

Rpt. 4b

Date of writing report 25th February, 1962

Received London

Port SHIMONOSEKI

- 4 FEB 1962

Survey held at MITSUBISHI, HIROSHIMA

No. of visits In shops 155 On vessel 25

23rd Jan., 1961

No. FE-1960 9th Nov., 1961

First date 16th Oct., 1961 Last date

23rd Feb., 1962

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name Motor Tanker "LUGANSK"

Gross tons 22,262.48

Managers V/O "SUDOIIMPORT"

Managers

Port of Registry Odessa

Where built at Hiroshima, Japan

By Mitsubishi Shipbuilding & Engineering Co., Ltd., Hiroshima Works

Yard No. S-145

Year Month 2 - 1962

Engines made at Hiroshima, Japan

By Mitsubishi Shipbuilding & Engineering Co., Ltd., Hiroshima Works

Eng. No. 21

When 11 - 1961

Where made at

By Mitsubishi Shipbuilding & Engineering Co., Ltd., Hiroshima Works

Blr. Nos. 88 & 87

When 2 - 1962

Key boilers made at Hiroshima, Japan

By Mitsubishi Shipbuilding & Engineering Co., Ltd., Hiroshima works

When 2 - 1962

Machinery installed at Hiroshima, Japan

Particulars of restricted service of ship, if limited for classification

Particulars of vegetable or similar cargo oil notation, if required

Ship to be classed for navigation in ice? Yes, Class 3

Is ship intended to carry petroleum in bulk? Yes

Refrigerating machinery fitted? Yes

If so, is it for cargo purposes? No (ship use)

Type of refrigerant Freon Gas Direct Expansion Type

Is the refrigerating machinery compartment isolated from the propelling machinery space? No

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 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 oil engine directly coupled to line shaft

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Mitsubishi Hiroshima Sulzer 9RD90 cross-scavenging two-cycle single acting exhaust turbo-charged cross-head type

No. of cylinders per engine 9 Dia. of cylinders 900 mm stroke(s) 1,550 mm 2 or 4 stroke cycle 2 Single or double acting Single

Maximum approved BHP per engine 18,000 at 119 RPM of engine and 119 RPM of propeller.

Maximum responding MIP 8.5 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? Port in cylinder No. and type of mechanically driven scavenge pumps or blowers per engine and how driven 9 - Piston underside scavenging type

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

Is a stand-by or emergency pump or blower fitted, state how driven None No. of scavenge air coolers 3 Scavenge air pressure at full load 0.66 Kg/cm<sup>2</sup> Are scavenge manifold explosion relief valves fitted? Yes

THREE 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 & FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel 1 Inlet None Exhaust None Starting 1 Safety 1

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

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

Is the piston rod fitted with a sleeve? None Is welded construction employed for: Bedplate? Yes Frames? Yes Entablature? - Is the crankcase separated from the underside of pistons? Yes

Is the engine of crosshead or trunk piston type? Crosshead Total internal volume of crankcase 193.3 m<sup>3</sup> No. and total area of explosion relief devices 9 - 18,540 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 haul 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? 2 hrs.

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 25-5-1961 State barred speed range(s), if imposed

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

Are the bearings 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, soild. (State which) Semi-built.

Diameter of journals 650 mm Diameter of crankpins 646 mm Breadth of webs at mid-throw 1,058 mm Axial thickness of webs 405 mm

Material of crank, radial thickness around eyeholes 287.5 mm Are dowel pins fitted? None Crankshaft material Journals Forged steel Approved 50 Kg/mm<sup>2</sup> Webs Forged steel Tensile strength 50 Kg/mm<sup>2</sup>

Diameter of flywheel 2,558 mm Weight 1,900 Kg Are balance weights fitted? Yes Total weight 2,277 Kg Radius of gyration 970 mm

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

Is the flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with thrust shaft

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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 \_\_\_\_\_

minute at full power \_\_\_\_\_ Gas delivery pressure \_\_\_\_\_ Gas delivery temperature \_\_\_\_\_ Have the turbines and attached equipment been tested work 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 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 650 mm Material Forged Steel Minimum approved tensile strength 50 Kg/mm<sup>2</sup>

