

Date of writing report 19.7.62 Received London Port GLASGOW. No. Q3652. Survey held at DUMBARTON. No. of visits In shops 88 First date 23.5.61. Last date 18.6.62.

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 52112 Name Twin Diesel-Electric Ferry "ARAMOANA" Gross tons 4700

Owners New Zealand Government Managers - Port of Registry Wellington Year Month

Hull built at Dumbarton By Wm. Denny & Bros. Ltd. Yard No. 1502 When 1962-6.

Main Engines made at Preston. By English Electric Co. Ltd. Eng. No. I.H.5569 to I.H.5574 When 1962-6.

Gearing made at - By -

Domestic Donkey boilers made at London. By J. Stone & Co. (Deptford) Ltd. Blr. Nos. 20979. When 1962-6.

Machinery installed at Dumbarton. By Wm. Denny & Bros. Ltd. When 1962-6.

Particulars of restricted service of ship, if limited for classification Train Ferry for New Zealand Service.

Particulars of vegetable or similar cargo oil notation, if required Not 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 Methyl Chloride.

Is the refrigerating machinery compartment isolated from the propelling machinery space? Yes. 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 2 Brief description of propulsion system Diesel Electric- Motors coupled direct to Propellers.

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

No. of cylinders per engine 16 Dia. of cylinders 10 1/2 stroke(s) 12" 2 or 4 stroke cycle 4 Single or double acting Single

Maximum approved BHP per engine 1765 at 750 RPM of engine and 250 RPM of propeller.

Corresponding MIP 149 p.s.i. (For DA engines give MIP top & bottom) Maximum cylinder pressure 950 p.s.i. Machinery numeral 2118

Are the cylinders arranged in Vee or other special formation? Vee 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 Fresh Water Pistons None Fuel valves Oil 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? Built-up seating How is the engine started?

Can the engine be directly reversed? If not, how is reversing obtained? 157695/70.

Has the engine been tested working in the shop? How long at full power? 2.3-61

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 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 Side Pins Minimum

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)



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
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 6 KW per generator 1220 at 750 RPM AC or DC? D.C. Position Ford. Engine Room - Port, Centre Aft
No. of propulsion motors 4 SHP per motor 2250 at 250 RPM Position Motor Room - Port & Starboard, Ford. & Aft
How is power obtained for excitation of generators? Motor Driven Exciters supplied from Motors? As generators. 400 Volt Auxiliary Supply.

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 12" Material S.M. Steel Minimum approved tensile strength 28 tons.
Shaft separate or integral with crank or wheel shaft? Separate Diameter of intermediate shaft 11" Material S.M. Steel
Minimum approved tensile strength 28 tons Diameter of screwshaft cone at large end 13 1/4" 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 S.M. Steel Minimum approved tensile strength 31
Is an approved oil gland fitted? Yes If so, state type Cedervall Length of bearing next to and supporting propeller 5'-3"
Material of bearing White Metal 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? No

PROPELLER. Diameter of propeller 9'-8" Pitch 9'-7 1/2" mean Built up or solid Solid Total developed surface 40 sq. ft.
No. of blades 4 Blade thickness at top of root fillet 5.62" Blade material Novoston Moment of inertia of dry propeller WR^2 = 21,100
If propeller is of special design, state type Heliston Is propeller of reversible pitch type? No If so, is it of approved design?
State method of control Material of spare propeller Novoston Moment of inertia WR^2 = 21,100 lb

