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# REPORT ON ELECTRIC PROPELLING MACHINERY.

No. 104293

26 FEB 1947

Received at London Office

Date of writing Report 11<sup>th</sup> FEBRUARY 1947 When handed in at Local Office 21. 2. 47 Port of NEWCASTLE-ON-TYNE

No. in Survey held at HEATON  
Reg. Book.

Date, First Survey (1946) July 2 19 Last Survey 11<sup>th</sup> FEBRUARY 1947

Number of Visits 11

Single  
on Twin  
Triple  
Quadruple } Screw vessel

"BEAVERCOVE"

Tons { Gross 9824  
Net 5818

Built at GLASGOW.

By whom built FAIRFIELD & CO. LTD.

Yard No. 728 When built 1947.

Electrical Machines made at HEATON

By whom made C.A. PARSONS & CO. LTD.

Contract No.  
Generator No. M. 2693 A. 2695  
Motor No. 2694 } When made 1947.

Shaft Horse Power at Full Power 9000 ✓

Total capacity of Generators 7000 + 400 kilowatts

Nom. Horse Power as per Rule 1500 ✓ Owners CANADIAN PACIFIC RAILWAY CO. LTD.

Port belonging to LONDON.

Trade for which Vessel is intended LONDON - MONTREAL FREIGHT.

TEAM ENGINES.—Type of Engine HIGH PRESSURE STEAM TURBINE. ✓ No. of Engines ONE. ✓ Revs. per minute 3450 ✓

Is a Governor fitted YES ✓

Is the speed variation as per Rule when load is thrown off -

Is an emergency Governor fitted YES ✓

Is it arranged for hand tripping YES ✓

Does it trip the throttle valve as per Rule YES ✓

automatic shut-off fitted -

Is provision made for bleeding steam YES ✓

If exhaust steam is admitted, is an

is a non-return or positive shut-off valve fitted TO BE PROVIDED BY BUILDERS.

Torque Limiting.—If generator capacity exceeds motor rating, state means provided for limiting torque input to screw shaft WHEN OPERATING ON HALF

MOTOR TRAVEL OF GOVERNOR VALVE LIMITED BY INTERLOCKING STOP ON CONTROL CUBICLE. ✓

Lubricating Oil.—State what means are provided for emergency supply GRAVITY TANK. ✓

Is the emergency reserve sufficient to maintain lubrication as per Rule -

Mechanical Balance.—Are the Engines and Generators balanced so as not to cause appreciable vibration YES ✓

Report.—Has a separate report Rpt. 4a for the Engines been issued YES. ✓

IL ENGINES.—Type of Engines -

Rev per minute -

Is a Governor fitted -

Is the speed variation as per Rule when load is thrown off -

Is an Emergency Governor fitted -

Does it operate as per Rule -

Rating.—Has each Engine been tested and found to be capable of developing 10 per cent. overload for one hour as per Rule -

Report.—Has a separate report Rpt. 4b for the Engines been issued -

GENERATORS.—Direct or Alternating Current ALTERNATING CURRENT. ✓

No. of Generators 1 - MAIN + 1 - AUXILIARY.

For alternating current state number of phases THREE ✓

frequency MAIN - 57.5 AND AUXILIARY - 22.

Kilowatts per Generator MAIN - 7000 AND AUXILIARY - 400.

Voltage per Generator MAIN - 3000 AND AUXILIARY - 1150.

Amperes per Generator MAIN - 1347.

Do they comply with the requirements regarding insulation materials. YES ✓

Terminals. YES ✓, coolers YES ✓

thermometers YES ON BEARINGS ONLY. ✓

Lubrication YES ✓, position in ship -

temperature rise YES. ✓

Embedded temperature detectors YES ✓

shaft currents. YES. ✓

Ventilation.—State how this is arranged (open or closed system) MAIN - CLOSED SYSTEM. ✓

AUXILIARY - OPEN SYSTEM. ✓

open system are ventilating arrangements satisfactory. YES. ✓

Heating when Idle.—State what provision is made FOR MAIN ALTERNATOR ONLY 2-1/2 KW. ELECTRIC HEATERS EACH END IN WINDING COMPARTMENT. ✓

