

Rpt. 4b

Date of writing report

Received London

23 NOV 1964

Port

Copenhagen

Survey held at

Copenhagen

No. of visits

In shops 39

19.8.63

No. 21210

On vessel 39

First date

21.4.64

Last date

21.2.64

2.10.64

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 41965

Name M.S. "BIJSK"

Owners U.S.S.R.

Managers -

Gross tons 10684

Hull built at Nakskov

By Nakskov Skibsværft A/S

Port of Registry Odessa

Main Engines made at Copenhagen

By Burmeister & Wain A/S

Yard No. 172

Year Month 1964-10

Gearing made at No gearing

By Aalborg Værft A/S

Eng. No. 7211

When 1964-2

Donkey boilers made at Aalborg

By Helsingør, Skibsværft & Maskinbyggeri A/S

Blr. Nos. 2174

When 1963-12

Machinery installed at Helsingør

By Nakskov Skibsværft A/S

Blr. Nos. 1304

When 1964-2

Particulars of restricted service of ship, if limited for classification none

When 1964-10

Particulars of vegetable or similar cargo oil notation, if required none

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

Is ship intended to carry petroleum in bulk? No

Refrigerating machinery fitted? yes

If so, is it for cargo purposes? No

Type of refrigerant C Cl<sub>2</sub> F<sub>2</sub>

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

Is the refrigerated cargo installation intended to be classed? No

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 port 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

AIN RECIPROCATING ENGINES. Licence Name and Type No. B&W-DM-874VT2BF-160, Turbocharged, crosshead type, solid injection

No. of cylinders per engine 8 Dia. of cylinders 740 mm stroke(s) 1600 mm 2 or 4 stroke cycle 2 Single or double acting single

Maximum approved BHP per engine 12000 at 115 RPM of engine and 115 RPM of propeller.

Responding MIP 9.5 kg/cm<sup>2</sup> (For DA engines give MIP top & bottom) Maximum cylinder pressure 65 kg/cm<sup>2</sup> Machinery numeral 2400

Are the cylinders arranged in Vee or other special formation? No If so, number of crankshafts per engine -

DO 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 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

stand-by or emergency pump or blower is fitted, state how driven electrically No. of scavenge air coolers 2 Scavenge air pressure at full load 0.72 kg/cm<sup>2</sup> Are scavenge manifold explosion relief valves fitted? Yes

DO 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? -

FOUR STROKE ENGINES-GENERAL. No. of valves per cylinder: Fuel 2 ports in Inlet 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

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 side of pistons? Yes

Is the engine of crosshead or trunk piston type? head Total internal volume of crankcase 158 m<sup>3</sup> No. and total area of explosion relief

17-9010 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

of bearings, etc? - Is the engine secured directly to the tank top or to a built-up seating? 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? 6 1/2 hours.

FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 18.5.63 563 R.

For spare propeller - Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? No

Positioned? - Type - No. of main bearings 10 Are main bearings of ball or roller

No. Distance between inner edges of bearings in way of crank 1004 mm Distance between centre lines of side cranks or eccentrics of opposed piston engines -

Type: Built, semi-built, solid. (State which) All built

Journals 620 mm Diameter of crankpins Centre 620 mm Breadth of webs at mid-throw 1420 mm Axial thickness of webs 314 mm

mm centr. hole 220mm centr. hole Are dowel pins fitted? No Crankshaft material Journals SM steel Minimum 44 kg/mm<sup>2</sup>

Radial thickness around eyeholes 345 mm Pins SM steel Approved 44 kg/mm<sup>2</sup> Tensile strength

Weight of flywheel 1900 kgm<sup>2</sup> Are balance weights fitted? Yes Total weight 76600 kgm<sup>2</sup> Radius of gyration

Weight of flywheel shaft 570 mm Material SM steel Minimum approved tensile strength 44 kg/mm<sup>2</sup>

160 mm centr. hole Shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with thrustshaft.