Shaft separate or integral with crank or wheel shaft? Separate Diameter of intermediate shaft 570 mm Material Forged Steel

Minimum approved tensile strength 45 Kg/mm<sup>2</sup> Diameter of screwshaft cone at large end 625 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 \_\_\_\_\_

bearings 30 mm Thickness between bearings 29 mm Material of screwshaft Forged Steel Minimum approved tensile strength 45

Is an approved oil gland fitted? No If so, state type \_\_\_\_\_ Length of bearing next to and supporting propeller 2,630mm + 800mm

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 6,100 mm Pitch 4,800 mm Built up or solid Solid Total developed surface 19.00 m<sup>2</sup>

No. of blades 5 Blade thickness at top of root fillet 305.5 mm Blade material Manganese Bronze Moment of inertia of dry propeller 461,811 Kg cm<sup>2</sup>

If propeller is of special design, state type \_\_\_\_\_ Is propeller of reversible pitch type? No If so, is it of approved design? \_\_\_\_\_

State method of control \_\_\_\_\_ Material of spare propeller Cast Steel Moment of inertia 468,971 Kg cm<sup>2</sup>

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 Main - 348 m<sup>3</sup>/h x 30 Kg/cm<sup>2</sup>, inner & outer, portside in engine room (Yokohama M-7540); 1 Emergency - 9 m<sup>3</sup>/h x 30 Kg/cm<sup>2</sup>, diesel engine driven in engine room (Yokohama M-7556); 1 Ship Service - 100 m<sup>3</sup>/h x 8.5 Kg/cm<sup>2</sup>, motor driven, port partial deck in engine room (Yokohama M-7568); 1 Control - 70 m<sup>3</sup>/h x 8.5 Kg/cm<sup>2</sup>, motor driven, starb'd partial deck in engine room (Yokohama M-75258)

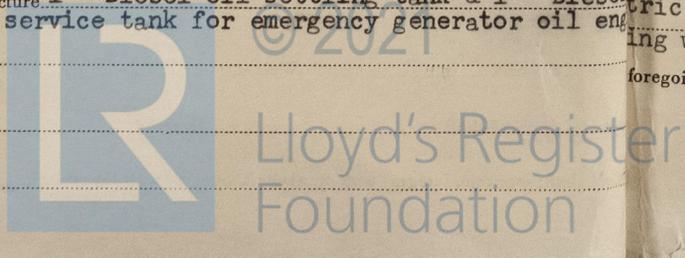
No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Main - 2 x 17 m<sup>3</sup>, in. & out. port side in engine room (Kobe AR-72950); Aux. - 1 x 0.32 m<sup>3</sup>, port lower floor in engine room (Kobe AR-74112); Control Air Bottle - 1 x 0.8 m<sup>3</sup>, starb'd aft partial deck in engine room (Kobe AR-75258); Ship Service Air Bottle - 1 x 1 m<sup>3</sup>, port side in engine room (Kobe AR-75258)

How are receivers first charged? By emergency air compressor Maximum working pressure of starting air system 30 Kg/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 cooler 4 No. of main engine lubricating oil coolers 2

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure. 1 - Diesel oil settling tank & 1 - Diesel oil service tank - starboard 2nd deck in engine room; 1 - Diesel oil service tank for emergency generator oil settling tank - in emergency generator room on boat deck

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 9 - Oil fuel pumps







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 machinery of this ship has been built under special survey in accordance with the Rules, Approved Plans and Secretary's letters. The materials and workmanship are sound and good.

The machinery was examined under working conditions during comprehensive shop and sea trials and found satisfactory.

In our opinion the machinery of this ship is worthy to have records of + LMC 2.62, ABS 2.62 (primary 782 lb/in<sup>2</sup> secondary 228 lb/in<sup>2</sup> exhaust gas economizer 284 lb/in<sup>2</sup>) TS (CL) 2.62 and SPS 2.62.