Facilities for Inspection and Repair.—Are these as per Rule YES. ✓

Wear-down gauges supplied YES ✓

Drains.—Are the arrangements to prevent accumulation of bilge-water under the machines satisfactory -



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MOTORS.—S.H.P. per Motor at full power 9000. ✓ No. of Motors One. ✓  
Single or double unit Double. ✓ Voltage per Motor 3000. ✓ Amperes per Motor 2 x 674.  
Do they comply with the requirements regarding insulation materials terminals. ✓ Yes ✓ coolers. ✓ Yes ✓ thermometers. ✓ Yes ON BEARINGS, ventilation. ✓ Yes ✓  
heating when idle. ✓ Yes 2-1/2 KW HEATERS/MOTOR. ✓ shaft currents. ✓ Yes ✓ facilities for inspection and repair. ✓ Yes ✓  
mechanical protection. ✓ Yes ✓ lubrication. ✓ Yes ✓ position in ship. -  
A.C. Motors.—Are the laminations securely clamped around the whole of the periphery. ✓ Yes ✓  
and are they insulated from one another with approved material. ✓ Yes ✓  
Is provision made for machining the collector rings. ✓ Yes ✓  
Do the Motors remain in step under all normal conditions of running. -  
D.C. Motors.—Are the brushes staggered as per Rule. -  
If the system permits overspeeding at light loads are overspeed protection devices fitted. -  
EXCITATION.—Is current for excitation taken from the ship's Auxiliary Generators. ✓ Yes ✓  
If so state voltage 220. ✓ and excitation amperes at full power 524. ✓ kilowatts for excitation 115. ✓  
State arrangements for excitation of Propulsion Generators. MAIN STARTING PERIOD DIRECT FROM 220 VOLT MAINS WITH NEGATIVE BOOSTER IN CIRCUIT UNEXCITED WITH MOTORS SYNCHRONISED NEGATIVE BOOSTER EXCITED TO GIVE NORMAL 110 VOLTS AT SLIPRINGS. ✓  
AUXILIARY SIMILAR BUT WITH MAIN FIELD RHEOSTAT IN SERIES. ✓  
and Propelling Motors. DIRECT FROM 220 VOLT MAINS. ✓  
If an alternative means of excitation is provided, state particulars. DUPLICATE BOOSTERS AND AN AUXILIARY SUPPLY FROM THREE 220 VOLTS. D.C. GENERATORS. ✓  
Do the Excitation Machines comply with the requirements regarding temperature rise at full power. ✓ Yes ✓  
and after manoeuvring as per Rule. APPROXIMATE TEST MADE — TO BE CHECKED ON SHIP. ✓  
D.C. Systems.—Are the arrangements for Motor and Generator excitation as per Rule. -  
CONTROL.—Position of Main Control Panel. -  
Do the Control Panels comply with the requirements regarding position. -  
distance from combustible material. - grouping of controls. ✓ Yes ✓  
and instruments. ✓ Yes ✓ insulating materials (state what type is used). ✓ Yes MICANITE. ✓  
spacing and shielding of live parts. ✓ Yes ✓ accessibility of parts. ✓ Yes ✓  
position of fuses. ✓ Yes ✓ proportioning of busbars. ✓ Yes ✓  
locking of screws and nuts. ✓ Yes ✓ labelling. ✓ Yes ✓ fuses for voltmeters, etc. ✓ Yes ✓  
switches and circuit breakers. ✓ Yes ✓ fusible cutouts. ✓ Yes ✓  
proportioning of levers, connecting links, etc. ✓ Yes ✓ interlocking. ✓ Yes ✓  
provision for manual operation of contactors, etc. (state method employed). NO CONTACTORS FITTED. - GEAR OPERATED MANUALLY. ✓  
earthing of instrument cases above 250 volts to earth. NONE FITTED. ✓  
provision of renewable arcing tips on switches subject to arcing. ✓ Yes ✓  
capability of withstanding shock and inclination. ✓ Yes ✓  
operation with high and low voltage. - provision for maintenance. ✓ Yes ✓  
alignment of operating shafts. ✓ Yes. "OLDHAM" COUPLING FITTED. ✓ rust proofing of parts. ✓ Yes ✓  
Overload and Short Circuit Protection.—State what means are provided. THREE PHASE INSTANTANEOUS OVERCURRENT RELAYS. ✓  
At what current or load is it set to operate. MAIN - 4000 AMPERES. ✓ AUXILIARY - 2000 AMPERES. ✓ Has it been tested by tripping. ✓  
by hand when running at full power and found satisfactory. No. TO BE CHECKED ON SHIP. ✓  
Earth Detection.—Is the main circuit provided with means for detecting earths. ✓ Yes - CIRCUIT EARTHED THROUGH HIGH IMPEDANCE TRANSFORMERS. ✓  
Are aural and visual alarms fitted. ✓ Yes ✓ Is main power interrupted by the occurrence of an earth fault. No. ✓  
If a limiting resistance is connected in the earth detecting circuit what is the ohmic value. 0. SEE BELOW. ✓  
What earth leakage current is necessary to operate the device. MAIN MINIMUM CURRENT IN PRIMARY WDG. TO OPERATE RELAYS 0.14 AMPS. AT 78.6 VOLTS. 57.5 CYCLES. ✓  
AUX. MIN. CURRENT IN PRIMARY WDG. TO OPERATE RELAYS 0.037 AMPS AT 30.2 VOLTS 22 CYCLES. BOTH CASES CORRESPOND TO A RELAY SETTING OF 0.2 AMPS. ✓  
MAIN TRANSFORMER IMPEDANCE 34600 OHMS CORRESPONDING TO 1730 VOLTS ACROSS TRANSFORMER PRIMARY AND 0.5 AMPS MAGNETISING CURRENT. ✓  
AUX. " 33000 OHMS " " 660 VOLTS " " 0.2 AMPS " " ✓  
Φ. BOTH CASES WITH TRANSFORMER SECONDARY OPEN CIRCUITED. ✓