**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 .....  
 minute at full power ..... Gas delivery pressure ..... Gas delivery temperature ..... Have the turbines and attached equipment been tested w  
 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 comp  
 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  
 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 thrust shaft 570 mm Material SM steel Minimum approved tensile strength 44 kg/ft  
 160 mm centr. hole  
 Shaft separate or integral with crank or wheel shaft? separate Diameter of intermediate shaft 454 mm Material SM steel  
 Minimum approved tensile strength 44 kg/mm<sup>2</sup> Diameter of screwshaft cone at large end 545 mm and at coupling 502 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  
 bearings 27 mm Thickness between bearings 27 mm Material of screw/tube shaft SM Steel Minimum approved tensile strength 4  
 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  
 liners readily visible in dry dock? .....

**PROPELLER.** Diameter of propeller 5800 mm Pitch varying Built up or solid solid Total developed surface 15.74  
 5406 mm at 1811 mm rad.  
 No. of blades 4 Blade thickness at top of root fillet 221 mm Blade material Nikalium Moment of inertia of dry propeller 105580  
 If propeller is of special design, state type ..... Is propeller of reversible pitch type? No If so, is it of approved design? .....

**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 350  
 Eng. room port side. Ips. Cert. Nos. 21536 - 37 1. diesel  
 No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Main: 2-12 m<sup>3</sup> Main eng. room port  
 Cpn. Cert. No. 2051/52; Aux:- 1-300 litres. Aux. Eng. room stbd side. Cpn. Cert. 2020  
 How are receivers first charged? By a handstarting oil engine driven air compressor Maximum working pressure of starting air system 25 kg/cm<sup>2</sup> Are the safety  
 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) 8 fuel pumps

Electro driven (II) Steam driven Service for which each pump is connected to be marked thus X

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	Boiler	After Peak	Oil Fuel	Fire Main	Sea	Sea	Sea	
Engine Room Port															
1 Fire						X			X						
1 ballast 150 ts/h	X	X	X			X					X				
Aux. F.W. Cooling					X									X	
Main F.W. Cooling					X						X				
Main S.W. & F.W. Cooling					X	X			X	X					
Main S.W. cooling					X				X						
2 lub. oil pumps															
Engine Room Stbd.									X				X	X	
Aux. S.W. Cooling						X				X					
1 fire						X			X						
1 ballast 150 ts/h	X	X	X			X					X				
2 oil fuel transfer				X	X						X			X	
1 bilge 40 ts/h	X	X									X				
Aux. Boiler room														X	
2 feed pumps									X	X					

LGE SUCTIONS. No. and size in each hold, deep tank or pump room Holds 1 & 5:- 2-3 ins, each Holds 2-3 & 4:- 2-3 1/2 ins. each  
 Pipe Ornel - 1-20  
 Main Engine sump:- 1 1/2 ins.  
 and size connected to main bilge line in main engine room Port:- 2-2 1/2 ins. Stbd:- 2 1/2 ins. In tunnel 2-2 1/2 ins.  
 aux. engine room - Size and position of direct bilge suction in machinery spaces Port:-  
 - 6 ins. Stbd:- 1 - 6 ins. Size and position of emergency bilge suction in machinery spaces Port:- 1 - 8 ins.  
 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 petroleum in bulk, cargo oil or classed for 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)
Aux. Engine Room				
forward Outer	heavy oil	Burmeister & Wain	Cpn. Rpt, No. 21210	500 kVA generator
forward inner	" "	" "	" " " 21210	500 kVA "
ft Deckhouse	" "	Bukh	" " " 21210	215 kVA "
			" Cert. dated 14.2.64	hydraulically driven emergency fire pump

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  
 1 - 500 KVA generator  
 Is an electric generator driven by Main Engine? No  
**INSTALLATION.** No. of donkey boilers burning oil fuel 1 w.p.7 kg/cm<sup>2</sup> Type Vertical fusion welded water tube  
 in a separate boiler room at the fwd. end of engine room port side  
 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/cm<sup>2</sup>  
 La Mont Position In the funnel  
 Can the exhaust heated boilers deliver steam directly to  
 steam range or do they operate only as economisers in conjunction with oil fired boilers? Yes  
 Cpn. No. 21210 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  
 copper For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes No. of oil burning pressure  
 No. of steam condensers 1 No. of evaporators Fresh water distillers 1

