

Rpt. 4b

Date of writing report 29th May, 1962.

Received London

Port KOBE

No. FE-10175

Survey held at Aioi, Japan

In shops 196

13-3-1961

21-5-1962

No. of visits

On vessel 27

First date 25-1-1962

Last date 24-5-1962

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name m.v. "LENKORAN" Gross tons 23158.70

Owners "Sudoimport" Moscow, U.S.S.R. Managers Ishikawajima-Harima Heavy Industries

Hull built at Aioi, Japan Port of Registry Odessa Year Month When 1962-5

Main Engines made at - Ditto - By - Ditto - Eng. No. ID208 When 1962-5

Gearing made at - By - Gear No. When

Aux. boilers made at Aioi, Japan By Ishikawajima-Harima Heavy Ind. Co., Ltd., Aioi Works Blr. Nos. B 2162, 2163 When 1962-5

Machinery installed at - Ditto - By - Ditto - When 1962-5

Particulars of restricted service of ship, if limited for classification Oil Tanker

Particulars of vegetable or similar cargo oil notation, if required No

If ship is to be classed for navigation in ice, state whether Class 1, 2 or 3 Yes, Class 3 Is ship an oil tanker? Yes

Is refrigerating machinery fitted? Yes If so, is it for cargo purposes? No Type of refrigerant Dichlorodifluoromethane

Is the refrigerating machinery compartment isolated from the propelling machinery space? Yes Is the refrigerated cargo installation intended to be classed? No

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 report need not be repeated below, but all other relevant particulars must be given and the port and report number should be stated.

No. of main engines 1 No. of propellers 1 Brief description of propulsion system Main Engine coupled with propeller through intermediate & tail shafts

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Crosshead Type, Airless Injection, Exhaust Turbo-charged, Direct Reversible, Marine Diesel Engine, Type 9RD90.

No. of cylinders per engine 9 Dia. of cylinders 900 mm. stroke(s) 1550 mm. 2 or 4 stroke cycle 2 Single or double acting Single

Maximum BHP per engine approved for this installation 18,000 at 119 RPM of engine and 119 RPM of propeller

Corresponding MIP 8.52 Kg/cm<sup>2</sup> (For DA engines give MIP top & bottom) Maximum cylinder pressure 69 Kg/cm<sup>2</sup> Machinery numeral 3,600

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? -

Is the exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? Ports 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 3 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 3 Scavenge air pressure at full power 0.71 Kg/cm<sup>2</sup> Are scavenge manifold explosion relief valves fitted? Yes

TWO ~~STROKE~~ STROKE ENGINES. Is the engine supercharged? Yes Are the undersides of the pistons arranged as supercharge pumps? No No. of exhaust gas driven blowers per engine 3 No. of supercharge air coolers per engine 3 Supercharge air pressure 0.71 Kg/cm<sup>2</sup> Can engine operate without supercharger? Yes

No. of valves per cylinder: Fuel 1 Inlet None Exhaust None Starting 1 Safety 1

Material of cylinder covers Steel Casting Material of piston crowns Steel Casting Is the engine equipped to operate on heavy fuel oil? Yes

Cooling medium for: -Cylinders Fresh Water Pistons Fresh Water Fuel valves Fresh Water Overall diameter of piston rod for double acting engines -

Is the rod fitted with a sleeve? - 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? Crosshead Type Total internal volume of crankcase 157.5 M<sup>3</sup> No. and total area of explosion relief devices 9 x 2,060 CM<sup>2</sup> Are flame guards or traps fitted to relief devices? Yes 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? by compressed air

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

Has the engine been tested working in the shop? Yes How long at full power? 2 hours

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 31-8-61 502 W. 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 11 Are main bearings of ball or roller type? No Distance between inner edges of bearings in way of crank(s) 1,200 mm. Distance between centre lines of side cranks or eccentrics of opposed piston engines -

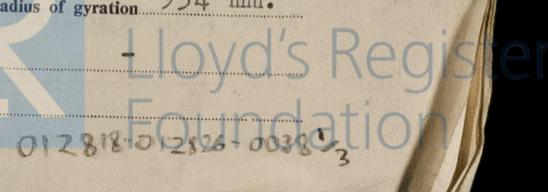
Crankshaft type: Built, semi-built, solid. (State which) Semi-built Diameter of journals 650 mm. Diameter of crankpins 650 mm. Breadth of webs at mid-throw 1037 mm. Axial thickness of webs 405 mm.