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) Main: Two 50 cu. ft. min. capacity each, electric motor driven, one in ford. and aft. engine rooms. SOU.D.18055 & D.18064. Aux: One 18 cu. ft. min. capacity, electric motor driven in Aux. Eng. Room SOU.D.17937. Emergency: One 18 cu. ft. min. capacity, Diesel eng. driven on flat in aft. engine room.
No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Main: Two 44 cu. ft. capacity each in ford. engine room, starboard side ford. and aft. Two 44 cu. ft. capacity each in aft. engine room, port side ford. and aft. Aux: Two 44 cu. ft. capacity each on flat in Aux. engine room, port, centre & starboard. NOT.C. 34224 to C.34800. One for Domestic Unit in Boiler house on boat deck, capacity 5.25 cu. ft. GLS. C.76158.
How are receivers first charged? Hand Start Diesel Engine Driven Air Compressor. Maximum working pressure of starting air system 350 p.s.i. 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 4 No. of main engine lubricating oil coolers 6
OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure Emergency Generators Service Tank on Boat Deck. Domestic Boiler Unit service tank on Boat Deck. Service Tank in Ford. E.R. on flat port side, Service Tank in Ford. E.R. on Flat, Aft. Service Tank in Aux. Eng. Room on Flat Starboard Side.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) See Fleetwood F.E. Rpt. Nos. 935-6; 941 to 944 (Liv. Nos. 157695 to 157700)
16 Fuel Injection pumps and one fuel oil Booster pump each Engine.

LR-FAF-TB17-39

INDEPENDENTLY DRIVEN AIR COMPRESSORS. Name below essential how driven. Give details.
All Pumps and Bilge & Ballast Pumps. S.W. Circulation 113 tons/hr. Fire & Bilge Pumps 100/55 tons/hr. St. By. F.W. Circulation Fuel Oil Transfer Lub. Oil Priming Bilge & Ballast Pumps 500/100 tons/hr. St. By. S.W. Circulation 20 tons/hr. St. By. F.W. Circulation Fire & Washdown Lub. Oil Priming St. By. S.W. Circulation 280 tons/hr. St. By. F.W. Circulation Fuel Oil Transfer Oily Bilge Pumps S.W. Circulation Lub. Oil Priming S.W. Cooling Emergency Fire Pumps 100/55 tons/hr.
BILGE SUCTIONS. 1-2 1/2" bore
No. and size connections
In aux. engine room
P & S. Aux. Engine Room
Aft Eng. Room:
Is the bilge or ballast
Special requirements for
Position
Port, Centre
Starboard in
Engine Room.
Emergency Generator
House on Boat Deck
Is electric current used at sea One 450
STEAM INSTALLATION. Position In Boat
Is a superheater fitted?
Type
the steam range or do
boilers London
material?
units One
STEERING GEAR. (
2 V.S.G. Pump
Have the Rule Requirements
2 - 60 ft.
Has the spare gear required
power sea trials of main
The foregoing description



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	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Over Board
All Pumps are elec. motor driven.															
S.W. Circulating, Port side ford. 113 tons/hr. 45 ft. Head		X				X				X					X
Fire & Bilge Port Side Inbd. 100/55 tons/hr. 42/150 ft. head	X	X			X	X				X			X		X
St. By. F.W. Circ. Port Side				X								X			
Fuel Oil Transfer, Port Side								X						X	
Lub. Oil Priming, Port, Centre & Starbd. aft						X							X		
Bilge & Ballast, Port & Starbd. 500/100 tons/hr. 35/55 ft. head	X	X	X			X								X	X
St. By. S.W. Circ. Port Side. 20 tons/hr. 35 ft. head		X				X				X					X
St. By. F.W. Circ.				X											
Fire & Washdeck, Starbd. Side						X							X		
Lub. Oil Priming, Port, Centre & Starbd. ford.								X						X	
St. By. S.W. Circ. Starbd. Side 280 tons/hr. 50 ft. head		X				X				X				X	X
St. By. F.W. Circ. Starbd. Side				X								X			
Fuel Oil Transfer Starbd. Aft												X			
Oily Bilge, Starbd. Aft 5 tons/hr.		X													X
S.W. Circ. Port Aft. 113 tons/hr.		X				X				X					X
Lub. Oil Priming, Port, Centre & Starbd. ford.								X						X	
S.W. Cooling, Port & Starbd. Aft						X				X					
Emergency Fire & Bilge, Starbd. side 100/55 tons/hr. 42/150 ft. head	X	X				X							X		X

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room. Dry Space Ford: 1-2 1/2" bore, No. 1 Hold: 1-2 1/2" bore p & s. No. 2 Hold: 1-2 1/2" bore p & s. No. 3 Hold: 1-2 1/2" bore p & s. Ford & Aft: 1-2 1/2" bore in each. Dry Tanks P & S.

