

Rpt. 4b

Date of writing report 26-1-60.

Received London

Port Stockholm

No. 12386

Survey held at Gävle

No. of visits In shops 6 On vessel 15

First date 16.1.59. 12.5.59.

Last date 21.9.59. 28.11.59.

28 JAN 1960

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 40860 Name Twin Screw Motorship "ARBAN" Gross tons 1500
Owners U.S.S.R. Managers - Port of Registry Leningrad
Hull built at Gävle By A/B Gävle Varv Year Month
Main Engines made at Hamburg By Maschinenfabrik Augsburg-Nürnberg When 1959 11
Gearing made at By Eng. Nos. 405260&405261 When 1959 3
Donkey boilers made at Sävsjö, Sweden By A/B Vatten och Ånga Bir. Nos. 25308 When 1959
Machinery installed at Gävle By A/B Gävle Varv When 1959 11

Particulars of restricted services of ship, if limited for classification

Particulars of vegetable or similar cargo on 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? Domestic only If so, is it for cargo purposes? No
Is the refrigerating machinery compartment isolated from the propelling machinery space? 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.

No. of main engines 2 No. of propellers 2 Brief description of propulsion system 2 engines - 2 screw shafts - 2 alternating pitch propeller units.

MAIN RECIPROCATING ENGINES. Licence Name and Type No. MAN type GIOY 40/60 (with supercharging)

No. of cylinders per engine Dia. of cylinders stroke(s) 2 or 4 stroke cycle Single or double acting

Maximum approved BHP per engine RPM of engine and RPM of propeller.

Corresponding MIP (For DA engines give MIP top & bottom) Maximum cylinder pressure Machinery numeral

Are the cylinders arranged in Vee or other special formation? If so, number of crankshafts per engine

TWO STROKE ENGINES. Is the engine of opposed piston type? If so, how are upper pistons connected to crankshaft?

Is the exhaust discharged through ports in the cylinders or through valves in the cylinder covers? No. and type of mechanically driven scavenge pumps or blowers per engine and how driven

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 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 Inlet Exhaust Starting Safety

Material of cylinder covers Material of piston crowns Is the engine equipped to operate on heavy fuel oil?

Cooling medium for: -Cylinders Pistons Fuel valves Overall diameter of piston rod for double acting engines

Is the rod fitted with a sleeve? Is welded construction employed for: Bedplate? Frames? Entablature? Is the crankcase separated from the underside of pistons?

Is the engine of crosshead or trunk piston type? Total internal volume of crankcase No. and total area of explosion relief devices

Are flame guards or traps fitted to relief devices? Is the crankcase readily accessible? 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? Tank top How is the engine started? Compressed air

Can the engine be directly reversed? If not, how is reversing obtained?

Has the engine been tested working in the shop? How long at full power?

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system State barred speed range(s), if imposed for working propeller

For spare propeller Is a governor fitted? Is a torsional vibration damper or detuner fitted to the shafting?

Where positioned? Type No. of main bearings Are main bearings of ball or roller type? Distance between inner edges of bearings in way of crank(s) Distance between centre lines of side cranks or eccentrics of opposed piston engines

Crankshaft type: Built, semi-built, solid. (State which) Diameter of journals Diameter of crankpins Centre Side Breadth of webs at mid-throw Axial thickness of webs

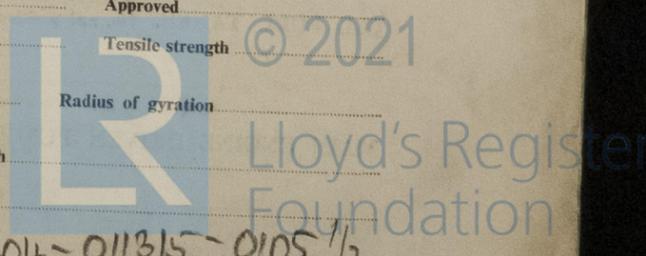
If shrunk, radial thickness around eyeholes Are dowel pins fitted? Crankshaft material Journals Pins Minimum Approved Tensile strength

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)