If shrunk, radial thickness around eyeholes 287.5 mm. Are dowel pins fitted? No Crankshaft material: Journals Steel Forging Minimum Approved 53.0 Kg/mm<sup>2</sup> Webs Steel Forging Tensile strength

Diameter of flywheel 2558 mm. Weight 1900 Kgs. Are balance weights fitted? Yes Total weight 793 Kgs. Radius of gyration 934 mm.

Diameter of flywheel shaft - Material - Minimum approved tensile strength -

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



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**MAIN GAS TURBINES.** Name and Type No. \_\_\_\_\_ at \_\_\_\_\_ RPM of output shaft

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. State Port and report No.)

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. Full particulars to be reported on Form 4e.) Port \_\_\_\_\_ Report No. \_\_\_\_\_

**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 \_\_\_\_\_ Material \_\_\_\_\_ Steel Forging Minimum approved tensile strength \_\_\_\_\_ 53.0 Kg/mm<sup>2</sup>

Shaft separate or integral with crank or wheel shaft? wheel shaft \_\_\_\_\_ Diameter of intermediate shaft \_\_\_\_\_ 570 mm. Material \_\_\_\_\_ Steel Forging

Minimum approved tensile strength \_\_\_\_\_ 44 Kg/mm<sup>2</sup> Diameter of screwshaft cone at large end \_\_\_\_\_ 635 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 screw/tube shaft liner at bearings \_\_\_\_\_ 33 mm. Thickness between bearings \_\_\_\_\_ 26 mm. How is the after end of the liner made watertight in the propeller boss? rubber packing & gland bush

Material of screw/tube shaft \_\_\_\_\_ Steel Forging Minimum approved tensile strength \_\_\_\_\_ 44 Kg/cm<sup>2</sup> Is an approved oil gland fitted? No If so, state type \_\_\_\_\_

Length of bearing next to and supporting propeller \_\_\_\_\_ 2600 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.** If of special design, state type \_\_\_\_\_ No Is it of reversible pitch type? No

If so, is it of approved design? \_\_\_\_\_ State method of control \_\_\_\_\_

Propeller	Diameter	Pitch	Built or solid	Total developed surface	No. of blades	Blade thickness at top of root fillet	Blade material	Tensile strength	Design moment of inertia of propeller (dry)	For Class 1 or 2 ice strengthening only			Rake of blade	
										Blade thickness at 25% radius	Blade thickness at tip	Length of blade section at 25% radius		
Working	0,200	4880	Solid	20.45	5	236.3mm	Ni-Mn Bronze	58.8	4.454 x	58.5	58.5	58.5	58.5	58.5
Spare	6,200	4880	Solid	20.45	5	259.0mm	Steel Casting	45.5	4.655 x	45.5	45.5	45.5	45.5	45.5

**AIR COMPRESSORS & RECEIVERS.** No. of main engine driven compressors per engine \_\_\_\_\_ None Can they be declutched? \_\_\_\_\_

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) \_\_\_\_\_ 2-500M<sup>3</sup>/hr., Main diesel generator engine, Port inboard & outboard, YKA No. M-7682, 1-10M<sup>3</sup>/Min. Diesel eng., Port., YKA M-7726, 1-60 M<sup>3</sup>/Min., Elect. motor., Port., KOB No. M-75083

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) \_\_\_\_\_ Main, 2-18M<sup>3</sup>, 25Kg/cm<sup>2</sup>, upper eng. Flat Port inboard & outboard No. KOB AR-77090, Aux., 2-200ltr. 25Kg/cm<sup>2</sup>, Port forward & Aft No. KOB AR-76507, G.S. 1-1.5M<sup>3</sup>, 9Kg/cm<sup>2</sup>, Port, Lower eng. Flat No. KOB AR-76508

How are receivers first charged? By diesel eng. driven air compressor Maximum working pressure of starting air system \_\_\_\_\_ 25Kg/cm<sup>2</sup> 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 \_\_\_\_\_ 2-Jacket No. of main engine lubricating oil coolers \_\_\_\_\_ 2-Piston 1-O.F. valve