If a switch is used to disconnect the aural signal does it automatically switch on the visual alarm. ✓ Yes ✓  
Are the excitation circuits provided with means for earth detection. ✓ Yes ON AUXILIARY D.C. PANEL. ✓  
Mechanical Protection.—Are circuits above 250 volts to earth protected as per Rule. ✓ Yes ✓  
Bridge or Deck Control.—Is bridge control provided. No ✓ If so, from how many stations. -  
Can they be operated freely without producing currents or loads in excess of the working capacity of the plant. -  
and without reference to electrical instruments. - Is an emergency control provided in the engine room. -  
and can the transfer to this control be made quickly in the engine room. -  
Can the emergency control be rendered mechanically independent of the bridge control. -  
Instruments and Gauges.—State what Instruments are provided for each Generator. COMMON WITH MAIN MOTOR) A.C. VOLTS AND AMPS. - S.H.P. -  
EXCITATION VOLTS AND AMPS - REVOLUTION COUNTER - DIRECT REVOLUTION INDICATOR - THERMO COUPLE INSTRUMENT AND PORTABLE WATTMETER. ✓  
and for each Motor. SEE ABOVE. ✓  
and, for Steam Engines, what Gauges are provided. NONE ON CUBICLE - STEAM GAUGES PROVIDED ON SEPERATE PANEL. ✓  
Is an Insulation Tester provided. -  
Discharge Protection.—Are all circuits protected as per Rule. ✓ Yes ✓  
D.C. Systems.—If the Generators are connected in series state what means are provided to prevent reversal of rotation. -  
Are the Propulsion Generators also used alternatively for other purposes. -  
If so, is provision made for overload protection, voltage adjustment, etc., as per Rule. -  
Reversing Switches.—Are any provided. ✓ Yes ✓ If so, are they interlocked as per Rule. ✓ Yes ✓  
Resistances.—Are shunt resistances for synchronous motor fields insulated as per Rule. ✓ Yes ✓  
Temperature Alarm.—Are machines with enclosed ventilating system, etc., fitted with temperature alarm. ✓ Yes ✓  
Auxiliary Power.—Are essential services protected from interruption due to overloading of non-essential circuits. ✓ Yes - TO BE ARRANGED ON AUX. D.C. PANEL. ✓  
CONDUCTORS & CABLES.—Are all essential Conductors stranded as per Rule. -  
Are the ends of Paper and Varnished Cambric Insulated Cables sealed. -  
Are the ends of all Cables having a sectional area of 0.04 sq. in. and above provided with Cable sockets. -  
Are all Cables carrying alternating current as per Rule. - Have all Cables been tested at the makers' works as per Rule. -  
SECONDARY BATTERIES.—Are Batteries used for starting Main Propulsion Engines. -  
If so, have full particulars been submitted and approved. - Have they been tested under working conditions and do they give the number of starts required by the Rules. -  
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. No ✓  
Are they stored as per Rule. -