No. and size connected to main bilge line in main engine room. Ford, Eng. Room: 2-2 1/2" bore. Aft, Eng. Room: 2-2 1/2" bore. Motor Room: 1-2 1/2" bore. In tunnel 1-2 1/2" bore. Gland Compt: 1-2 1/2" bore.

In aux. engine room 2-2 1/2" bore. 1-3" p. Size and position of direct bilge suction in machinery spaces. Ford, E.R. 1-4 1/2" bore.

P & S. Aux. Eng. Room 1-4 1/2" Bore P & S. Size and position of emergency bilge suction in machinery spaces. Motor Room: 1-4 1/2" Bore - Starbd. Side. Aft Eng. Room: 1-4 1/2" Bore P & S.

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? Yes. Do the piping arrangements comply with the Rules Yes.

Special requirements for ships carrying petroleum in bulk, cargo oil or closed 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, Centre and Starboard in Aux. Engine Room.	6 CS RKM	English Electric Co. Ltd.	Liverpool Rpt. 157760.	Each Engine Drives one 450 k.w. Alternator.
Emergency Generator House on Boat Deck.	Rolls Royce C8/TFL	Petrow Ltd.	London D.83147	One 200 k.w. 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 450 k.w.

Is an electric generator driven by Main Engine? No.

STEAM INSTALLATION. No. of donkey boilers burning oil fuel One W.P. 115 p.s.i. Type Stone Vapour Type OK 4740.

Position In Boiler House on Boat Deck.

Is a superheater fitted? No. Are these boilers also heated by exhaust gas? No. No. of donkey boilers heated by exhaust gas only? - W.P. -

Type - Position - Can the exhaust heated boilers deliver steam directly to domestic the steam range or do they operate only as economisers in conjunction with oil fired boilers? - Port and No. of report on 406109

boilers London 146525 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? -

For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes. No. of oil burning pressure units One No. of steam condensers None No. of Evaporators None

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) Electro-Hydraulic 2 Motors

2 V.S.G. Pumps. Brown Bros. No. H3591. Leith Cert. No. C.12013. Voith Schneider Bow Lateral Thrust Propeller, Leith Cert. C.12482.

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes. Brief description of arrangements CO2 System in all Eng. & Blr. Rooms. 2 - 60 ft. Hoses in each Room. 30 Gall. & 2 Gall. Extinguishers in each Eng. Room. 4 - 2 Gall. "Pyrene" in Motor Room.

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 8.6.62. 8 Hrs. 18.6.62. 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).

WILLIAM DENNY & BROS., LTD.

J. R. Lopping



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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 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 installed under Special Survey in accordance with the Rules, approved plans and Secretary's letters and materials and workmanship are good. Upon completion the machinery was tested under working conditions with satisfactory results and is eligible in my opinion, to be classed the Register Book with record of +IMC 6,62 with notation s 6 oil engines 4SA connected to 4 electric motors, one domestic boiler 115 lbs. O.G. p & s Directional propeller forward.

Rockwell sea valves

A.B. Sinclair
 Engineer Surveyor to Lloyd's Register of Shipping.
 (A.B. SINCLAIR)

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 Port: - Leith 3840 W.C. 16.5.61.
Starbd. Lth 3839 W.C. 16.5.61.