**OIL FUEL TANKS.** No. and position of oil fuel settling or service tanks not forming part of hull structure \_\_\_\_\_ 2-Bunker oil settling tanks, Starboard fore & aft, upper eng. flat, 2-Bunker oil service tanks, Port & star'd upper eng. flat, 1-diesel oil settling tank, starboard upper eng. flat, 1-diesel oil service tank, Port, upper eng. flat, 1-Kerosene tank, Port, upper eng. flat, 1-Emergency diesel generator O.F. service tank, Port, upper eng. flat, 1-Emergency diesel generator O.F. service tank, Port, upper eng. flat

**MAIN ENGINE DRIVEN PUMPS** (No. and Purpose) \_\_\_\_\_ None

Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	SUCTION										DELIVERY						
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Pump Rm. Bilge	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	Sea
Bilge pump, Tanktop, Star'd Elect. Motor 15M <sup>3</sup> /H	X					X											X
S. & Bilge pumps, Tanktop, Star'd Fwd & Aft, Elect. Motor, 2/H each.	X	X				X					X						X
Bilge & Ballast pump, Fwd pump, Port, Steam, 80M <sup>3</sup> /H.			X			X			X								X
Cooling sea water pump, Tanktop, Star'd, Elect. Motor, 750M <sup>3</sup> /H.					X						X						
Cooling sea water pump, Tanktop, Star'd, Elect. Motor, 650M <sup>3</sup> /H.					X	X					X	X					
Bucket Cooling Fresh water, Tanktop, Star'd, Elect. Motor.					X							X					
Service cooling fresh water pump, Tanktop, Star'd, Elect. Motor.					X	X					X	X					
Ston cooling fresh water pumps, Tanktop, Port, Fwd & Aft, Elect. Motor.					X							X					
Oil pumps, Tanktop, Star'd, Fwd & Aft, Elect. Motor.								X									X
Oil transfer pump, Tanktop, Star'd, Elect. Motor.								X									X
Recharger lub. oil pumps, Tanktop, Star'd, Inboard & outboard, Elect. Motor.								X									X
Fuel booster pumps, Port, Eng. flat, inboard & outboard, Elect. Motor.					X												X
Fuel service pump, Tanktop, Star'd, Elect. Motor.					X												X
Fuel transfer pump, Tanktop, Star'd, Elect. Motor.					X												X
Fuel transfer pump, Fwd, Room, Star'd, Steam.					X												X
Fuel burning pump of boiler, Eng. flat, Port inboard & outboard, Elect. Motor.					X												X
Oil burner																	X
Oil feed pumps, Lower eng. flat, Fwd & Aft, Steam.								X				X					
Gas economiser feed pump, Fwd, Lower eng. Flat, Elect. Motor.								X				X					
Gas economiser water circulator, Star'd lower eng. flat, Elect. Motor.								X				X					
Exh. Gas Economiser. Boiler.																	
Re pumps, Tanktop, Port, Inboard & outboard, Elect. Motor.								X									X

Captain Bridge, Port	40A 501, 170mm x 220mm. Diesel	Mach. Co., Ltd., Sakai Plant.	KOB O-76341	100KVA A.C. Generator
Port in Eng. Room	40A 101, 95mm x 140mm. Diesel	Suction Gas Engineer's Mfg. Co., Ltd.	YKA M-7726	Emergency Air Compressor

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 \_\_\_\_\_ 2 Generators, 340 kW. Is an electric generator driven by Main Engine? No

**STEAM INSTALLATION.** No. of aux. boilers burning oil fuel \_\_\_\_\_ 2 W.P. 16 Kg/cm<sup>2</sup> Type \_\_\_\_\_ Two Drum type Water Tube Boiler (See Circular 2144) Position \_\_\_\_\_ Port & Star'd Boiler Flat in machinery space aft

Is a superheater fitted? No Are these boilers also heated by exhaust gas? No No. of aux./donkey boilers heated by exhaust gas only? 1 W.P. 20 Kg/cm<sup>2</sup>

Type \_\_\_\_\_ water Tubes with fins Position \_\_\_\_\_ Captain bridge, in funnel Can the exhaust heated boilers deliver steam directly to the steam engine or do they operate only as economisers in conjunction with oil fired boilers? Only as economisers in conjunction With oil fired boiler

boilers \_\_\_\_\_ KOB No. FE-10175 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? 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 \_\_\_\_\_ 1