**STEERING GEAR.** (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) 2 AC motors Nos. 235999 & 236000  
 h 30 H.P. 380 volts 47 amps made by Hugh J. Scott & Co. Steering gear No. H.G. 9474/5)  
 Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements 11 hydrants, 1 - 2000 litres  
 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-  
 trials of main engines 23/9, 24/9 & 2/10-64 34 hours Does this machinery installation contain any features of a novel or experimental nature? (Give particulars)

ing description of the main engine and auxiliaries and the particulars are as approved for torsional vibration characteristics (Strike out words not applicable)  
 AKTIESELSKABET  
 NAKSØV SKIBSVERFT  
 Builder  
 0047 2/2

**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 material has been tested as required by the Rules and the workmanship is good.

The machinery is in our opinion eligible to be classed with the notations:-

LMC 10/64, TS(CL) 10/64, 2 Aux.B 100 lbs 10/64

The keyway of the screw shaft is as described in Chapter C, Paragraph 1002 of the Rules.

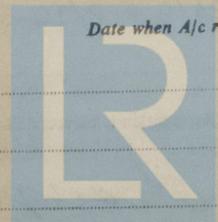
*H. Larsen*  
 Engineer Surveyor to Lloyd's Register of Shipping.

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

RODS (connecting) Lloyd's CPN 2311 (3), 2312 (2), 2313 (1), 2314 (1), GS 19.12.63  
 rods (piston) Lloyd's CPN 2337 (4), 2338 (3), 2339 (1), GS 6.1.64  
 CRANKSHAFT OR ROTOR SHAFT Lloyd's CPN 2197 - 2198 GS 3.10.63  
 FLYWHEEL SHAFT  
 THRUST SHAFT Lloyd's GOT 1724 GS 3.10.63  
 GEARING Crossheads Lloyd's CPN 2315 (3), 2316 (2), 2317 (3) GS 19.12.63  
 INTERMEDIATE SHAFTS Lloyd's Cpn. Nos. 2242, 2243, & 2257 KL 20.3.64, 24.3.64 & 8.5.64  
 SCREW AND TUBE SHAFTS Lloyd's Cpn. No. 2217 KL 8.5.64  
 PROPELLERS R.I.H. P 5770 Lloyd's 4.3.64 A.J. (working) & Lloyd's Ams. No. 1757 F.L. A.v.H.9.7.64  
 OTHER IMPORTANT ITEMS  
 cylinders: Lloyd's Test CPN 7 atm. GS 31.12.63  
 cyl. covers: Lloyd's Test CPN 10atm. GS 10.12.63 (4) JGL 11.12.63 (4)  
 pistons : Lloyd's Test CPN 5 atm. GS 26.11.63

Is the installation a duplicate of a previous case? No If so, state name of vessel -  
 Date of approval of plans for crankshaft 24.9.62 Straight shafting 19.3.63 Gearing - Clutch -  
 Separate oil fuel tanks - Pumping arrangements 23.5.63 Oil fuel arrangements 23.5.63  
 Cargo oil pumping arrangements - Air receivers 18.8.56 & 26.4.57 Donkey boilers 29.8.63, 28.10.63 & 9.1.64  
 Dates of examination of principal parts:-  
 Fitting of stern tube 30.4.64 Fitting of propeller 11.5.64 Completion of sea connections 13.5.64 Alignment of crankshaft in main bearings 4.6.64  
 Engine chocks & bolts 4.6.64 Alignment of gearing - Alignment of straight shafting 29.5.64 Testing of pumping arrangements 18.9.64  
 Oil fuel lines - Donkey boiler supports 4.9.64 Steering machinery 23.9.64 Windlass 23.9.64  
 Date of Committee FRIDAY 15 JAN 1965 Special Survey Fee 8130  
 Decision +LMC Construction Kr. 8780.-  
 Installation Kr. 4860.-  
 Expenses Kr. 2748.-

ES  
 ABS  
 SPS  
 TS (CL) } 10.64



Date when A/c rendered 9/11/1964  
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