

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

13 NOV 1946

Date of writing Report... 1<sup>st</sup> NOVEMBER 1946 When handed in at Local Office... 5.11.46 Port of... GLASGOW

No. in Survey held at... PORT GLASGOW Date, First Survey... 4<sup>th</sup> JUNE Last Survey... 1<sup>st</sup> OCTOBER 1946

Reg. Book... 85864 on the... BEAVERLAKE (Number of Visits... 12)

Tons { Gross... 9824 Net... 5818

Built at... PORT GLASGOW By whom built... LITHGOWS LTD. Yard No... 1003 When built... 1946

Owners... CANADIAN PACIFIC RAILWAY CO Port belonging to... LONDON

Electrical Installation fitted by... SUNDERLAND FORGE & ENGINEERING CO LTD Contract No... 1003 When fitted... 1946

Is vessel fitted for carrying Petroleum in bulk... No Is vessel equipped with D.F. YES E.S.D. YES Gy.C. YES RADAR YES

Have plans been submitted and approved... YES System of Distribution... TWO WIRE Voltage of supply for Lighting... 220

Heating... 220 Power... 220 Direct or Alternating Current, Lighting... D.C. Power... D.C. If Alternating Current state periodicity... Prime Movers,

has the governing been tested and found as per Rule when full load is suddenly thrown on and off... YES Are turbine emergency governors fitted with a trip switch as per Rule... YES

Generators, are they compound wound... YES, are they level compounded under working conditions... YES

if not compound wound state distance between generators... and from switchboard... Where more than one generator is fitted are they arranged to run in parallel... YES

are shunt field regulators provided... YES Is the compound winding connected to the negative or positive pole... NEGATIVE

Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing... YES Have certificates of test for machines under 100 kw. been supplied... YES

and the results found as per rule... YES Are the lubricating arrangements and the construction of the generators as per rule... YES

Position of Generators... 400kW GENERATORS - IN ENGINE ROOM 10kW GENERATOR - BOAT DECK, STARBOARD SIDE

is the ventilation in way of generators satisfactory... YES are they clear of inflammable material... YES, if situated near unprotected combustible material state distance from same horizontally... and vertically... are the generators protected from mechanical injury and damage from water, steam and oil... YES

are the bedplates and frames earthed... YES and the prime movers and generators in metallic contact... YES

Switchboards, where are main switchboards placed... SWITCHBOARD ROOM - STARBOARD SIDE AFT END, MACHINERY SPACE

are they in accessible positions, free from inflammable gases and acid fumes... YES, are they protected from mechanical injury and damage from water, steam and oil... YES

if situated near unprotected combustible material state distance from same horizontally... and vertically... what insulation material is used for the panels... SINDANYO

if of synthetic insulating material is it an Approved Type... YES, if of semi-insulating material (slate or marble) are all conducting parts insulated therefrom as per Rule... YES

Is the frame effectually earthed... YES Is the construction as per Rule... YES

including accessibility of parts... YES, absence of fuses on the back of the board... YES, individual fuses to pilot and earth lamps, voltmeters, etc.,... YES

locking of screws and nuts... YES, labelling of apparatus and fuses... YES, fuses on the "dead" side of switches... YES

Description of Main Switchgear for each generator and arrangement of equaliser switches... 2000 AMP CIRCUIT BREAKER (NEGATIVE + EQUALISER POLE HAND OPERATED - INTERLOCKED WITH ELECTRICALLY OPERATED POSITIVE) FITTED WITH OVERLOAD, REVERSE CURRENT + PREFERENCE TRIPS 10kW GENERATORS - 50AMP D.P. SWITCH AND FUSES ALSO 50AMP CONTACTOR INTER-LOCKED WITH MAIN CIRCUIT-BREAKER

and for each outgoing circuit... CIRCUITS ABOVE 250 AMPS - D.P. CIRCUIT BREAKERS FITTED WITH OVERLOAD TRIPS

OTHER CIRCUITS - D.P. KNEE PATTERN SWITCHES WITH H.R.C. TYPE FUSES

Are compartments containing switchboards composed of fire-resisting material or lined as per Rule... YES Instruments on main switchboard... 13

ammeters... 3 voltmeters... synchronising devices. For compound machines in parallel is the ammeter connected on the pole opposite to the equaliser connection... YES