**STEERING GEAR.** (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars including particulars of alternative means of steering) \_\_\_\_\_ 2-Electric Motor driven, "HELESHAW" Type

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements \_\_\_\_\_ 2-150 Ltr. Froth extinguishers, 10-9 Ltr. Froth extinguishers, 3-4.5Kg. CO<sub>2</sub> Extinguishers, 2-150 Ltr. Sand boxes, 5-70mm. Hose couplings and 4-2 1/2" combined jet & spray nozzles with hoses, 27 CO<sub>2</sub> nozzles from ship's CO<sub>2</sub> apparatus, Steam smothering 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 \_\_\_\_\_ None Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) \_\_\_\_\_ None

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics. (Strike out words not applicable.)

S. Minami, ISHIKAWAJIMA-HARIMA HEAVY INDUSTRIES CO., LTD. Builder  
 AIOI WORKS.

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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 built under Special Survey in accordance with the Rules, approved plans and the Secretary's letters.

The materials and workmanship are sound and good.

The machinery has been examined and tested under working condition during shop and sea trial and found satisfactory.

In our opinion this vessel's machinery is worthy to have records of +LMC 5.62  
 Engine Special Survey 5.62, Auxiliary Boiler Survey 16Kg/cm<sup>2</sup> 5.62, Tailshaft Survey -  
 Continuous Liner - 5.62, Steam Pipe Survey 5.62, "Fitted for Oil Fuel."

*Jacobs & Matsumoto*  
 Engineer Surveyors to Lloyd's Register of Shipping.  
 A. Jacobs & S. Matsumoto

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

RODS Piston Rods: YKA No. Y17248A,B Y17255A,B Y17259 SM 4-12-61  
 Connecting Rods: YKA No. Y17232 Y17240A,B Y17254A,B SM 11-12-61  
 CRANKSHAFT OR ROTORSHAFT KOB No. KT-CK475 EI 9-11-61  
 FLYWHEEL SHAFT -  
 THRUSTSHAFT KOB No. KT-F 1746 EI 9-11-61  
 GEARING  
 INTERMEDIATE SHAFTS YKA No. Y 16675 AM 10-11-61  
 SCREW AND TUBE SHAFTS KOB No. KT F1774 EI 18-12-61 Spare: KOB No. KT-F1725 EI 30-9-61  
 PROPELLERS SMK No. 11878 KOI 22-1-62, Spare: SMK No. 12086 KOI 24-4-62  
 OTHER IMPORTANT ITEMS Cylinder Covers: KOB No. H-C866-2-1,3,4,5,6,7,8,9,10 SM 18-12-61  
 Piston Crowns: KOB No. H-C866-3-1,4,5,6,7,8,9,10 871-2-2 SM 7,8,9,11,12-12  
 Crossheads: KOB No. KT-F1627-1, 1641, 1652-1,2,3,4,5 1659-1,2, SM 30-11-61

Is the installation a duplicate of a previous case? Yes If so, state name of vessel m.v. "LISICHANSK" (Yard No. 591)  
 Date of approval of plans for crankshaft 6-2-61 Straight shafting 10-2-61 Gearing - Clutch -  
 Separate oil fuel tanks 5-10-61 Pumping arrangements 1-3-61 Oil fuel arrangements 1-3-61  
 Cargo oil pumping arrangements 7-9-61 Air receivers Main 19-4-61, Aux & GS 13-9-61 Aux. donkey boilers 10-2-61  
 Dates of examination of principal parts:-  
 Fitting of stern tube 12-2-62 Fitting of propeller 14-2-62 Completion of sea connections 21-2-62 Alignment of crankshaft in main bearings 2-4-62  
 Engine chocks & bolts 2-4-62 Alignment of gearing - Alignment of straight shafting 11-4-62 Testing of pumping arrangements 20-4-62  
 Oil fuel lines 6-4-62 Donkey boiler supports 15-3-62 Steering machinery 7-5-62 Windlass 7-5-62

Date of Committee FRIDAY - 3 AUG 1962

Decision +LMCES  
 ABS  
 TS(CL) } 5.62  
 SPS

Special Survey Fee  
 Construction: ¥ 716,900.-  
 Installations: 392,000.-  
 Expenses

