

13 MAY 1957

Rpt. 4b

Date of writing report 8-4-57

Received London

Port Groningen

No. 15056

Survey held at Appingedam

No. of visits In shops 3 On vessel 9

First date 14-12-56

Last date 26-1-57

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 92521 Name ms "RANA" Gross tons 499.47  
 Owners N.V. ms. Irene Managers Wynne & Barons Groningen Port of Registry Groningen Year Month  
 Hull built at Appingedam By Schm. Appingedam Yard No. 178 When 1957-4  
 Main Engines made at Appingedam By M.W. App. Pommersfeld Eng. No. 10262 When 1957  
 Gearing made at - By -  
 Donkey boilers made at - By - Blr. Nos. - When -  
 Machinery installed at Appingedam By Schm. Appingedam When 1957

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  
 Refrigerating machinery fitted? no If so, is it for cargo purposes? - Type of refrigerant -  
 Is the refrigerating machinery compartment isolated from the propelling machinery space? - Is the refrigerated cargo installation intended to be classed? -

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 direct  
**MAIN RECIPROCATING ENGINES.** Licence Name and Type No. Brons - 6ED - oil engine  
 No. of cylinders per engine 6 Dia. of cylinders 290 stroke(s) 450 2 or 4 stroke cycle 4 Single or double acting single  
 Maximum approved BHP per engine 395 at 350 RPM of engine and 350 RPM of propeller.  
 Corresponding MIP 6.85 (For DA engines give MIP top & bottom) Maximum cylinder pressure 45 Machinery numeral 79  
 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? - If so, how are upper pistons connected to crankshaft? -  
 Are 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? no 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? -

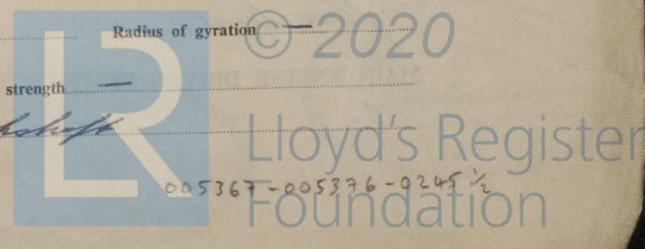
**TWO & FOUR STROKE ENGINES—GENERAL.** No. of valves per cylinder: Fuel 1 Inlet 1 Exhaust 1 Starting 1 Safety 1  
 Material of cylinder covers cast iron Material of piston crowns cast iron Is the engine equipped to operate on heavy fuel oil? no  
 Cooling medium for:—Cylinders freshwater Pistons none Fuel valves none Overall diameter of piston rod for double acting engines -  
 Is the rod fitted with a sleeve? no Is welded construction employed for: Bedplate? no Frames? no Entablature? no Is the crankcase separated from the underside of pistons? no  
 Is the engine of crosshead or trunk piston type? trunk Total internal volume of crankcase 3225 ltr No. and total area of explosion relief devices 3 @ 90 open  
 Are flame guards or traps fitted to relief devices? yes 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 or to a built-up seating? built up seating How is the engine started? by 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? 30 hrs.

**CRANK & FLYWHEEL SHAFTING.** Date of approval of torsional vibration characteristics of the propelling machinery system 9-10-56 State barred speed range(s), if imposed -  
 Working propeller none 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 7 Are main bearings of ball or roller type? no  
 Distance between inner edges of bearings in way of crank(s) 419 Distance between centre lines of side cranks or eccentrics of opposed piston engines -

Crankshaft type: Built, semi-built, solid. (State which) solid  
 Diameter of journals 187 Diameter of crankpins 187 Centre 187 Breadth of webs at mid-throw 250 Axial thickness of webs 105  
 Side 187 Pins - Minimum -  
 If shrunk, radial thickness around eyeholes - Are dowel pins fitted? - Crankshaft material sm steel Journals sm steel Approved 44 Appingedam  
 Webs - Tensile strength -

Diameter of flywheel 1300 Weight 2500 Are balance weights fitted? no 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) integral with crankshaft

Total No. of Visits 24



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 \_\_\_\_\_  
 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 stroke \_\_\_\_\_  
 minute at full power \_\_\_\_\_ Gas delivery pressure \_\_\_\_\_ Gas delivery temperature \_\_\_\_\_ Have the turbines and attached equipment been tested \_\_\_\_\_  
 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 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 a description and, for clutches, state how operated.

Can the main engine be used for purposes other than propulsion when declutched? *no* If so, what? \_\_\_\_\_

STRAIGHT SHAFTING. Diameter of thrustshaft \_\_\_\_\_ Material \_\_\_\_\_ Minimum approved tensile strength \_\_\_\_\_

Shaft separate or integral with crank or wheel shaft? *integral with crankshaft* Diameter of intermediate shaft *150* Material *steel*  
 Minimum approved tensile strength *44 kg/mm<sup>2</sup>* Diameter of screwshaft cone at large end *150 x 100* Is screwshaft fitted with a continuous liner? *no*  
 Diameter of tube shaft. (If these are separate shafts) \_\_\_\_\_ Is tube shaft fitted with a continuous liner in way of stern tube \_\_\_\_\_ Thickness of screw/tube shaft liner \_\_\_\_\_  
 bearings \_\_\_\_\_ Thickness between bearings \_\_\_\_\_ Material of screw/tube shaft *steel* Minimum approved tensile strength *44*  
 Is an approved oil gland fitted? *yes* If so, state type *hollow rubber ring* Length of bearing next to and supporting propeller *580*  
 Material of bearing *cast iron* 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 *1650* Pitch *956* Built up or solid *solid* Total developed surface *10300 sq ft*