Earth Testing, state means provided... EARTH LAMPS

Switches, Circuit Breakers and Fuses, are they as per Rule... YES, are the fuses an approved type... YES, are all fuses labelled as per Rule... YES

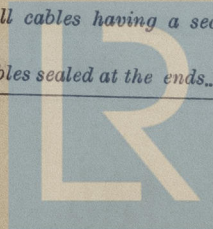
If circuit breakers are provided for the generators, at what overload current did they open when tested... FULL LOAD, are the reversed current protection devices connected on the pole opposite to the equaliser connection... YES

have they been tested under working conditions, and at what current did they operate... 10% - 15% F.L. Joint Boxes, Section Boards and Distribution Boards, is the construction and position as per Rule... YES

Cables, are they insulated and protected as per the appropriate Tables of the Rules... YES, if otherwise than as per Rule are they of an approved type... W.E.

state maximum fall of pressure between bus bars and any point under maximum load... 7 VOLTS, are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets... YES

Are paper insulated and varnished cambric insulated cables sealed at the ends... YES



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with insulating compound or waterproof insulating tape. YES. Are all the cable runs in accessible positions, not exposed to drip or accumulation of water or oil, high temperatures or risk of mechanical damage. YES, are cables laid under machines or floorplates. YES, if so, are they adequately protected. YES. Are cables in machinery spaces, galleys, laundries, etc., lead covered. YES or run in conduit. YES. State how the cables are supported and protected. MAINS: L.C. CABLES CLIPPED TO STEEL CHANNEL.

MACHINERY SPACE: L.C. CABLES CLIPPED TO STEEL TRAY.

ACCOMMODATION: L.C. CABLES CLIPPED TO WOODWORK.

Are all lead sheaths, armouring and conduits effectually bonded and earthed. YES. Refrigerated chambers, are the cables and fittings as per Rule. YES.

Are all cables passing through decks and watertight bulkheads provided with deck tubes or watertight glands. YES, where unarmoured cables pass through beams, etc., are the holes effectually pushed. YES and with what material. FIBRE. Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule. YES. Emergency Supply, state position. BATTERY SUPPLY.

Fitted in compartment in engine room and method of control. AUTOMATIC ELECTRICALLY OPERATED.

RELAY. Navigation Lamps, are they separately wired. YES controlled by separate

double pole switches. YES and fuses. YES. Are the switches and fuses in a position accessible only to the officers on watch. YES, is an

automatic indicator fitted. YES. Secondary Batteries, are they constructed and fitted as per Rule. YES, are they adequately ventilated. YES.

what is the battery capacity in ampere hours. FIFTY AMPERE HOUR AT TEN HOUR RATE.

Fittings, are all fittings on weather decks, in stokeholds and engine rooms and wherever exposed to drip or condensed moisture, weatherproof. YES. Are fittings installed where readily combustible materials or inflammable or explosive dust or gases are likely to be present. NO, if so, how are they protected.

and where are the controlling switches fitted. YES, are all fittings suitably ventilated. YES,

are all fittings and accessories constructed and installed as per Rule. YES. Searchlight Lamps, No. of YES, whether fixed or portable.

YES, are their fittings as per Rule. YES. Heating and Cooking, is the general construction as per Rule. YES,

are the frames effectually earthed. YES, are heaters in the accommodation of the convection type. YES. Motors, are all motors constructed and

installed as per Rule. YES and placed in well-ventilated compartments in which inflammable gases cannot accumulate and free from damage from water,

steam and oil. YES, if situated near unprotected combustible material state minimum distance from same horizontally. YES and vertically. YES. Are

motors coupled to oil fuel transfer and unit pressure pumps capable of being stopped from a position accessible in the event of fire in the pump compartment. YES.

Have motors of 100 BHP and over been inspected by the Surveyors during manufacture and testing. YES. Have certificates of test for motors under

100 BHP intended for essential services been supplied and the results found as per Rule. YES. Control Gear and Resistances, are they constructed and

fitted as per Rule. YES. Lightning Conductors, where required are they fitted as per Rule. YES. Ships carrying Oil having a Flash Point

less than 150° F. Have all the special requirements of the Rules for such ships been complied with. YES, are all fuses of the cartridge type. YES,

are they of an approved type. YES. Are the fittings for pump rooms, 'tween deck spaces, etc., in accordance with the special requirements for such

ships. YES. Are the cables lead covered as per Rule. YES. Spare Gear, if the vessel is for open sea service have spares been provided as per

Rule. YES, are they suitably stored in dry situations. YES. Insulation Tests, has the insulation resistance of all circuits and apparatus been tested

and found satisfactory. YES.

