

REPORT ON ELECTRIC PROPELLING MACHINERY

No. 20458
26 OCT 1950

Date of writing Report 29th Sep 1950 When handed in at Local Office 19 Port of Southampton
No. in Survey held at Southampton Date, First Survey 20 May 1948 Last Survey 16th August 1950
Reg. Book. 70354 No. of Visits 1

Single
on Twin
Triple
Quadruple) Screw vessel "NEW AUSTRALIA" Gross 22424 Tons
Net 12876
Built at Newcastle-on-Tyne By whom built Vickers Armstrong Ltd Yard No. 665 When built 1931
Electrical Machines made at Wilton By whom made General Electric Co Generator Nos. Pat. D. 9667, Pat. B. 9666 When made 1931
Motor Nos. Pat. Nos. B. 9787, Pat. Nos. B. 9788, Pat. Nos. B. 9785, Pat. Nos. B. 9786
Shaft Horse Power at Full Power 19000 Total Capacity of Generators 15000 kilowatts
Machinery Numeral as per Rule 3166 4411 Owners Ministry of Transport Port belonging to London
Trade for which Vessel is intended Emigrant Passengers

PLANS.— Have plans of the Machines, Control Gear, Cables and Circuits been submitted and approved

STEAM ENGINES.— Type of Engine Multistage impulse Turbine No. of Engines 2 R.P.M. 3000 Is a Governor fitted Yes Is the speed variation as per Rule when load is thrown off Yes Is an Emergency Governor fitted Yes Is it arranged for hand tripping Yes Does it trip the throttle valve Yes If exhaust steam is admitted, is an automatic shut-off fitted Yes Is provision made for bled steam Yes and is a non-return or positive shut-off valve fitted Yes Lubricating Oil.— State means provided for emergency supply Auxiliary Steam driven pump and automatic electric driven rotary oil pump. Is the emergency reserve sufficient to maintain lubrication as per Rule Yes Mechanical Balance.— Are the Engines and Generators balanced so as not to cause appreciable vibration Yes

OIL ENGINES.— Type of Engines Yes R.P.M. Yes Is a Governor fitted Yes Is the speed variation as per Rule when load is thrown off Yes Is an Emergency Governor fitted Yes Does it operate as per Rule Yes

GENERATORS.— Direct or Alternating Current A.C. No. of Generators 2 If A.C. state frequency at full load 50 Kw. per Generator 7500 Volts per Generator 3000 Amps. per Generator 1443 Have certificates of works tests been supplied Yes and the results found as per Rule Yes Ventilation.— State how arranged (open or closed system) closed Are ventilating arrangements satisfactory Yes Heating when Idle.— What provision is made Electric Heaters Facilities for Inspection and Repair.— Are these as per Rule Yes Are wear-down gauges supplied Yes Bilges.— Are the arrangements to prevent accumulation of bilge-water under the machines satisfactory Yes

MOTORS.— S.H.P. per Motor at full power 4750 No. of Motors 4 Single or double unit single Volts per Motor 3000 Amps. per Motor 682 Have certificates of works tests been supplied Yes and the results found as per Rule Yes A.C. Motors.— Is provision made for machining the slip rings Yes Do the Motors remain in synchronism under all normal conditions of running Yes D.C. Motors.— If the system permits overspeeding at light loads are overspeed protection devices fitted Yes

EXCITATION.— Is power for excitation taken from the ship's Auxiliary Generators Yes If so, state voltage 220 and excitation amperes at full power 184 kilowatts for excitation 40 State excitation arrangements for Propulsion Generators Ship's auxiliary generators and boosters for overspeeding (Normal excitation 220 volts) and Propelling Motors as above Is an alternative means of excitation provided Port 6 started 220 v Bus Bars (Duplicate Booster sets) Have certificates of works tests been supplied Yes and found as per Rule Yes

