

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.

Gross tons 10684

Hull built at Nakskov

Managers

By Nakskov Skibsværft A/S

Port of Registry Odessa

Main Engines made at Copenhagen

By Burmeister & Wain A/S

Yard No. 172

Year Month
When 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
1304When 1963-12
1964-2

Machinery installed at Nakskov

By Nakskov Skibsværft A/S

When 1964-10

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

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 answer 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-874VT2BF-160

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/cm²

(For DA engines give MIP top & bottom)

Maximum cylinder pressure 65 kg/cm²

Machinery numeral 2400

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 cover

No. and type of mechanically driven scavenge pumps or blowers per engine

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

0.72 kg/cm²

Are scavenge manifold explosion relief valves fitted? Yes

No. of scavenge air coolers 2

Scavenge air pressure at full

THREE STROKE ENGINES. Is the engine supercharged? No

Are the undersides of the pistons arranged as supercharge pumps? No

No. of exhaust gas driven blowers per engine

No. of supercharge air coolers per engine

Supercharge air pressure

Can engine operate without supercharger? No

& FOUR STROKE ENGINES—GENERAL.

No. of valves per cylinder: Fuel 2

ports in 2

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

Lubricating medium for:—Cylinders fresh water

Pistons lub. oil

Fuel valves fuel oil

Overall diameter of piston rod for double acting engines

Is the piston rod fitted with a sleeve? No

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 m³

No. and total area of explosion relief

17-9010 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

No. of bearings, etc? No

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? No

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.

Type of propeller

For spare propeller

Is a governor fitted? Yes

Is a torsional vibration damper or detuner fitted to the shafting? No

Position of propeller

Type

No. of main bearings 10

Are main bearings of ball or roller

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 220 mm

Centre 620 mm

Breadth of webs at mid-throw 1420 mm

Axial thickness of webs 314 mm

Radial thickness around eyeholes 345 mm

Are dowel pins fitted? No

Crankshaft material Journals SM steel

Pins SM steel

Minimum

Approved

Tensile strength

Weight of flywheel 1900 kgm²

Weight

Are balance weights fitted? Yes

Total weight 76600 kgm²

Radius of gyration

Diameter of flywheel shaft 570 mm

Material 160 mm centr. hole

SM steel

Minimum approved tensile strength

44 kg/mm²

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

011718-011724-0047 1/2

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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 _____

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

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/mm² 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

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? _____

State method of control _____ Material of spare propeller Electro Steel Moment of inertia 129000 kg Stg. 45

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 m³ 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/cm² 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

Name below essential pumps, state position and how driven. Give capacity of bilge pumps.																	
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	Lub. Oil	After Peak	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	Sea
Engine Room Port																	
1 Fire						X			X					X			
1 ballast 150 ts/h	X	X	X			X											
Aux. F.W. Cooling					X								X				X
Main F.W. Cooling					X							X					
Main S.W. & F.W. Cooling					X	X						X					
Main S.W. cooling						X					X	X					
2 lub. oil pumps						X					X						
Engine Room Stbd.								X									
Aux. S.W. Cooling						X									X	X	
1 fire						X					X						
1 ballast 150 ts/h	X	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																	
GE SUCTIONS. No. and size in each hold, deep tank or pump room. Holds 1 & 5 - 2 1/2 in																	

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

Port and size connected to main bilge line in main engine room Port:- 2-1/2 ins. Stbd:- 2-1/2 ins. Main Engine sump:- 1-1/2 ins.

aux. engine room - 6 ins. Stbd:- 1 - 6 ins. Size and position of direct bilge suction in machinery spaces Port:- 2-1/2 ins. In tunnel 2-1/2 ins.

the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? Yes Size and position of emergency bilge suction in machinery spaces Port:- 1 - 8 ins.

cial requirements for ships carrying petroleum in bulk, cargo oil or classed for navigation in ice? (strike out words not applicable). Yes Do the piping arrangements comply with the Rules including

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
ux. Engine Room				
orward Outer	heavy oil	Burmeister & Wain	Cpn. Rpt, No. 21210	500 kVA generator
orward inner	" "	"	" " " 21210	500 kVA "
ft	" "	"	" " " 21210	215 kVA "
ft Deckhouse	" "	Bukh	" Cert. dated 14.2.64	hydraulically driven emergency fire pump

electric current used for essential services at sea? Yes

1 - 500 KVA generator

AM INSTALLATION. No. of donkey boilers burning oil fuel 1 w.p.7 kg/cm² 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/cm²

La Mont Position In the funnel Can the exhaust heated boilers deliver steam directly to

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

1 copper 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

No. of steam condensers 1 No. of evaporators Fresh water distillers 1

ING 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) Nos. K. 13758-59

Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements 11 hydrants, 1 - 2000 litres

th tank, CO2 installations, 1 - 45 litres & 12 - portable extinguishers

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

Builder

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 ~~ON ROTOR SHAFT~~ Lloyd's CPN 2197 - 2198 GS 3.10.63

FLYWHEEL SHAFT

THRUSTSHAFT 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 checks & 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

Decision

+LMC

ES
ABS
SPS
TS(CL) } 10.64

Special Survey Fee

8130

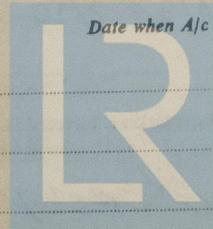
Construction Kr. 8780.-

Installation Kr. 4860.-

Expenses

Kr. 2748.-

Date when A/c rendered



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