

Rpt. 4b

materials and workmanship and
be explained as fully as possible

Requirements of the

Surveyors to the

governing test

Book & LMC, when

Lloyd's Register of Shipping

port)

16DD,

bearings

arrangements

6-0-0

-1-0

NOV 1961

Date of writing report 9/10/61.

Survey held at Preston.

Received London

-8 OCT 1961

Port

FLEETWOOD. 941.

No.

22 NOV 1962

157697

No. of visits

In shops 7

On vessel

First date

17-3-61.

Last date

9-8-61.

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

"ARAMOANA"

No. in R.B.

Name

Gross tons

Owners New Zealand Government.

Managers

Port of Registry

Year Month

Hull built at Dumbarton.

By Wm. Denny & Bros.

Yard No.

When

Main Engines made at Preston.

By English Electric Co. Ltd.

Eng. No. I.H. 5571.

When 1961-8

Gearing made at

By

Donkey boilers made at

By

Blr. Nos.

When

Machinery installed at

By

When

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?

Is ship intended to carry petroleum in bulk?

Is refrigerating machinery fitted?

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 6

No. of propellers

Brief description of propulsion system

Diesel Electric.

MAIN RECIPROCATING ENGINES. Licence Name and Type No. English Electric Diesel. Type 16 CSVM.

No. of cylinders per engine 16

Dia. of cylinders

10"

stroke(s)

12"

2 or 4 stroke cycle 4

Single or double acting Single

Maximum approved BHP per engine

1745

at

750

RPM of engine and

250

RPM of propeller.

Corresponding MIP

145

(For D.A. engines give MIP top & bottom)

Maximum cylinder pressure

950

Machinery numeral

349

Are the cylinders arranged in Vee or other special formation?

V Formation.

If so, number of crankshafts per engine One.

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? Yes

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

No. of exhaust gas driven blowers per

engine 4

No. of supercharge air coolers per engine 4

Supercharge air pressure 10" Hg.

Can engine operate without supercharger? Yes.

TWO & FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel One

Inlet Two

Exhaust Two

Starting One

Safety One

Material of cylinder covers Cast-iron

Material of piston crowns Aluminium Alloy

Is the engine equipped to operate on heavy fuel oil? No

Cooling medium for: Cylinders Fresh Water

Pistons None

Fuel valves Oil Fuel

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 98 cu.ft.

No. and total area of explosion relief

devices 4 - 112 sq.in.

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? No.

Is the engine secured directly to the tank top or to a built-up seating? Built up seating. How is the engine started? Compressed air.

Can the engine be directly reversed? No.

If not, how is reversing obtained? Electric Motor Propulsion.

Has the engine been tested working in the shop? Yes.

How long at full power? 6 hours.

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system

4-5-61.

State barred speed range(s), if imposed

for working propeller None.

For spare propeller None.

Is a governor fitted? Yes

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

Where positioned?

Type

No. of main bearings 9

Are main bearings of ball or roller

type?

Distance between inner edges of bearings in way of crank(s) 13"

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 8 1/2"

Diameter of crankpins

Centre 7 1/2"

Breadth of webs at mid-throw 11 1/2"

Axial thickness of webs 27 1/2"

If shrunk, radial thickness around eyeholes

Are dowel pins fitted?

Crankshaft material Journals O.H. Steel

Minimum

Diameter of flywheel 4' 10 1/2"

Weight 2880 lb.

Are balance weights fitted? No

Total weight No

Radius of gyration

Diameter of flywheel shaft 8 1/2"

Material O.H. Steel

Minimum approved tensile strength

36 T.p.s.i.

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

Integral with crankshaft.



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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 _____
 minute at full power _____ Gas delivery pressure _____ Gas delivery temperature _____ Have the turbines and attached equipment been tested work 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 6 KW per generator 1220 at 750 RPM AC or DC? DC Position _____
 No. of propulsion motors _____ SHP per motor _____ at _____ RPM Position _____
 How is power obtained for excitation of generators? Separate excitation. 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 _____ No. and size connected _____
 Material of pinions _____ Tensile strength _____ Material of wheel rims _____ Tensile strength _____ In aux. engine room _____
 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? _____
 Is the bilge or ballast special requirements for _____