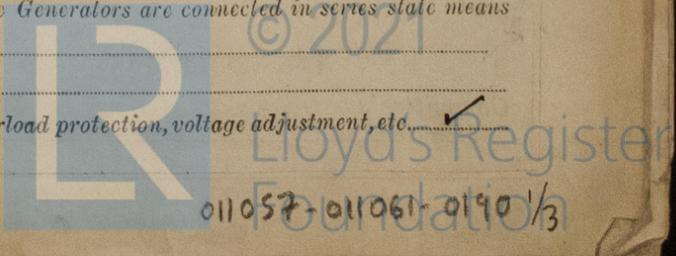
CONTROL.— Position of Main Control Panel amidships - main engine room Does it comply with the requirements regarding position Yes, grouping of controls Yes, instruments Yes, insulating materials (state type used) Moulded Micanite, spacing and shielding of live parts Yes, accessibility Yes, position of fuses Yes, locking of screws and nuts Yes, labelling Yes, fuses for voltmeters, pilot lamps, etc. Yes, provision for manual operation of contractors, etc. (state method employed) Emergency handwheels provided operating mechanically on the master and Field contractors. earthing of instrument cases above 250 volts to earth Yes, provision of renewable tips on switches subject to arcing Yes, capability of withstanding shock and inclination Yes, operation with high and low voltage Yes, rust proofing of parts Yes Overload and Short Circuit Protection.— State means provided M.C.C. relay. Provides protection against phase to earth and phase to phase faults for Alternators and Motors. At what load is it set to operate See General Remarks Has it been tripped by hand when running at full power and found satisfactory See General Remarks Are fuses of an approved type Yes

Earth Detection.— Is the main circuit provided with means for detecting earths Yes Are aural and visual alarms fitted Yes Is main power interrupted by an earth fault Yes If a limiting resistance is in the earth detecting circuit what is the ohmic value Yes What earth leakage current is necessary to operate the device See General Remarks If a switch is used to disconnect the aural signal does it automatically give visual indication Yes Are the excitation circuits provided with means for earth detection Yes Mechanical Protection.— Are circuits above 250 volts to earth protected as per Rule Yes

Bridge or Deck Control.— Is bridge control provided Yes If so, from how many stations Yes can it be operated freely without producing currents or loads in excess of the working capacity of the plant Yes and without reference to electrical instruments Yes Is an emergency control provided in the engine room Yes and can the transfer to this control be made quickly in the engine room Yes Can the emergency control be rendered mechanically independent of the deck control Yes Instruments and Gauges.— State Instruments provided for each Generator Wattmeter; Voltmeter; Acc. Field Voltmeter; Stability Indicator; Ammeter; Speed Indicator; Shaft H.P. Meter; Temp. Indicator; and for each Motor Voltmeter; Ammeter; Wattmeter; Speed Indicator Is an Insulation Tester provided Yes

Discharge Protection.— Are all shunt field circuits protected as per Rule Yes D.C. Systems.— If the Generators are connected in series state means provided to prevent reversal of direction of rotation of the Prime Movers Yes

Are the Propulsion Generators also used alternatively for other purposes No If so, is provision made for overload protection, voltage adjustment, etc. Yes



Reversing Switches.—If any are provided are they interlocked as per Rule. Yes Resistances.—Are resistances for synchronous motor fields insulated as per Rule. Yes Temperature Alarm.—Are machines with enclosed ventilating system, etc., fitted with temperature alarm. Yes

CONDUCTORS & CABLES.—Are all essential Conductors stranded as per Rule. Yes Are the ends of Paper and Varnished Cambric Insulated Cables sealed. Yes Are all Cables carrying A.C. constructed and installed as per Rule. Yes Have all Cables been tested at the makers' works. ✓

SECONDARY BATTERIES.—Are Batteries used for starting Main Propulsion Engines. No If so, have full particulars of rating been submitted and approved. ✓ Have they been tested under working conditions and do they give the required number of starts. ✓ Are they installed as per Rule. ✓ Are the charging arrangements satisfactory. ✓

SPARE GEAR.—If engaged on open sea service has a list of spare gear been submitted and approved. Yes Is a list of the articles supplied attached to this report. Yes Are they stored as per Rule. Yes

ELECTRIC PROPULSION EQUIPMENT CONDUCTORS.

DESCRIPTION	CONDUCTORS.		TOTAL MAXIMUM CURRENT—AMPERES.*		MAXIMUM VOLTAGE TO EARTH.	INSULATED WITH.	DI-ELECTRIC THICKNESS.	HOW PROTECTED.	
	No. per Pole.	Nominal Area per Pole.	In Circuit.	Rule.					
MAIN GENERATORS	3	1.35	1443	✓	1476	1700	V.C.	0.14	Lead sheath & braided
GENERATOR FIELDS	1	0.6	255	✓	660	✓	V.C.	0.09	" " " "
MAIN MOTORS	3	1.35	682	✓	1476	1700	V.C.	0.14	" " " "
MOTOR FIELDS	1	0.2	200	✓	314	✓	V.C.	0.07	" " " "
CONTROL CIRCUITS									
OTHER CIRCUITS:—									
Booster main	1	0.06	105	✓	143	✓	V.C.	0.07	" " " "
Supply	1	0.6	255/510	✓	660	✓	V.C.	0.09	" " " "

*For field circuits the "Hot" and "Cold" value should be given.