HAM at Got. rpt. No. 7502



011304-011315-0105 1/2

**MAIN GAS TURBINES** Name and Type No.

No. of sets of turbines: 1 Open or closed cycle: Open BHP per set: 1000 at 1000 RPM of output shaft: 1000  
 How is drive transmitted to propeller shaft? Direct  
 ARRANGEMENT OF TURBINES: HP drives: 1 RPM: 1000 IP gas inlet temperature: 1000 pressure: 1000  
 (A small diagram should be attached showing gas cycle.)  
 IP drives: 1 RPM: 1000 IP gas inlet temperature: 1000 pressure: 1000  
 LP drives: 1 RPM: 1000 LP gas inlet temperature: 1000 pressure: 1000  
 No. of air compressors per set: 1 Centrifugal or axial flow type? Centrifugal Material of turbine blades: Aluminum Material of compressor blades: Aluminum  
 No. of air coolers per set: 1 No. of heat exchangers per set: 1 How are turbines started? Electric  
 How is reversing effected? By electric motor Are the turbines operated in conjunction with free piston gas generators? No  
 Total No. of free piston gas generators: 0 Diameter of working pistons: 1000 Diameter of compressor pistons: 1000 No. of double strokes per minute at full power: 1000 Gas delivery pressure: 1000 Gas delivery temperature: 1000 Have the turbines and attached equipment been tested working in the shop? Yes How long at full power? 1000

**ELECTRIC PROPULSION** (Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 44.)  
 No. of generators: 1 KW per generator: 1000 at 1000 RPM AC or DC? AC Position: Starboard  
 No. of propulsion motors: 1 SHP per motor: 1000 at 1000 RPM Position: Starboard  
 How is power obtained for excitation of generators? From main engine Motors? None

**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? Double helical Is single, position of gear thrust bearing: Starboard Is gearing of epicyclic type? No  
 PCD of pinions: First reduction: 1000 Second reduction: 1000 PCD of wheels: First reduction: 1000 Main: 1000  
 Material of pinions: Steel Tensile strength: 1000 Material of wheel rims: Steel Tensile strength: 1000  
 Are gear teeth surface hardened? Yes How are teeth finished? Grinding Diameter of pinion journals: 1000 Wheel shaft journals: 1000  
 Are the wheels of welded construction? Yes Is gear case of welded construction? Yes Has the wheel/gear case been heat treated on completion of welding? Yes Where is the propeller thrust bearing located? Starboard Are gear bearings of ball or roller type? Ball

**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 decoupled? Yes If so, what? None

**STRAIGHT SHAFTING.** Diameter of thrust shaft: 280 mm Material: S.M.-steel Minimum approved tensile strength: 50 kg/mm<sup>2</sup>  
 Shaft separate or integral with crank or wheel shaft? Separate Diameter of intermediate shaft: 210 mm Material: S.M.-steel  
 Minimum approved tensile strength: 44 kg/mm<sup>2</sup> Diameter of screw shaft: 240 mm with 80 mm central hole Is screw shaft fitted with a continuous liner? No  
 Diameter of tube shaft: 240 mm Is tube shaft fitted with a continuous liner in way of stem tube? No Thickness of screw/tube shaft liner: 10 mm  
 Bearings: Thickness between bearings: 10 mm Material of screw/tube shaft: S.M.-steel Minimum approved tensile strength: 44 kg/mm<sup>2</sup>  
 Is an approved oil gland fitted? Yes If so, state type: Cadervall Length of bearing next to and supporting propeller: 1000 mm  
 Material of bearing: White metal In multiple screw vessels is the liner between stern tube and A bracket continuous? Yes If not, is the exposed length of shafting between liners readily visible in dry dock? Yes

**PROPELLER.** Diameter of propeller: 2500 mm Pitch: Variable Built up or solid: Solid Total developed surface: 1000  
 No. of blades: 3 Blade thickness at top of root fillet: 10 mm Blade material: Stainless steel Moment of inertia of dry propeller: 2720 kgm<sup>2</sup>  
 If propeller is of special design, state type: KaMeWa Is propeller of reversible pitch type? Yes If so, is it of approved design? Yes  
 State method of control: Hydraulic Material of spare propeller: blades steel Moment of inertia: 1000

**AIR COMPRESSORS & RECEIVERS.** No. of main engine driven compressors per engine: None Can they be decoupled? No  
 No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) 2 off 56 m<sup>3</sup>/h; electric motors; port & starb. fwd. in main E.R. Kiel cert. Nos. 58/6729 & 58/2700. 1 off Emergency air compressor, 11.4 m<sup>3</sup>/h; diesel motor; starb. side fwd. Copenhagen cert. dated 3rd March, 1959.  
 No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 3 off main; 1000 litres each; port, centre & starb. side fwd. in main E.R.; Hamburg cert. No. 58/6732 - 1 off aux.; - 55 litres in main E.R.; port side aft Augsburg cert. No. 59/455 - 1 off aux.; 125 hrs in aux. eng. room; Aug. cert. No. 59/446.  
 How are receivers first charged? By one diesel driven emergency compressor. Maximum working pressure of starting air system: 30 kg/cm<sup>2</sup> 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: 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) See Hamburg report No. 7502.

