

5 JUN 1963

Rpt. 4b

Date of writing report Received London Port Copenhagen No. 20168
 Survey held at Copenhagen & Nakskov In shops 52 23.6.61 14.9.62
 No. of visits 42 First date 4.10.62 Last date 5.4.63
 On vessel

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 92679 Name m.s. "KOSMONAVT" Gross tons 10658
 Owners U.S.S.R. Managers - Port of Registry Odessa
 Hull built at Copenhagen By A/S Burmeister & Wain Yard No. 791 Year Month
 Main Engines made at Copenhagen By A/S Burmeister & Wain Eng. No. 7171 When 1962-7
 Gearing made at No gearing By Aalborg Værft A/S 2014 1962-1
 Donkey boilers made at Helsingør By Helsingør Skibsværft & Maskinbyggeri A/S Blr. Nos. 1269 When 1962-3
 Machinery installed at Copenhagen By A/S Burmeister & Wain When 1963-4

Particulars of restricted service of ship, if limited for classification None
 Particulars of vegetable or similar cargo oil notation, if required None
 Is ship to be classed for navigation in ice? Yes Class 3 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 C Cl2 F2
 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 Reversible heavy oil eng. Direct to propeller.
 MAIN RECIPROCATING ENGINES. Licence Name and Type No. B&W-DM.684VT2BF-180, Turbocharged, crosshead type, solid injection.

No. of cylinders per engine 6 Dia. of cylinders 840 mm stroke 1800 mm 2 or 4 stroke cycle 2 Single or double acting single
 Maximum approved BHP per engine 12600 at 110 RPM of engine and 110 RPM of propeller.
 Corresponding MIP 9.5 kg/cm² (For DA engines give MIP top & bottom) Maximum cylinder pressure 65 kg/cm² Machinery numeral 2520
 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? valve in 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 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 electrically driven No. of scavenge air coolers 2 Scavenge air pressure at full power 0.72 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 & FOUR STROKE ENGINES-GENERAL. No. of valves per cylinder: Fuel 3 Inlet ports in cylinder Exhaust 1 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
 Cooling medium for: Cylinders fresh water Pistons lub. oil Fuel valves fuel oil 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? type Total internal volume of crankcase 193 m³ No. and total area of explosion relief devices 14-9884 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 Yes How is the engine started? By 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? 7 Hours

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 11.8.61 State barred speed range(s), if imposed
 Not to be operated continuously between 35-45 RPM for working propeller. 35-45 RPM 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 8 Are main bearings of ball or roller type? No Distance between inner edges of bearings in way of crank 1122 mm Distance between centre lines of side cranks or eccentrics of opposed piston engines -

Crankshaft type: Built, semi-built, solid. (State which) All built
 Diameter of journals 680 mm Diameter of crankpins 260mm centre hole Breadth of webs at mid-throw 1440 mm Axial thickness of webs 350 mm
 If shrunk, radial thickness around eyeholes 375 mm Are dowel pins fitted? No Crankshaft material Journals SM steel Minimum 44 kg/mm²
 Webs SM steel Tensile strength -
 WD² of flywheel 12300 kgm² Weight - Are balance weights fitted? Yes Total WD² 39600 kgm² Radius of gyration -
 Diameter of flywheel shaft 680 mm Material SM steel Minimum approved tensile strength 44 kg/mm²
 Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with crankshaft

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MAN 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 ... 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 ... 550 mm ... Material ... SM steel ... Minimum approved tensile strength ... 44 kg/mm² ...
Shaft separate or integral with crank or wheel shaft? ... separate ... Diameter of intermediate shaft ... 476 mm ... Material ... SM steel ...
Minimum approved tensile strength ... 44 kg/mm² ... Diameter of screwshaft cone at large end ... 570 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 ... 26 mm ... Thickness between bearings ... 26 mm ... Material of screwshaft ... SM 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 ... 2400 mm ...
Material of bearing ... Lignum Vitae ... 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 ... 5900 mm ... Pitch ... 5977/4697 mm ... Built up or solid ... solid ... Total developed surface ... 14.24 m² ...
No. of blades ... 4 ... Blade thickness at top of root fillet ... 243 mm ... Blade material ... Nikalium ... Moment of inertia of dry propeller ... 96700 kgm² ...
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 ... Bronze ... Moment of inertia ... 109/00 kgm² ...