19kg 270

*Peter Munn*  
*K. Tabuchi*

*J. Nonomura*  
*K. Yamazaki*

*W. P. Blood*

Engineer Surveyor to Lloyd's Register of Shipping

P. Manson, W.A. Cook, J. Nonomura, K. Tabuchi, Y. Kojima, K. Yamazaki

PARTICULARS OF IDENTIFICATION MARKS (Including Port of origin) of important Forgings and Castings. (Copies of certificates should be forwarded with report.)  
Piston rod - Lloyd's SMK Y-15833-A,B, Y-15845-A,B, Y-15846-A,B, Y-16888, Y-16889, Y-16890 KOI LR 24-7-61  
RODS / Connecting rod - Lloyd's SMK Y-15840-A,B, Y-16883, Y-16884, Y-16886, Y-16887, Y-16891, Y-16904, Y-16913 K.T. LR. 12 & 15-9-61

CRANKSHAFT ~~OR ROTOR SHAFT~~ Lloyd's Kob No. KT-CK 461 EI LR 6-7-61

~~WINDMILL SHAFT~~

THRUSTSHAFT Lloyd's Kob No. KT-F1665 EI LR 6-7-61

GEARING

INTERMEDIATE SHAFTS Lloyd's SMK NAG No. 4695 JN B 17-10-61  
Lloyd's SMK NAG No. 4694 JN B 17-10-61

SCREW ~~AND TUBE~~ SHAFTS Lloyd's KOB No. KT-F1681 EI LR 31-7-61

PROPELLERS Lloyd's SMK No. 11621 JN B 9-10-61  
Spare Lloyd's SMK No. 11881 KOI LR 31-1-62

OTHER IMPORTANT ITEMS

Cylinder cover; Lloyd's Test SMK No. 11617-1 to 10 WTP 105 & 6 KG KT 8, 10, 15 & 18-9-61 L.R. YK 8 & 10-1-62 LR.  
Piston crown; Lloyd's Test SMK No. 11616-1 to 10 W.T.P. 20 KGS KOI 4-9-61, K.T. 7, 5, 18 & 21-9-61 YK 17-1-62 LR.  
Crosshead pin; Lloyd's SMK Y-15830-A,B, Y-15831-A,B, Y-15832-A,B, Y-15843-A,B, Y-15844 KOI LR 13 & 24-7-61

Is the installation a duplicate of a previous case? None If so, state name of vessel

Date of approval of plans for crankshaft 20th June, 1961 Straight shafting 5th Apr., 1961 Gearing - Clutch -

Separate oil fuel tanks 6th November, 1961 Pumping arrangements 23rd August, 1961, 25 Oil fuel arrangements S. 15th T.P 2nd Feb

Cargo oil pumping arrangements 16th Aug., 1961, 22nd Apr., 1961, 7th July, 1961 Air receivers 8th & 27th Sept., 1961 Donkey boilers 27th May, 1961, 26th June, 1961

Dates of examination of principal parts:-

Fitting of stern tube 16th Oct., 1961 Fitting of propeller 18th Oct., 1961 Completion of sea connections 27th Oct., 1961 Alignment of crankshaft in main bearings 12th

Engine chocks & bolts 14th Dec., 1961 Alignment of gearing - Alignment of straight shafting 14th Dec., 1961 Testing of pumping arrangements 25

Oil fuel lines 8th & 10th Feb., 1962 Donkey boiler supports 5th Oct., 1961 Steering machinery 10th Feb., 1962 Windlass 10th Feb., 1962

Date of Committee FRIDAY 27 APR 1962

Decision + LMC ES } Construction £740  
ABS } Installation £392  
TS (CL) } 2.62  
SPS }

Expenses £15,000

Date when A/c rendered

Special Survey Fee

Expenses

Construction

Installation

Decision

Date when A/c rendered

Special Survey Fee

Expenses

Construction

Installation

Date when A/c rendered

Special Survey Fee