| INDEPENDENT PUMPS<br>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 |              |              |          |                     |     |            |          |                        |             |                    |                     |                |           |          |                |                        |
|---|--|--------------|--------------|----------|---------------------|-----|------------|----------|------------------------|-------------|--------------------|---------------------|----------------|-----------|----------|----------------|------------------------|
|   | SUCTION  |              |              |          |                     |     |            | DELIVERY |                        |             |                    |                     |                |           |          |                |                        |
|   | Bilge Main   | Bilge Direct | Ballast Main | Oil Fuel | Fresh Water Cooling | Sea | Feed Tanks | Lub. Oil | Alt. pitch prop. units | Boiler Feed | Salt Water Cooling | Fresh Water Cooling | Oil Fuel Tanks | Fire Main | Lub. Oil | Piston Cooling | Alt. pitch prop. units |
| Electr. driven bilge pump, s.s., 80 m <sup>3</sup> /h   | X  | X            | X            |          |                     | X   |            |          |                        |             |                    |                     |                |           |          |                | Sea                    |
| Electric driven ballast pump, s.s., 100 m <sup>3</sup> /h   | X  | X            | X            | X        |                     | X   |            |          |                        |             |                    |                     |                |           |          |                | X                      |
| Electric driven fire pump, s.s.   |  |              |              |          |                     | X   |            |          |                        |             |                    |                     |                |           |          |                | X                      |
| Diesel driven emerg. fire pump, steer. gear compartm.   |  |              |              |          |                     | X   |            |          |                        |             |                    |                     |                | X         |          |                | X                      |
| Electric driven O.F. transfer pump, p.s.  |  |              |              | X        |                     |     |            |          |                        |             |                    |                     |                | X         |          |                | X                      |
| Electric driven 2 lub. oil stand by pumps, p.s.   |  |              |              |          |                     |     |            | X        |                        |             |                    |                     |                |           |          |                | X                      |
| El. driven 3 main cool. w. pumps (s.w. & fr. w.) port, centre & starb. fwd.                                   |  |              |              |          | X                   | X   |            |          |                        |             | X                  | X                   |                |           |          |                | X                      |
| El. driven 2 stand by cool. w. pumps (s.w. & fr. w.) for aux. engs. in ME room, p.s. aft.                     |  |              |              |          | X                   | X   |            |          |                        |             | X                  | X                   |                |           |          |                | X                      |
| El. driven 1 stand by cool. w. pump for aux. engs. in aux. E.R.   |  |              |              |          |                     | X   |            |          |                        |             | X                  | X                   |                |           |          |                | X                      |
| El. driven 2 stand by lub. oil pumps for altern. pitch prop. units, p & s.                                    |  |              |              |          |                     |     |            |          | X                      |             |                    |                     |                |           |          |                | X                      |
| Steam driven Donkey Boiler feed pump, s.s.  |  |              |              |          |                     |     | X          |          |                        | X           |                    |                     |                |           |          |                | X                      |
| El. driven D.B. feed pump, s.s.   |  |              |              |          |                     |     | X          |          |                        | X           |                    |                     |                |           |          |                | X                      |

**BILGE SUCTIONS.** No. and size in each hold, deep tank or pump room No. 1 hold: 2 off 2" - Provision store: 1 off 2 1/2" + 1 off 2"  
 Compressor room: 2 off 3" - Salv. pump room: 2 off 2" - No. 2 hold: 2 off 2 1/2"  
 No. and size connected to main bilge line in main engine room: 3 off 3" + 2 off 2" Coff. dams: 1 off 3" in each. In tunnel: 2 off 2" + 1 off 2 1/2"  
 In aux. engine room: 2 off 3" Size and position of direct bilge suction in machinery spaces: 4" at fwd end, - 1 off 5" at aft end. - 1 off 4" in aux. E.R. Size and position of emergency bilge suction in machinery spaces: See direct suction above.  
 Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? No 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) |
| Port side aft in ME-room       | 4 SCSEA Diesel | MAN-AG  | Augsburg cert. No. 59/671     | One 100 KVA-3 phase alternator                           |
| Starb. side aft in ME-room     | 4 SCSEA Diesel | MAN-AG  | Augsburg cert. No. 59/672     | One 100 KVA-3 phase alternator                           |
| Port side, in aux. eng. room   | 4 SCSEA Diesel | MAN-AG  | Augsburg F.E. rpt. No. 1241   | One 200 KVA-3 phase alternator                           |
| Centre, in aux. eng. room      | 4 SCSEA Diesel | MAN-AG  | Augsburg F.E. rpt. No. 1241   | One 200 KVA-3 phase alternator                           |
| Starb. side, in aux. eng. room | 4 SCSEA Diesel | MAN-AG  | Augsburg F.E. rpt. No. 1241   | One 200 KVA-3 phase alternator                           |

