

19 FEB 1960

pt. 4b

Date of writing report 15.2.60. Received London \_\_\_\_\_ Port HELSINGFORS No. 7311  
 Ship held at Vasa No. of visits 78 In shops 78 First date 11.12.58 Last date 12.11.59  
 On vessel 78

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

R.B. 19598 Name "LENINGRAD" Gross tons 9425,2  
 Owners U.S.S.R. Managers Wärtsilä-koncernen Ab, Port of Registry Murmansk  
Sandvikens Skeppsdocka.  
 Built at Helsingfors By Wärtsilä-koncernen Ab, Yard No. 366 When 1961-11  
Vasa By Wärtsilä-koncernen Ab, Eng. No. 185 When 1959  
Wasa Mekaniska Verkstad  
 Ring made at \_\_\_\_\_ By \_\_\_\_\_  
 Key boilers made at \_\_\_\_\_ By \_\_\_\_\_ Blr. Nos. \_\_\_\_\_ When \_\_\_\_\_  
 Machinery installed at \_\_\_\_\_ By \_\_\_\_\_ When \_\_\_\_\_

Particulars of restricted service of ship, if limited for classification \_\_\_\_\_  
 Particulars of vegetable or similar cargo oil notation, if required \_\_\_\_\_  
 Is ship to be classed for navigation in ice? \_\_\_\_\_ Is ship intended to carry petroleum in bulk? \_\_\_\_\_  
 Refrigerating machinery fitted? \_\_\_\_\_ If so, is it for cargo purposes? \_\_\_\_\_ Type of refrigerant \_\_\_\_\_  
 Is the refrigerating machinery compartment isolated from the propelling machinery space? \_\_\_\_\_ Is the refrigerated cargo installation intended to be classed? \_\_\_\_\_

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 drawing 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 \_\_\_\_\_ No. of propellers \_\_\_\_\_ Brief description of propulsion system Diesel Electric  
**MAIN RECIPROCATING ENGINES.** Licence Name and Type No. Wärtsilä-Sulzer 9 MH 51/55  
 No. of cylinders per engine 9 Dia. of cylinders 510 mm stroke(s) 550 mm 2 or 4 stroke cycle 2 Single or double acting single  
 Maximum approved BHP per engine 3250 at 330 RPM of engine and \_\_\_\_\_ RPM of propeller.  
 Corresponding MIP 5,3 kg/cm<sup>2</sup> (For DA engines give MIP top & bottom) Maximum cylinder pressure 65 kg/cm<sup>2</sup> Machinery numeral \_\_\_\_\_  
 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 in cyl. No. and type of mechanically driven scavenge pumps or blowers per engine and how driven 9 lever driven scavenge Pumps (piston pumps)  
 No. of exhaust gas driven scavenge blowers per engine \_\_\_\_\_ Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action? \_\_\_\_\_  
 Is a stand-by or emergency pump or blower is fitted, state how driven \_\_\_\_\_ No. of scavenge air coolers \_\_\_\_\_ Scavenge air pressure at full power \_\_\_\_\_  
 Are scavenge manifold explosion relief valves fitted? \_\_\_\_\_

**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 & FOUR STROKE ENGINES—GENERAL.** No. of valves per cylinder: Fuel 1 Inlet \_\_\_\_\_ Exhaust \_\_\_\_\_ Starting 1 Safety 1  
 Material of cylinder covers cast steel Material of piston crowns Forged steel Is the engine equipped to operate on heavy fuel oil? no  
 Lubricating medium for:—Cylinders fresh water Pistons oil 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? no Frames? no Entablature? no Is the crankcase separated from the underside of pistons? no  
 Is the engine of crosshead or trunk piston type? trunk Total internal volume of crankcase 8,5 m<sup>3</sup> No. and total area of explosion relief devices 9 x 250 cm<sup>2</sup> = 2250 cm<sup>2</sup>  
 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? \_\_\_\_\_ How is the engine started? by air

Can the engine be directly reversed? no If not, how is reversing obtained? no reversing required  
 Has the engine been tested working in the shop? yes How long at full power? 8 hours

**CRANK & FLYWHEEL SHAFTING.** Date of approval of torsional vibration characteristics of the propelling machinery system 16.4.57 State barred speed range(s), if imposed 23.4.57  
 Working propeller \_\_\_\_\_ For spare propeller \_\_\_\_\_ 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) 570 mm Distance between centre lines of side cranks or eccentrics of opposed piston engines \_\_\_\_\_  
**CRANKSHAFT TYPE:** Built, semi-built, solid. (State which) solid  
 Diameter of journals 310 mm Diameter of crankpins 120 mm Breadth of webs at mid-throw 450 mm Axial thickness of webs 163 mm  
 Crank, radial thickness around eyeholes \_\_\_\_\_ Are dowel pins fitted? \_\_\_\_\_ Crankshaft material Journals Approved \_\_\_\_\_  
 Webs \_\_\_\_\_ Tensile strength 50 kg/mm<sup>2</sup>  
 Diameter of flywheel \_\_\_\_\_ Weight \_\_\_\_\_ Are balance weights fitted? \_\_\_\_\_ Total weight \_\_\_\_\_ Radius of gyration \_\_\_\_\_  
 Diameter of flywheel shaft \_\_\_\_\_ Material \_\_\_\_\_ Minimum approved tensile strength \_\_\_\_\_  
 Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with crankshaft

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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

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

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 stroke

minute at full power Gas delivery pressure Gas delivery temperature Have the turbines and attached equipment been tested

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

journals Are the wheels of welded construction? Is gearcase of welded construction? Has the wheel/gearcase been heat treated on

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

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 Minimum approved tensile strength

Shaft separate or integral with crank or wheel shaft? Diameter of intermediate shaft Material

Minimum approved tensile strength Diameter of screwshaft cone at large end Is screwshaft fitted with a continuous liner?