#### ELECTRIC PROPULSION EQUIPMENT CONDUCTORS.

DESCRIPTION—MAIN GENERATORS.	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								
GENERATOR FIELDS								
MAIN MOTORS								
MOTOR FIELDS								
CONTROL CIRCUITS								
OTHER CIRCUITS:—								



All Conductors are of annealed copper, conforming to International Electrotechnical Commission Publication No. 28.

The Insulated Conductors have withstood the dielectric tests specified in the Rules.

The foregoing is a correct description,  
FOR C. A. PARSONS AND COMPANY LIMITED.

*J. Adam*  
DIRECTOR.

Electrical Engineers.

Date

13th February, 1947.

COMPASSES.—Are Single-Conductor circuits carrying continuous 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

The maximum deviation due to electric currents was found to be degrees on course in the case of the

Standard Compass and degrees on course in the case of the Steering Compass.

Builders' Signature.

Date

(1946) July 2, Aug 2, 30 Sept. 5, Nov. 12, Dec. 2 (1947) Jan. 10, 17, Feb. 5, 6, 11  
During progress of work in shops -  
Dates of Survey while building -  
During erection on board vessel -  
Total No. of visits //

Is this machinery duplicate of a previous case Yes If so, state name of vessel S.S. "BEAVERDELL"

General Remarks (State quality of workmanship, opinions as to class, &c. THE MAIN AND AUXILIARY ALTERNATORS, THE PROPULSION

MOTOR, THE CONTROL GEAR, AND THE NEGATIVE BOOSTER SETS HAVE BEEN BUILT UNDER SPECIAL SURVEY IN ACCORDANCE WITH THE APPROVED PLANS AND SECRETARY'S LETTERS. THE MATERIALS USED ARE OF GOOD QUALITY AND THE WORKMANSHIP IS SATISFACTORY. THE MACHINES AND CONTROL GEAR HAVE BEEN TESTED AT THE MAKERS WORKS AS FAR AS PRACTICABLE AND THE TEST RESULTS INDICATE THAT THE REQUIREMENTS RELATING TO TEMPERATURE RISE AND OPERATING CHARACTERISTICS WILL BE MET UNDER WORKING CONDITIONS. HIGH VOLTAGE (DIELECTRIC) AND INSULATION RESISTANCE TESTS HAVE BEEN APPLIED AND FOUND SATISFACTORY.

THE MACHINERY HAS BEEN DESPATCHED TO GLASGOW FOR INSTALLATION IN THE SHIP, AND ON COMPLETION THEREOF AND AFTER SATISFACTORY SHIP TRIALS, WILL, IN MY OPINION, BE ELIGIBLE FOR THE NOTATION + L.M.C. (WITH DATE.)

*Sa.*  
11/3/47

NEWCASTLE A/c. £154-12-0  
GLASGOW A/c. £38-13-0  
The amount of Entry Fee  
Travelling Expenses (if any) £ : :  
When applied for, 25 FEB 1947  
When received, 2/4/1947

*R. B. Storie*  
Surveyor to Lloyd's Register of Shipping.

Committee's Minute

Assigned