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 thrustshaft _____ Material _____ Minimum approved tensile strength _____
 Shaft separate or integral with crank or wheel shaft? _____ Diameter of intermediate shaft _____ Material _____
 Minimum approved tensile strength _____ Diameter of screwshaft cone at large end _____ Is screwshaft fitted with a continuous liner? _____
 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 _____
 bearings _____ Thickness between bearings _____ Material of screw/tube shaft _____ Minimum approved tensile strength _____
 Is an approved oil gland fitted? _____ If so, state type _____ Length of bearing next to and supporting propeller _____
 Material of bearing _____ 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 _____ Pitch _____ Built up or solid _____ Total developed surface _____
 No. of blades _____ Blade thickness at top of root fillet _____ Blade material _____ Moment of inertia of dry propeller _____
 If propeller is of special design, state type _____ Is propeller of reversible pitch type? _____ If so, is it of approved design? _____
 State method of control _____ Material of spare propeller _____ Moment of inertia _____

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) _____

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) _____

How are receivers first charged? _____ Maximum working pressure of starting air system _____ Are the safety devices _____
 accordance with the Rules? _____ Has the starting of the main engines been tested and found satisfactory? _____

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 _____

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 2 - Lube-oil Pumps (Oil press. Lubricated)

Fuel injection pumps
 LR-FAP-TB17-41

2 - F.W. Circulating Pumps (Jacket circulated)



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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: Bilge Main, Bilge Direct, Ballast Main, Oil Fuel, Fresh Water Cooling, Sea, Feed Tanks, Lub. Oil
DELIVERY: Boiler Feed, Salt Water Cooling, Fresh Water Cooling, Oil Fuel Tanks, Fire Main, Lub. Oil, Piston Cooling

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room
No. and size connected to main bilge line in main engine room
In aux. engine room
Size and position of direct bilge suction in machinery spaces
Size and position of emergency bilge suction in machinery spaces
Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side?
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).

STEAM & OIL ENGINE AUXILIARIES
Table with 5 columns: Position of each, Type, Made by, Port and No. of Rpt. or Cert., Driven Machinery (For electric generators, state output)

Is electric current used for essential services at sea?
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?
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)
Are the safety devices
Have the Rule Requirements for fire extinguishing arrangements been complied with?
Brief description of arrangements
Has the spare gear required by the Rules been supplied?
Has all the machinery been tried under full working conditions and found satisfactory?
Date and duration of full-power sea trials of main engines
Does this machinery installation contain any features of a novel or experimental nature? (Give particulars)

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)
Chief Inspector.
DIESEL ENGINE & TRACTION.
Lloyd's Register Foundation

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 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 machinery has been constructed under Special Survey in accordance with the Requirements of the Rules, Approved Plans, and Secretary's letters.

The materials used in the construction have been tested under supervision of the Surveyors to the Society, found satisfactory and workmanship good.

The machinery has been examined during full power, overload, fractional loads and governing test bed running and found satisfactory.

The machinery as now seen, is eligible in my opinion to be classed in the Register Book & LMC, when efficiently installed and tested.

J. A. del Santos
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 'A' Bank - S2161, S2159, S2161, S2160, S2160, S2159, S2161, S2160.

'B' Bank - S2160, S2159, S2160, S2160, S2160, S2160, S2159, S2160.

CRANKSHAFT OR ROTORSHAFT EEP 4987. LLOYDS SHF. J9783. H.C. 18-5-61.

FLYWHEEL SHAFT

THRUSTSHAFT

GEARING

INTERMEDIATE SHAFTS

SCREW AND TUBE SHAFTS

PROPELLERS

OTHER IMPORTANT ITEMS Turbo-chargers Type M.S.200 Nos. 204/2016/16DD, 204/2015/16DD, 204/2011/16DD, 204/2010/16DD.

Lube-oil Cooler - M.L. 1162. F.W. Circulating Pumps - Nos. F68311, F68319.

Turbo Charger Inter Coolers - IB 3610, IB3611, IB3612, IB3613.

| | | | |
|---|---------------------------|--|---------------------------------|
| Is the installation a duplicate of a previous case? | No. | If so, state name of vessel | - |
| Date of approval of plans for crankshaft | 6 - 2 - 61. | Straight shafting | 5 - 5 - 61. |
| Separate oil fuel tanks | | Pumping arrangements | |
| Cargo oil pumping arrangements | | Air receivers | |
| Dates of examination of principal parts:- | | Alignment of crankshaft in main bearings | |
| Fitting of stern tube | Fitting of propeller | Completion of sea connections | |
| Engine chocks & bolts | Alignment of gearing | Alignment of straight shafting | Testing of pumping arrangements |
| Oil fuel lines | Donkey boiler supports | Steering machinery | Windlass |
| Date of Committee | LIVERPOOL 27 NOV 1961 | Special Survey Fee | £136 - 0 - 0 |
| Decision | Deferred for comp'n class | Expenses | £7 - 1 - 0 |

Date when A/c rendered

1 NOV 1961

