... with oil fired boiler..... Port and No. of report on donkey boiler.....

Aux. Boiler:- Kobe I-65238..... Is steam essential for operation of the ship at sea?..... Yes..... Are any steam pipes over 3 ins. bore?..... Yes..... If so, what is their material?..... Hot drawn steel pipe..... For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules?..... Yes..... No. of oil burning pressure units..... 2..... No. of steam condensers..... 1..... No. of Evaporators..... None.....

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) 1 set-Electric hydraulic type, 1 ram 2 cyls. with 2-Janey oil pumps each driven by 11KW electric motor, capacity 15.0 Ton-M.

Have the Rule Requirements for fire extinguishing arrangements been complied with?..... Yes..... Brief description of arrangements (1) Water service comprising 2 power pumps (2) for hold & machinery space (3) 2-45kg. CO₂ hosereel, 7-litres form (4) 2-hydrants with hoses and spray nozzles (5) 4-80 litres and boxes in engine room (TOTAL FLOODING SYSTEM).....

Has the spare gear required by the Rules been supplied?..... Yes..... Has all the machinery been tried under full working conditions and found satisfactory?..... Yes..... Date and duration of full power sea trials of main engines 20th August, 1960 all day..... Does this machinery installation contain any features of a novel or experimental nature? (Give particulars).....

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration.....

MITSUBISHI STEAM ENGINE WORKS LTD., TAMANO WORKS.

Managing Director.

Builder

Foundation

0115

GENERAL REMARKS

State if the machinery has been constructed and/or installed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship and give recommendations for classification, including any special notation to be assigned. Where existing machinery is submitted for classification the circumstances should be explained as fully as possible.

The Main engine of this vessel has been constructed and installed under Special Survey in accordance with the Rules, approved plans and Secretary's letters.

The workmanship and materials are sound and good.

The machinery has been examined and tested under full load conditions during shop and sea trials and found satisfactory.

In our opinion the machinery of this ship is worthy of the records of +LMC 8,60, Auxiliary Boiler Survey 7 kg/cm² 8,60, Tail Shaft Survey - Continuous Liner - 8,60, Steam Pipe Survey 8,60.

G.M. Kersey & Y. Kojima
Engine Surveyor to Lloyd's Register of Shipping.
G.M. Kersey & Y. Kojima.

PARTICULARS OF IDENTIFICATION MARKS ((Including Port of origin) of important Forgings and Castings. (Copies of certificates should be forwarded with report.)

Connecting rod
RODS LLOYD'S SMK LLOYD'S SMK Piston rod
KOB NO.KT-F1432-1, to 4, KOB NO.KT-F1433-1,2 LLOYD'S YKA
KCI LR 25-3-60 KCI LR 25-3-60 Y-14812-A to G
K.I. LR 7-5-60
A.T.P. 6KG YK LR 30-5-60
CRANKSHAFT ~~NO. KT-F1432-1~~ LLOYD'S KOB NO.KT-CK420 EI LR 30-4-60

FLYWHEEL SHAFT

THRUSTSHAFT LLOYD'S KOB NO.KT-F1481 EI LR 30-4-60

GEARING

INTERMEDIATE SHAFTS LLOYD'S YKA Y-14793, Y-14790-A,B,C,D KI LR 31-3-60

SCREW ~~NO. KT-F1432-1~~ SHAFTS LLOYD'S KOB NO.KT-F1453 EI LR 31-3-60

PROPELLERS LLOYD'S SMK NO.7651 KCI LR 15-4-60

OTHER IMPORTANT ITEMS

Cross head LLOYD'S YKA NO.Y-14802-A to F L.I. LR 30-7-59	Cylinder liner LLOYD'S TEST KOB YK FINISH 12-5-60,16-5-60 WIP 7KG YK LR 16-5-60,18-5-60	Cylinder cover LLOYD'S TEST KOB SMK No.7653 WIP 97.5KG YK AJ 4-6-60,3-5-60,3-6-60 WIP 4KG YK,AJ LR 6-6-60,31-5-60,3-6-60	LLOYD'S TEST KOB SMK NO.7675 WIP 97.5KG YK 8-8-60,9-8-60 WIP 4KG YK LR 9-8-60,11-8-60	Spare screw sha LLOYD'S KOB NO.KT-F1442 EI LR 19-3-60	Spare propeller LLOYD'S SMK NO.7652 KCI LR 16-4-60
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Is the installation a duplicate of a previous case? No

Date of approval of plans for crankshaft 19-2-60

Straight shafting 5-12-59

Gearing

Clutch

Separate oil fuel tanks 22-3-60

Pumping arrangements 27-1-60

Oil fuel arrangements 28-4-60
27-1-60

Cargo oil pumping arrangements

Air receivers Main 16-2-60
Aux. 17-2-59

Donkey boilers 27-4-60

Dates of examination of principal parts:-

Fitting of stern tube 26-5-60

Fitting of propeller 2-6-60

Completion of sea connections 7-6-60

Alignment of crankshaft in main bearings 28-7-60

Engine chocks & bolts 15-7-60

Alignment of gearing

Alignment of straight shafting 28-7-60
8-7-60

Testing of pumping arrangements 18-8-60

Oil fuel lines 8-8-60

Donkey boiler supports 15-7-60

Steering machinery 20-8-60

Windlass 20-8-60

Date of Committee

FRIDAY 10 FEB 1967

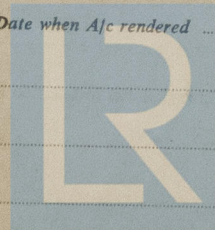
Decision

See Rpt. 1

Special Survey Fee
Construction &
Installation ¥703,150.-

Expenses

Date when A/c rendered



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