GEARING

INTERMEDIATE SHAFTS Port :- (1) Gls.2315 B.G.4212 19.6.61.(2) Gls.2333 B.G.4215 22.6.61.(3) Gls.2337 B.G.4215 22.6.61.
Starbd. (1) Gls.2314 B.G.4211 19.6.61.(2) Gls.2334 B.G.4214 22.6.61.(3) Gls.2338 B.G.4216 22.6.61.

SCREW AND TUBE SHAFTS

Port: Gls.2312 B.G.4218 19.6.61. Starbd. Gls.2309 W.H.4217 15.6.61. Stamped P.B. Gls.16.11.61.

PROPELLERS

Port: Gls.73466 D.F.M. 6.10.61. Q.4829. Starbd. Gls.73039 D.F.M. 6.10.61. Q.4830.

OTHER IMPORTANT ITEMS

Port Loose Coupling: Gls.2323 B.G. 4221 19.6.61. Starbd. Loose Coupling: Gls.2322 B.G.4222 19.6.61. Spare Loose Coupling: Gls.2324 B.G.4222 19.6.61. All Stamped P.B. Gls. 20.10.61. Spare Screw Shaft Gls. K.F.4219 31.8.61. and P.B. Gls. 28.11.61. Port Spare Propeller: Gls.74222 A.B.S. 22.11.61. Q.4831 Starbd. Spare Propeller: Gls.74714 A.B.S. 12.12.61. Q.4832.

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 4.5.61. Gearing - Clutch -
 Separate oil fuel tanks 16.11.61. Pumping arrangements 6.9.61. Oil fuel arrangements 15.8.61.
 Cargo oil pumping arrangements - Air receivers for Steam Generator 16.11.61. Donkey boilers -

Dates of examination of principal parts:-

Port. 20.10.61. Port. 1.11.61. Alignment of crankshaft in main bearings 16.1.62
 Fitting of stern tube Stbd. 25.10.61. Fitting of propeller Stbd. 7.11.61. Completion of sea connections 21.11.61. Alignment of crankshaft in main bearings 23.1.62
 Engine chocks & bolts Aft. E.R. 16.1.62. Alignment of gearing - Alignment of straight shafting 12.1.62. Testing of pumping arrangements
 23.1.62. Oil fuel lines 24.4.62. Donkey boiler supports 16.5.62. Steering machinery 8.6.62. Windlass 8.6.62.

Date of Committee

GLASGOW 21 AUG 1962

FRIDAY - 2 NOV 1962

Decision

Transmit to London

+ L M E S

JBS } 6.62
 TS(03)

Special Survey Fee Installation: £244.10

Air Receiver: £5.

Expenses £9.

Date when A/c rendered 29.6.62

Rpt. 4b

Date of writing report

Survey held at Pres

FIRST EN

No. in R.B.

Owners New Zealand

Hull built at Dumb

Main Engines made at

Gearing made at

Donkey boilers made at

Machinery installed at

Particulars of restricted ser

Particulars of vegetable

Is ship to be classed for nav

Is refrigerating machinery

Is the refrigerating machin

The following particulars

No. of main engines

MAIN RECIPRO

No. of cylinders per engine

Maximum approved BHP

Corresponding MIP

Are the cylinders arranged

TWO STROKE ENGIN

Is the exhaust discharged

engine and how driven

No. of exhaust gas driven

If a stand-by or emergen

power

FOUR STROKE ENGIN

engine 4 No.

TWO & FOUR STRO

Material of cylinder cover

Cooling medium for :- Cy

Is the rod fitted with a sle

underside of pistons?

devices 4 - 112 sq

overhaul of bearings, etc?

Can the engine be directl

Has the engine been teste

CRANK & FLYWHEEL

for working propeller

Where positioned?

type? Distar

Crankshaft type: Built, ser

Diameter of journals

If shrunk, radial thickness a

Diameter of flywheel

Diameter of flywheel shaft

Flywheel shaft: separate, fr

