

Rpt. 4b

Date of writing report 30 Nov. 59

Survey held at Pansio,

Received London 14
In shops 12
On vessel 12

Port Abo No. 212
13 April, 59 6 Oct. 59
22 May, 59 Last date 24 Nov. 59

30 DEC 1959

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. _____ Name **M.V. "HALMAHERA"** Gross tons **2998.9**
 Owners **Ministry of Shipping Indonesia** Managers _____ Port of Registry **Djakarta**
 Hull built at **ÅBO, Finland** By **Valmet Oy Pansio Shipyard** Yard No. **242** Year Month **11-1959**
 Main Engines made at **Hamburg** By **Mascinenfabrik Augsburg-Nürnberg** Eng. No. **405 244** When **10-1958**
 Gearing made at _____ By _____
 Donkey boilers made at _____ By _____ Blr. Nos. _____ When _____
 Machinery installed at **Turku, Finland** By **Valmet Oy, Pansio shipyard, Turku, Finland** When **11.- 19.59**
 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? **No** 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 12**
 Is the refrigerating machinery compartment isolated from the propelling machinery space? **No** Is the refrigerated cargo installation intended to be classed? **None**

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 **one** No. of propellers **one** Brief description of propulsion system **one direct coupled heavy oil engine**

MAIN RECIPROCATING ENGINES. Licence Name and Type No. _____

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

Maximum approved BHP per engine _____ at **275** RPM of engine and **275** 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 valve(s) 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? _____

If a stand-by or emergency pump or blower is 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? _____

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 **not below 75 RPM** 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 _____ Breadth of webs at mid-throw _____ Axial thickness of webs _____

If shrunk, radial thickness around eyeholes _____ Are dowel pins fitted? _____ Crankshaft material _____ Journals _____ Approved _____

Webbs _____ Tensile strength _____

Diameter of flywheel _____ Weight _____ Are balance weights fitted? _____ Total weight _____ Radius of gyration _____

Diameter of flywheel shaft _____ Material _____ Minimum approved tensile strength _____

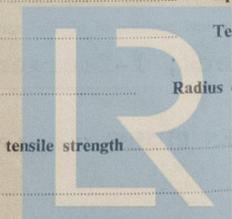
Flywheel shaft: **separate, integral with crankshaft, integral with thrustshaft.** (State which) _____

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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 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 240 mm. Material S.M. steel Minimum approved tensile strength 44 kg/cm²
 Shaft separate or integral with crank or wheel shaft? separate Diameter of intermediate shaft 185 mm. Material S.M. steel (welded in 3 sections)
 Minimum approved tensile strength 44 kg/cm² Diameter of screwshaft cone at large end 220 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 15 mm Thickness between bearings 12 mm Material of screwshaft S.M. steel Minimum approved tensile strength 44 kg/cm²
 Is an approved oil gland fitted? No If so, state type Length of bearing next to and supporting propeller 995 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 2600 mm. Pitch 1550 mm. Built up or solid solid Total developed surface 3-3.08 m²
 No. of blades 3 Blade thickness at top of root fillet 92 mm. Blade material bronze Moment of inertia of dry propeller 2300 kgm²
 If propeller is of special design, state type J. Stone & Co. Is propeller of reversible pitch type? No If so, is it of approved design? -
 State method of control Material of spare propeller C.I. Moment of inertia 2984 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) 2-30 kg/cm², 51 m³/H oil engine, (P.S. inbd. & outbd.), 1-hand compressor (S.S.), 1.8 m³/H. Kiel No. 59/5174 HMBG. Cert.No.59/323
 No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 2-main 1000 L. each E.R.(P.S.A.) upper & lower
 Hamburg 58/3541. 1-aux. 150 L. E.R.(P.S.). Düsseldorf No. 58/424 1-125 L. aux. 59/1158
 How are receivers first charged? hand compressor Maximum working pressure of starting air system 30 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 1 No. of main engine lubricating oil coolers 1
 1-1 m³ O.F. Service tank (aux). E.R. below main deck, P.S. 2-O.F. service tanks, 3.2 m³ each, E.R. port
 OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure 1-Emergency generator F.O. tank 350 L.(Emerg.gen.compt.boat deck(P.S.) starbd., main deck;
 MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 1 - O.F. feed pump & 1 - L.O. pump

INDEPENDENT PUMPS 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	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling
1 Fresh C.W. pump (starbd) Elect.					X						X				
1 Fresh C.W. pump (port) Elect.					X	X				X	X		X		
1 Sea C.W. pump (centre) Elect.					X	X				X	X		X		
1 Harb. fresh C.W. pump (S.S.F.) 90 m ³ /H. Elect.					X						X				
1 Harb. sea C.W. pump (S.S.F.) 60 m ³ /H. Elect.	X		X			X				X				X	
1 Bilge pump (S.S. centre) 60 m ³ /H. Elect.	X	X	X			X								X	
1 Ballast pump (S.S. aft) Elect.	X		X			X								X	
1 Stand by L.O. pump (S.S. aft) Elect.								X							X
1 Stand by F.O. feed pump (P.S.) Elect.				X											
1 F.O. trans. pump (S.S.F.) Elect.				X								X			
1 S.O.S. fire & bilge pump (tunnel) Elect.	X	X				X							X		
1 S.W. pump (sprinkler) (port) Elect.						X								X	

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room No 1 hold 2-65 mm., No 2 hold 2-80 mm., Cofferdam 1-50 mm., No 3 hold 2-65 mm.