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: One generator, 200 KVA  
 Is an electric generator driven by Main Engine? No  
**STEAM INSTALLATION.** No. of donkey boilers burning oil fuel: 1 W.P. 85 lbs/sq. ins. Type: Single ended multitubular "Univex"  
 Position: In a separate compartment on starb. side in aux. eng. room.  
 Is a superheater fitted? No Are these boilers also heated by exhaust gas? No No. of donkey boilers heated by exhaust gas only? None W.P. 85 lbs/sq. ins.  
 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? No Port and No. of report on donkey boilers: Gothenburg No. 24772  
 Is steam essential for operation of the ship at sea? No Are any steam pipes over 3 ins. bore? No 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: None No. of Evaporators: 1

**STEERING GEAR.** (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) Maker: - A/S Svendborg Skibsvaerft; Type 140/13 LCR4; 1 hydr. pump electr. driven with double pipes to steering gear; 1 hand operated hydr. pump in the steering pedestal on bridge.  
 Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements: To Lloyd's Rules and U.S.S.R. requirements  
 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: 13.11.59. - 6 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).

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 of this vessel has been installed under Special Survey in accordance with the Rules, approved plans and Secretary's letters, and tested under working conditions on trial trip and found satisfactory. The workmanship and materials are good.

The machinery of this vessel is eligible, in my opinion, to be classed in the Register Book with the record of +LMC 11.59 and OG, and with the notation "Strengthened for Navigation in ice," the engines not to be operated continuously between 80 and 100 r.p.m.

*J. Leisner*

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 Hamburg report No. 7502.

CRANKSHAFT OR ROTOR SHAFT Hamburg report No. 7502.

FLYWHEEL SHAFT { Port:- LLOYDS DTM J.L. 782 2.9.57. HAM. 10.1.58. H. Ka.

THRUST SHAFT { Starb:- LLOYDS DTM HK 858 A 4.11.57. HAM. 10.1.58. H. Ka.

LLOYDS SKM NO. 862 KE 20.5.59 DTM J.L. 4.9.57.

GEARING { Port:- LLOYDS GOT. NO. 904 GU. 26.3.59.

LLOYDS SKM NO. 863 KE 20.5.59. DTM J.L. 14.9.57.

INTERMEDIATE SHAFTS { Starb:- LLOYDS GOT. NO. 903 GU. 26.3.59.

Port:- LLOYDS GOT. NO. 867 GU. 26.3.59.

SCREW AND TUBE SHAFTS Starb:- LLOYDS GOT. NO. 836 GU. 26.3.59.

PROPELLERS Please see Got. cert. No. 2674 attached hereto.

OTHER IMPORTANT ITEMS OK-couplings between screw shafts and intermediate shafts:-

Port side:- LLOYDS SKM NO. 8748 S.W. 23.9.57.

Starb. side:- LLOYDS SKM NO. 8749 S.W. 23.9.57.

Is the installation a duplicate of a previous case? Yes If so, state name of vessel "PAMIR", "ALDAN" and "AGATAN".

Date of approval of plans for crankshaft Hamb. rpt. 7502 Straight shafting 18.4.1957. Gearing Chirch

Separate oil fuel tanks 20.1.58 & 1.3.58. Pumping arrangements 19.10.57. Oil fuel arrangements 19.10.57.

Cargo oil pumping arrangements XXXXXXXXXX Air receivers HAM. cert. No. 58/1732  
AUG. cert. No. 59/455  
AUG. cert. No. 59/446 Donkey boilers See Got. rpt. No. 24

Dates of examination of principal parts:-  
Fitting of stern tube 28.4-8.5.59. Fitting of propeller 9.5.-12.5.59. Completion of sea connections 12.5.59. Alignment of crankshaft in main bearings 11.6.59.

Engine checks & bolts 5.6.59. Alignment of gearing Alignment of straight shafting 11.6.59. Testing of pumping arrangements 17.11.

Oil fuel lines 17.11.59. Donkey boiler supports 23.6.59. Steering machinery and Windlass working 13.11.59.

Date of Committee FRIDAY 11 MAR 1960 Special Survey Fee £ 2.530

Decision See Rpt. 1. Expenses £ 212.