No. of blades *4* Blade thickness at top of root fillet *65* Blade material *bronze* Moment of inertia of dry propeller *232 kgm<sup>2</sup>*  
 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 *cast iron* Moment of inertia *232 kgm<sup>2</sup>*

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine \_\_\_\_\_ Can they be declutched? *no*

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) *12 35 m<sup>3</sup>h driven by port aux engine, Port Cert. 30465*  
 No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) *2 main each 520 ltr., port side above each other - Port Cert. 17.815.*  
 How are receivers first charged? *hand started aux. eng.* Maximum working pressure of starting air system *30 kg.* 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 *one* No. of main engine lubricating oil coolers *one*

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure *daily service tank stbd floor level.*

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) *1 freshwater, 1 seawater, 1 lub. oil.*

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.	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
<i>12 pump 45 ltr. driven by stbd aux. engine</i>		X	X	X	X	X				X	X		X		
<i>bilge pump 23 ltr. driven by stbd. aux engine</i>	X	X	X		X	X									
<i>12 pump 45 ltr. driven by port aux. engine</i>		X	X	X	X	X				X	X		X		
<i>space lub. oil pump driven by port aux. eng.</i>								X							X
<i>BT transfer pump stbd driven electrically</i>					X							X			

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room. *4 @ 2 1/2" (1 hold)*

No. and size connected to main bilge line in main engine room *1 @ 70 mm* In tunnel \_\_\_\_\_  
 in aux. engine room \_\_\_\_\_ Size and position of direct bilge suction in machinery spaces *1 @ 70 mm*  
 Size and position of emergency bilge suction in machinery spaces *1 @ 82 mm (direct) stbd fore*  
 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? *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)
<i>port</i>	<i>2-5-108 N° 2768</i>	<i>Samoa</i>	<i>AMS Cert. dated 28-9-56.</i>	<i>compressor, g.s. pump, space lub. oil pump</i>
<i>stbd.</i>	<i>2-5-108 N° 2767</i>	<i>Samoa</i>	<i>AMS Cert. dated 28-9-56.</i>	<i>g.s. pump, bilge pump, generator @ 6 kW.</i>

Is electric current used for essential services at sea? *no* If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea \_\_\_\_\_  
 Is an electric generator driven by Main Engine? *yes*

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 Steam Engines, Electric Motors, Hydraulic Pumps and other particulars.) *Sundberg hand hydraulic*

*type 20 H1 - N° 826*  
 Have the Rule Requirements for fire extinguishing arrangements been complied with? *yes* Brief description of arrangements *3 firefoams @ 9 ltr. 1 hose connection.*

Is 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-over sea trials of main engines *3-4-57 - 5 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.

This engine and auxiliaries have been constructed and fitted under special survey in accordance with the approved plans, Society's Rules and Secretary's letters. —

The materials used are of a good quality and the workmanship was found good. —

In my opinion the machinery of this vessel merits the approval of the Committee and be recorded in the Society's Register Book # LMC 4-57 - OIL ENGINE - O.G.

*[Signature]*  
 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 *Lloyd's Gro No 586 - CAM - 26-1-57*

CRANKSHAFT OR ROTOR SHAFT *Lloyd's No No 919 - HD - 28-9-56 - CAM - 23-1-57*

FLYWHEEL SHAFT —

THRUST SHAFT —

GEARING —

INTERMEDIATE SHAFTS *Lloyd's Gro No 613 - CAM - 7-3-57*

SCREW AND TUBE SHAFTS *Lloyd's Gro No 576 - CAM - 5-12-56*

PROPELLERS *Lloyd's Gro No 580 - CAM - 17-12-56*

OTHER IMPORTANT ITEMS *Glinders: Lloyd's Test Gro 80/5 kg - CAM - 26-1-57*

*Stem tube: Lloyd's Test Gro. 3 kg - CAM - 21-11-56*

Is the installation a duplicate of a previous case? *no*

If so, state name of vessel —

Date of approval of plans for crankshaft *9-10-56*

Straight shafting *9-10-56*

Gearing —

Clutch —

Separate oil fuel tanks *31-1-57*

Pumping arrangements *7-8-56/18-9-56*

Oil fuel arrangements *12-2-57*

Cargo oil pumping arrangements —

Air receivers —

Donkey boilers —

Dates of examination of principal parts:—

Fitting of stern tube *14-12-56*

Fitting of propeller *5-12-56*

Completion of sea connections *19-12-56*

Alignment of crankshaft in main bearings *18-2-57*

Engine checks & bolts *5-3-57*

Alignment of gearing —

Alignment of straight shafting *5-3-57*

Testing of pumping arrangements *27-3-57*

Oil fuel lines *27-3-57*

Donkey boiler supports —

Steering machinery *3-4-57*

Windlass *3-4-57*

Date of Committee **TUESDAY 25 JUN 1957**

*Construction Installation Special Survey Fee*

*No. 528*

Decision *LMC*

*ES } 4  
 TS OG } 4-57*

Expenses

*744 -*

Date when A/c rendered *9-5-57*