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 electrically driven each 240 m³/hr. Engine room portside. CPN. Cert. dated 6/9/62 ...
No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) ... Main:- 2-13m³. Engine room portside. CPN Cert. No. 1961 X2. Aux:- 1-300 litres. Eng. room stbd. CPN Cert. No. 1955 XA. By a hand starting oil engine ...
How are receivers first charged? ... Driven air compressor ... Maximum working pressure of starting air system ... 25 kg/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 ... 2 ... 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 ... None ...

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) ... 6 fuel pumps ...

(I) Electr. driven, (II) Steam driven. Service for which each pump is connected to be marked thus X
INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.
Engine Room port
(I) 2 fire pumps
(I) 1 ballast
(I) 1 bilge
(I) F.W. cooling f. aux. engs.
(I) F.W. cooling f. main eng.
(I) 2 S.W. cooling f. main eng.
(I) 2 lub. oil pumps
Engine Room stbd.
(I) S.W. cooling f. aux. engs.
(I) 1 ballast
(I) 2 fuel oil transfer
Aux. Boiler Room
(II) 2 feed pumps

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room ... Holds 1 & 2:- 2-3ins. Holds 3 & 4:- 2-3ins. Hold 5:- 4-2ins.
No. and size connected to main bilge line in main engine room ... P.S. 2-2ins. S.S. 2-2ins. Aft. 1-2ins. Main Engine sump. 2-2ins. In tunnel 2-2ins.
In aux. engine room ... Size and position of direct bilge suction in machinery spaces Port Side:- 2-3ins. Stbd. Side:- 2-4ins. Size and position of emergency bilge suction in machinery spaces Port Side:- 1-8ins.
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 classed for navigation in ice? (strike out words not applicable). ... Yes ...

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
Fwd. inboard	heavy oil	Burmeister & Wain A/S	Cpn. Rpt. No. 20168	355 KVA Generator
Fwd. outboard	"	"	" " " 20168	355 KVA "
Middle	"	"	" " " 20168	215 KVA "
Aft.	"	"	" " " 20168	215 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 at sea ... 1-355 KVA Generator ...
Is an electric generator driven by Main Engine? ... Yes ...
STEAM INSTALLATION. No. of donkey boilers burning oil fuel ... 1 ... w.p. 7 kg/cm² ... Type ... Vertical fusion welded water tube ...
Position ... In a separate boiler room at the fwd. end of engine room port side ...
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 ... La Mont ... Position ... Below base of funnel ... Can the exhaust heated boilers deliver steam directly to the range of donkey boilers? ... Yes ...
boilers ... Cpn. No. 20168 ... 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? ... Copper ...
For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? ... Yes ... No. of oil burning pressure units ... 1 ... No. of steam condensers ... 1 ... No. of Evaporators (Atlas Freshwater Generator) ... 1 ...
STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) ... 2-AC motors Nos. 221361-62 (John Hastie & Co. Steering Gear No. H.G. 8594/5) each 30 H.P. 380 volts, 45 amps, made by Hugh J. Scott & Co. 2- H.P. 12 Hele Shaw pumps Nos. K. 12934-35 ...
Have the Rule Requirements for fire extinguishing arrangements been complied with? ... Yes ... Brief description of arrangements ... 10 Hydrants, 1-2000 litres froth tank, CO₂ installation, 1-45 litres & 12 portable extinguishers.
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 ... 3/4, 4/4 & 5/4-63 38 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) ...
Burmester & Wain's Maskin- og Skibsbyggeri
0205212

Crown Stays: *Material*.....*Tensile strength*.....*Diameter* { at body of stay,.....
or
over threads.....

Diameter { at turned off part,
or
over threads. No. of threads per inch Are the stays drilled at the outer ends

No. of threads per inch..... Pitch of tubes.....

of rivet holes.....Outer row rivet pitch at ends.....Depth of flange if manhole flanged.....

Cross Tubes: No. *External diameters* { *Thickness of plates*

The foregoing is a correct description.

Dates of Survey while building	During progress of work in shops - -	Is the approved plan of boiler forwarded herewith (If not state date of approval.)
	During erection on board vessel - -	Total No. of visits

9/1-14/1-21/1-30/1-8/2-11/2-
 13/2-14/2-18/2-7/3-3/4-4/4-5/4-63

GENERAL REMARKS (State quality of workmanship, opinions as to class, &c.)..... The boiler has been fitted on board under special survey in accordance with the requirements of the Rules.

Survey Fee £	:	:	When applied for.....	19
Travelling Expenses (if any) £	:	:	When received.....	19

Engineer Surveyor to Lloyd's Register of Shipping.

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