No. and size connected to main bilge line in main engine room 4-100 mm In tunnel 2-80 mm

In aux. engine room --- Size and position of direct bilge suction in machinery spaces 1 - 100 mm (S.S.), 1-100 mm in tunnel Size and position of emergency bilge suction in machinery spaces 1 - 125 mm (P.S.)

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 ~~.....~~ 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)
E.R. floor (P.S. outbd.)	Oil Engine	M.A.N. AG. Augsburg	Augsburg No 1259	Elect. Gen. 120 KW & Air Comp. 30 kg/cm ²
E.R. floor (P.S. inbd.)	"	"	"	Elect. Gen. 120 KW & Air Comp. 30 kg/cm ²
E.R. floor (S.S.)	"	"	"	Elect. Gen. 120 KW
Boat deck (P.S.)	"	M.A.N.	" Cert. No 59/952	Elect. Gen. 24 KW

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 - 120 KW Is an electric generator driven by Main Engine? No

STEAM INSTALLATION. No. of donkey boilers burning oil fuel W.P. Type
 Position
 Is a superheater fitted? Are these boilers also heated by exhaust gas? No. of donkey boilers heated by exhaust gas only? W.P.
 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 boilers
 Is steam essential for operation of the ship at sea? Are any steam pipes over 3 ins. bore? If so, what is their material? For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? No. of oil burning pressure units No. of steam condensers No. of Evaporators

STEERING GEAR. (State No. and Type of ~~.....~~ Electric Motors, Hydraulic Pumps and other particulars) 1-elect. motor & 1 hyd. pump; elect. & hand hydraulic, (LR test ROT.130 kg, No 144, H.T.S. 17/7/59)

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements. Portable foam. extinguishers, water hoses C.O.2 smothering gas system in E.R. & holds, sprinkler system in accommodation spaces.

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 11/10/59 - 1 hr. 18/10/59 - 6 hrs. 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 described has been installed in the ship and tested under working conditions, in accordance with the approved plans and the requirements of the Rules to our satisfaction.

The machinery is eligible in our opinion to be classed +L.M.C. 11.59. T.S. - C.L., subject to a direct bilge suction to be fitted engine room (P.S.) by 5.60 (6 mos. limit) The main engine is not to be operated continuously below 75 R.P.M. (letter 1 Dec. 58), a notice board to this effect has been fitted at the control station and the tachometer marked accordingly.

NOTE: For entry in the Appendix to the Special Reasons List:- "Screwshaft liner has two circumferential welds."

J. G. Elliott & R. H. Jones

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

CRANKSHAFT OR ROTORSHAFT

FLYWHEEL SHAFT

THRUSTSHAFT

DTM: 414 H.A.K. 3/11/1956

~~XXXXXXXX~~

INTERMEDIATE SHAFTS

Åbo Nos. 778-779-780-793-794-795

SCREW ~~XXXXXXXX~~ SHAFTS

Åbo No. 777 ÅL 2.3.59. D.S.E. 15.1.59. Spare:- Åbo No 796 ÅL 1.4.59

PROPELLERS

LR Lon. WAR 29.4.59 Z3078 R.H.

OTHER IMPORTANT ITEMS

Is the installation a duplicate of a previous case? No If so, state name of vessel
 Date of approval of plans for crankshaft Straight shafting 14.5.59 Gearing Clutch
 Separate oil fuel tanks 19/3/59 Pumping arrangements C.W.-24/7/59, 20/11/59 Oil fuel arrangements 16/2/59, LO. 16/2/59
 Air receivers ~~XXXXXXXX~~

Dates of examination of principal parts:-

Fitting of stern tube 13/6/59 Fitting of propeller 15/6/59 Completion of sea connections 17/6/59 Alignment of crankshaft in main bearings
 Engine chocks & bolts 6/8/59 Alignment of straight shafting 14/8/59 Testing of pumping arrangements 11/11/59
 Oil fuel lines 13/10/59 Steering machinery 11/11/59 Windlass 11/11/59

Date of Committee FRIDAY 19 FEB 1960
 Decision See Rpt. 1.

Special Survey Fee Installation 86,750:-

Expenses 12,500

Date when A/c rendered



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