The foregoing is a correct description,

Electrical Engineers.

Date

COMPASSES.—Are Single-Conductor circuits carrying direct current arranged with lead and return Conductors fitted as close to one another as possible

Have tests been made during adjustment of the Compasses to determine the effect of switching the main circuits on and off.

Builders' Signature.

Date

Is this machinery duplicate of a previous case. No If so, state name of vessel. ✓

The electric propelling machinery was constructed and fitted under special survey in 1931.

General Remarks (State quality of workmanship, opinions as to class, &c.) The foregoing represents the equipment as fitted in the vessel and has been prepared for record purposes. For details of repairs effected at this time please see Rpt. 9.

The electric propelling machinery was tried under working conditions at sea and found satisfactory in operation. Owing to rough weather it was not considered desirable to operate the overload trip when running at full power. Tests simulating overload conditions by short-circuiting the transformer secondary winding in one phase and running each alternator in turn alongside quay proved that the protective system was effective and overaged tests on each machine were made to prove operation of emergency overage trips. It was also proved that all motors remained in slip satisfactorily with widely fluctuating load, rough sea conditions having been encountered during trials. The electric propelling machinery is now in our opinion in good order and safe working condition eligible for the class notation recommended (Please see Rpt. 9)

The amount of Entry Fee ... £ : : When applied for, 19
Travelling Expenses (if any) £ : : When received, 19

B. Antinson and J.H. Tickell.
Surveyor to Lloyd's Register of Shipping.

Date FRI. 19 JAN 1951

Committee's Minute

T.E.V. "NEW AUSTRALIA"

Electric Propelling Machinery and Auxiliary Electrical Installation

Repairs

Propulsion Equipment

Alternators: Rotors removed, journals ground and new timing gear pinions fitted. Cover of driving end slip ring of port rotor removed for examination of connection to ring. Rotors re-balanced, H.V. tests of 1500 volts A.C. for 1 minute applied and insulation resistance measured before and after H.V. tests (Certificate No. 8 attached) Stators examined and insulation resistance between phases and between phase and earth found to be greater than 20 megohms (including cables)

Motors: Selected stator coils lifted for examination of state of insulation and condition of core and subsequently replaced. Front end of port main motor stator winding re-maintained and joints in stator winding of starboard main motor, previously opened and re-made and not considered satisfactory, re-made and re-maintained. All four stators re-wedged with wedges of reinforced bakelite. On completion H.V. tests of 4000 volts A.C. for 1 minute applied between phases and between phase and earth and insulation resistance measured before and after H.V. test. (Certificates Nos. 1, 2 and 3 attached) Rotor coils of all four motors returned to makers for re-maintenance of spools and re-fitted. H.V. tests of 1500 volts A.C. for 1 minute between rotor windings and earth applied and insulation resistance measured before and after H.V. test. (Certificates Nos. 4, 5, 6 and 7 attached)

Cables: Operating and control gear overhauled and all secondary wiring renewed. Insulation resistance of high and low voltage equipment measured on completion and found satisfactory

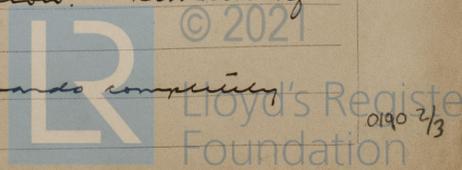
Cables: Cracks in lead sheath of one of main cables to port motor made good and insulation cables to starboard motor and main motor renewed from cables to motor

Auxiliary Electrical Installation

Generators: Armature of No. 1 machine replaced by spare and repaired for use as spare (end voltages were found to have spread) All four turbo-generators overhauled and placed in good order. Emergency generator re-conditions.

Motors: All motors which had been submitted rewound and underco, capacitor, wind and steering gear motors overhauled and placed in good condition. Remaining motors and control gear re-conditions

Switchboards All auxiliary switchboards completely



T.E.V. "NEW AUSTRALIA"

Electric Propelling Machinery and Auxiliary Electrical Installation
Repairs (Continued)

overhauled and placed in good order, stunc trip coils
control coils, brushes etc being renewed as necessary.

Cables: Subs-generators cables on port side damaged by
heat renewed. and cables in main and auxiliary
engine rooms, boiler rooms and propelling motor room
renewed almost in their entirety. Cable runs through
boiler room in way of oil fuel side tanks re-sited where
cables renewed.

For particulars of electric propelling machinery and new
auxiliary electrical installation and recommendations
see Rpts. 4d. and 13

Barnison and F.H. Tickell.