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

bearings Thickness between bearings Material of screw/tube shaft Minimum approved tensile strength

Is an approved oil gland fitted? If so, state type Length of bearing next to and supporting propeller

Material of bearing In multiple screw vessels is the liner between stern tube and A bracket continuous? If not, is the exposed length of shafting

liners readily visible in dry dock?

PROPELLER. Diameter of propeller Pitch Built up or solid Total developed surface

No. of blades Blade thickness at top of root fillet Blade material Moment of inertia of dry propeller

If propeller is of special design, state type Is propeller of reversible pitch type? If so, is it of approved design?

State method of control Material of spare propeller Moment of inertia

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)

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate)

How are receivers first charged? Maximum working pressure of starting air system Are the safety devices

in accordance with the Rules? Has the starting of the main engines been tested and found satisfactory?

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

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure

MAIN ENGINE DRIVEN PUMPS (No. and Purpose)

INDEPENDENT PUMPS (Name below essential pumps, state position and low driven. Give capacity of bilge pumps.)

Table with columns for SUCTION (Bilge Main, Bilge Direct, Ballast Main, Oil Fuel, Fresh Water Cooling, Sea, Feed Tanks, Lub. Oil) and DELIVERY (Boiler Feed, Salt Water Cooling, Fresh Water Cooling, Oil Fuel Tanks, Fire Main, Lub. Oil, Piston Cooling). Includes a header 'Service for which each pump is connected to be marked thus X'.

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room

and size connected to main bilge line in main engine room In tunnel

aux. engine room Size and position of direct bilge suction in machinery spaces

Size and position of emergency bilge suction in machinery spaces

the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? Do the piping arrangements comply with the Rules including

special requirements for ships carrying petroleum in bulk, cargo oil or classed for navigation in ice? (strike out words not applicable).

STEAM & OIL ENGINE AUXILIARIES

Table with columns: Position of each, Type, Made by, Port and No. of Rpt. or Cert., Driven Machinery (For electric generators, state output).

electric current used for essential services at sea? If so, state the minimum No. and capacity of generators required in order that the ship may operate

Is an electric generator driven by Main Engine?

STEAM INSTALLATION. No. of donkey boilers burning oil fuel W.P. Type

superheater fitted? Are these boilers also heated by exhaust gas? No. of donkey boilers heated by exhaust gas only? W.P.

Can the exhaust heated boilers deliver steam directly to

steam range or do they operate only as economisers in conjunction with oil fired boilers? Port and No. of report on donkey

Is steam essential for operation of the ship at sea? Are any steam pipes over 3 ins. bore? If so, what is their

material? For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? No. of oil burning pressure

No. of steam condensers No. of Evaporators

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars)

Are the Rule Requirements for fire extinguishing arrangements been complied with? Brief description of arrangements

the spare gear required by the Rules been supplied? Has all the machinery been tried under full working conditions and found satisfactory? Date and duration of full-

sea trials of main engines Does this machinery installation contain any features of a novel or experimental nature? (Give particulars)

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).



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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 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

This Diesel Engine has been constructed under Special Survey in accordance with the Rules, approved plans and Secretary's letters. Quality of materials and workmanship found good.

*J. M. New*  
 Engineer Surveyor to Lloyd's Register of Shipping

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

RODS Lloyd's DSF HS 117 4.9.58 (1 pice) Lloyd's DSF HS 121 4.9.58 ( 3 pice) Lloyd's DSF HS 116 4.9.58 (1 pice)  
 Lloyd's DSF HS 119 4.9.58 (1 pice)

CRANKSHAFT OR ROTORSHAFT

FLYWHEEL SHAFT Lloyd's KLN AS 553 27.11.58 Lloyd's KLN AS 509 27.11.58

THRUSTSHAFT

GEARING

INTERMEDIATE SHAFTS

SCREW AND TUBE SHAFTS

PROPELLERS

OTHER IMPORTANT ITEMS

Is the installation a duplicate of a previous case? yes If so, state name of vessel Yard No. 365. Report No. 6968

Date of approval of plans for crankshaft 6.10.55 Straight shafting \_\_\_\_\_ Gearing \_\_\_\_\_ Clutch \_\_\_\_\_

Separate oil fuel tanks \_\_\_\_\_ Pumping arrangements \_\_\_\_\_ Oil fuel arrangements \_\_\_\_\_

Cargo oil pumping arrangements \_\_\_\_\_ Air receivers \_\_\_\_\_ Donkey boilers \_\_\_\_\_

Dates of examination of principal parts:—

Fitting of stern tube \_\_\_\_\_ Fitting of propeller \_\_\_\_\_ Completion of sea connections \_\_\_\_\_ Alignment of crankshaft in main bearings \_\_\_\_\_

Engine chocks & bolts \_\_\_\_\_ Alignment of gearing \_\_\_\_\_ Alignment of straight shafting \_\_\_\_\_ Testing of pumping arrangements \_\_\_\_\_

Oil fuel lines \_\_\_\_\_ Donkey boiler supports \_\_\_\_\_ Steering machinery \_\_\_\_\_ Windlass \_\_\_\_\_

Date of Committee FRIDAY 16 FEB 1962 Special Survey Fee Fmk. 267.00

Decision See Hfs 8382

Expenses Fmk. 9.20

Date when A/c rendered 14.1.1960.



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