

Rpt. 4b

Date of writing report 28.12.61 Received London Port Helsingfors 16 JAN 1962
 Survey held at Helsingfors No. of visits In shops No. 8382 M
 On vessel 59 First date 27.10.59 Last date 3.11.61

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 19598 Name "LENINGRAD" Gross tons 9425,2
 Owners U.S.S.R. Managers Port of Registry Murmansk
 Hull built at Helsingfors By Wärtsilä-koncernen Ab, Sandvikens Skeppsdocka Yard No. 366 Year Month 1961-11
 Main Engines made at Vasa By Wärtsilä-koncernen Ab, Wasa Mekaniska Verkstad Eng. No. 181-182-183-184 185-186-187-188 When 1959-60
 Bearing made at By
 Donkey boilers made at Helsingfors By Wärtsilä-koncernen Ab, Maskin och Bro Blr. Nos. 2860-2861 When 1959
 Machinery installed at Helsingfors By Wärtsilä-koncernen Ab, Sandvikens Skeppsdocka When 1961

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? yes Is ship intended to carry petroleum in bulk? no
 Is refrigerating machinery fitted? yes If so, is it for cargo purposes? no Type of refrigerant Freon
 Is the refrigerating machinery compartment isolated from the propelling machinery space? yes 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 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 8 No. of propellers 3 Brief description of propulsion system Diesel-electric
 MAIN RECIPROCATING ENGINES. Licence Name and Type No. Sulzer 9MH51/55, See my Reports Nos. 7122-7179-7238-7263-7311-7343-7651-7691

No. of cylinders per engine 9 Dia. of cylinders 510 stroke(s) 550 2 or 4 stroke cycle 2 Single or double acting single
 Maximum approved BHP per engine 3250 SHP 22000 at 330 RPM of engine and 115/145 RPM of propeller.
 Corresponding MIP 5,3 kg (For DA engines give MIP top & bottom) Maximum cylinder pressure 65 kg Machinery numeral 4400
 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? through ports No. and type of mechanically driven scavenge pumps or blowers per engine and how driven Each cylinder has a lever driven scavenge pump
 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 0,24-0,40 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 & FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel one Inlet none Exhaust none Starting one Safety one

Material of cylinder covers Cast steel Material of piston crowns Cast steel Is the engine equipped to operate on heavy fuel oil? no
 Cooling medium for: Cylinders Fresh water Pistons Lub. 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 m³ No. and total area of explosion relief devices 2250 cm²
 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? Seating How is the engine started? By air
 Can the engine be directly reversed? no If not, how is reversing obtained? By reversing the current in the propelling motors

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 23.4.57 State barred speed range(s), if imposed
 Is 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) 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 Centre 310 mm Breadth of webs at mid-throw 450 mm Axial thickness of webs 163 mm
 Side - Pins - Minimum -

Shrunk, radial thickness around eyeholes - Are dowel pins fitted? - Crankshaft material Journals Approved - Tensile strength -
 Diameter of flywheel 1330 mm Weight 432 kg Are balance weights fitted? yes Total weight 45,8+25,5 kg Radius of gyration 273 mm+490 mm
 Diameter of flywheel shaft 310 mm Material - Minimum approved tensile strength -

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

012705-012710-0093½

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
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 8 KW per generator 2150 at 330 RPM AC or DC? DC Position Each coupled directly to diesel engine.
No. of propulsion motors 4 SHP per motor 5500 at 115/145 RPM Position 2 side, 2 centre coupled direct to shaft.
How is power obtained for excitation of generators? Independent exciters Motors? Independent exciters.

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 Side 470mm Centre 580mm Material SM steel Minimum approved tensile strength 55 kg/mm²

Shaft separate or integral with crank or wheel shaft? separate Diameter of intermediate shaft Side 460mm Centre 560mm Material SM steel

Minimum approved tensile strength 55 kg/mm² Diameter of screwshaft cone at large end Side 490mm Centre 615mm 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
Side 24 mm Centre 27 mm Thickness between bearings Material of screw/tube shaft SM steel Minimum approved tensile strength 55 kg/mm²

Is an approved oil gland fitted? no If so, state type Length of bearing next to and supporting propeller 2175 mm side 2470 mm centre

Material of bearing Tufnol 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 Side 4820mm Side 3860mm Centre 5860mm Pitch 4060mm Built up or solid Built up. Total developed surface No. of blades 4 Blade thickness at top of root fillet Side 225mm Centre 273mm Blade material Cast steel Moment of inertia of dry propeller If propeller is of special design, state type Split hub 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 ordinary propeller

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 each 75 m³/h free air, driven by el. motors, situated one in each Main Diesel Room. Cert. no. 59/312 A&B.

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 6 main, 3 m³ each, in main diesel rooms, Cert. Nos. HNO.C.58/1045 and 59/272, 4 Aux. 100 liters in main diesel engine rooms, Nos. KLN.C.60/156 and Bremen 9361.

How are receivers first charged? By emergency hand compressor Maximum working pressure of starting air system 30 kg/cm² Are the safety devices

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 4 No. of main engine lubricating oil coolers 4

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure 2 Service tanks in boiler room.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) none

Service for which each pump is connected to be marked thus X																	10. 11. 1962	
INDEPENDENT PUMPS																	DELIVERY	
Name below essential pumps, state position and how driven. Give capacity of bilge pumps.																		
All by el. motors. pos. dies. eng. rooms except as noted																		
	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	Piston Cooling	Sea		
1 Bilge 15 t/h each	XX	XX	XX			XX										XX		
2 Bilge, 100 t/h each	XX	XX	XX			XX										XX		
3 Fire						XXX							XXX					
10 Cooling Water, SW for all Eng.		XX			XXX	XXX				XXX	XXX					XXX		
4 Cooling water, for Aux.		XX			XXX	XXX				XXX	XXX					XXX		
2 Lub. Oil Transfers					XX	XX				XX	XX					XX		
5 Lub. Oil for M.E.								XX										
4 Fuel Oil, Boosters for M.E.								XXXXX							XXXXXXXXXX			
2 Fuel Oil, Transfer					XX													
2 Fuel Oil, Trim					XX								XX					
4 " " Boosters for Aux. Eng.					XXXX								XX					
2 Boiler feed, in boiler room							XX			XX								
1 Injector, in boiler room							X			X								
2 Trim, 100t/h for peaks		XX				XX												
4 Heeling, from Heeling tank to "																		
4 F.V. Cooling																		
3 Cooling water pumps for Prop. Motors																		

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room From coff. dams, 2"

No. and size connected to main bilge line in main engine room 2 in each main diesel engine room 3" 2 in side propeller motor room 2 1/2" 2 in centre propeller motor room 3"

In aux. engine room none Size and position of direct bilge suction in machinery spaces 1 in each diesel engine room 7" 1 in centre " 3"

1 in each propeller motor room 2 1/2" Size and position of emergency bilge suction in machinery spaces 2 from each diesel eng. room size 8" (cooling water p.) 2 from each diesel- and propeller motor room, size 8" (trim p.)

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

special requirements for ships carrying dangerous goods or for ships engaged in navigation in ice? (strike out words not applicable). 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)
Fore engine room lower deck	K 58 E Seal	Wärtsilä-Wasa Mek. Verkt.	Hfs 7565 Rpt.	Generator 385 KVA Cos φ = 0,8
" " " "	" " " "	" " " "	" 7564 " "	" " " "
" " " "	" " " "	" " " "	" 7690 " "	" " " "
Aft engine room lower deck	K 55 E Seal	" " " "	" 7563 " "	" 213 KVA Cos φ = 0,8
" " " "	K 58 E Seal	" " " "	" 7674 " "	" 385 KVA Cos φ = 0,8
" " " "	" " " "	" " " "	" 7694 " "	" " " "
" " " "	" " " "	" " " "	" 7748 " "	" " " "
Boat deck, port	4SA3Cy. 140x180	Süddeutsche Bremsen A.G.	Cert. Aug. 2502/B74	62 1/2 KVA

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

4 generators each 385 KVA Is an electric generator driven by Main Engine? 8 Gen. by 8 main engines

STEAM INSTALLATION. No. of donkey boilers burning oil fuel 2 W.P. 10 kg/cm² Type Babcock & Wilcox Water tube type

Position Upper deck

Is a superheater fitted? no Are these boilers also heated by exhaust gas? no No. of donkey boilers heated by exhaust gas only?

Type Position 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?

Port and No. of report on donkey

Is steam essential for operation of the ship at sea? no Are any steam pipes over 3 ins. bore? yes If so, what is their

material? steel 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 No. of Evaporators one

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars.) Electric-hydraulic with two el.

motors, each driving oil pump of variable output type.

Have the Rule Requirements for fire extinguishing arrangements been complied with? yes Brief description of arrangements CO₂ installation and portable

foam extinguishers, and steam smothering in Boiler Room and in the silencers inside the funnel.

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-

ower sea trials of main engines 28-29.10.61. 12 hours Does this machinery installation contain any features of a novel or experimental nature? (Give particulars)

no

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).

012705-012710-00932

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 has been constructed and installed under Special Survey in accordance with the Rules, approved plans and Secretary's letters. The quality of the material and workmanship found good.

The Machinery is eligible in my opinion to be classed +LMC.

A. J. J. J.

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 See Main Engine reports.

CRANKSHAFT OR ~~INTERMEDIATE~~ SHAFTS See Main Engine reports.

FLYWHEEL SHAFTS integral with crankshafts

THRUSTSHAFTS 16236 SHF 5.6.58 H.H., 16237 SHF 4.7.58 H.H. and 21686 SHF 17.4.59 H.H.

GEARING

INTERMEDIATE SHAFTS SHF 16225 H.H., SHF 16224 H.H. 12.2.59, SHF 22185 E.P.26.5.59. SHF 16226 H.H., SHF 16227 H.H.

SCREW ~~AND~~ SHAFTS

SHF 12875 H.H., SHF 12876 H.H., SHF 12871 H.H.

3 Bosses:

PROPELLERS

OTHER IMPORTANT ITEMS Spare Shaft for Centre Propeller: 20327 SHF 12.8.59 H.H.

Spare Shaft for Wing Propellers: SHF 12866 H.H.

Is the installation a duplicate of a previous case? yes

If so, state name of vessel

"Moskva"

Date of approval of plans for crankshaft

Straight shafting 29.5.58

Gearing

Clutch

Separate oil fuel tanks

Pumping arrangements

Oil fuel arrangements 12.12.60

Cargo oil pumping arrangements

Air receivers

Donkey boilers 21.10.57

Dates of examination of principal parts:-

Fitting of stern tube 29.9.59

Fitting of propellers 2.10.59

Completion of sea connections 30.9.59

Alignment of crankshaft in main bearings 15.8.61

Engine chocks & bolts 15.5.61

Alignment of gearing

Alignment of straight shafting 22.6.61

Testing of pumping arrangements 31.10.61

Oil fuel lines 5.8.61

Donkey boiler supports 14.4.61

Steering machinery 4.10.61

Windlass 4.10.61

Date of Committee

FRIDAY 16 FEB 1962

Special Survey Fee

Decision

+ LMC ES

DBS

TS(61)

11.61

Expenses

Date when A/c rendered



Lloyd's Register Foundation