#### PARTICULARS OF GENERATING PLANT.

DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN	3	400	225	1780	800	DIESEL ENGINE	OIL	ABOVE 150°F
	1	10	220	455	1000	DIESEL ENGINE	OIL	ABOVE 150°F
EMERGENCY								
ROTARY TRANSFORMER								

#### GENERATOR CABLES.

DESCRIPTION.	KILOWATTS.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus return feet).	INSULATED WITH.	HOW PROTECTED.
		No. in Parallel Per Pole.	Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm.	In the Circuit.	Rule.			
MAIN GENERATOR	400	2	127/103	1780	1864	102	V.C.	L.C.
" " EQUALISER		1	127/103		932	51	V.C.	L.C.
AUXILIARY GENERATOR	10	1	19/064	455	135	300	V.C.	L.C.
EMERGENCY GENERATOR								
ROTARY TRANSFORMER: MOTOR								
" " GENERATOR								

#### MAIN DISTRIBUTION CABLES.

DESCRIPTION.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus return feet).	INSULATED WITH.	HOW PROTECTED.
	No. in Parallel Per Pole.	Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm.	In the Circuit.	Rule.			
AUX. SWITCHBOARDS AND SECTION BOARDS ...							
WIRELESS, NAVIGATION & GYRO SECTION	1	19/083	106	191	404	V.C.	L.C.
MIDSHIPS AFT LIGHTING SECTION	1	19/064	33.6	135	134	V.C.	L.C.
MIDSHIPS FORWARD LIGHTING SECTION	1	19/064	34.5	135	156	V.C.	L.C.
GALLEY & PANTRY SECTION	1	19/064	119	135	135	V.C.	L.C.
ENGINE-ROOM AUX. STD. AFT	1	19/064	169	135	74	V.C.	L.C.
ENGINE-ROOM AUX. PORT.	1	19/064	86	135	212	V.C.	L.C.
EXTRACTION PUMP SECTION	1	19/064	111	135	280	V.C.	L.C.
BOILER-ROOM AUX. SECTION	1	19/064	86	135	212	V.C.	L.C.
ENGINE-ROOM LIGHTING SECTION	1	19/064	91	135	90	V.C.	L.C.
REFRIGERATOR PUMP SECTION	1	37/083	248	216	216	V.C.	L.C.
FORWARD RING MAIN (WINCHES)	2	37/072	418	422	842	V.C.	L.C.
MIDSHIP RING MAIN (WINCHES)	2	19/083	300	382	368	V.C.	L.C.
AFT RING MAIN (WINCHES)	2	19/083	300	382	384	V.C.	L.C.

#### LIGHTING AND HEATING, ETC., CABLES.

WIRELESS	1	7/064	35	75	46	V.C.	L.C.
NAVIGATION LIGHTS	1	7/064	17	42	100	V.C.	L.C.
LIGHTING AND HEATING							
PANTRY D.B.	1	7/064	72	75	96	V.C.	L.C.
HOSPITAL D.B.	1	7/064	19	42	188	V.C.	L.C.
AFT CARGO D.B.	1	19/064	22.4	135	408	V.C.	L.C.
FORWARD CARGO D.B.	1	19/064	75	135	368	V.C.	L.C.
REFRIG. MACHINERY SPACE L.T. D.B.	1	7/029	4	15	278	V.C.	L.C.
PROPULSION EQUIPMENT HEATER D.B.	1	7/064	80	42	60	V.C.	L.C.
REFRIG. COOLER FANS FORWARD	1	19/083	99	191	202	V.C.	L.C.
REFRIG. COOLER FANS AFT N°1	1	19/064	101	135	24	V.C.	L.C.
REFRIG. COOLER FANS AFT N°2	1	19/064	39	135	388	V.C.	L.C.
GYRO COMPASS	1	7/064	10	42	68	V.C.	L.C.
RADAR	1	7/064	26	75	100	V.C.	L.C.

#### MOTOR CABLES.

ALL IMPORTANT MOTORS TO BE ENUMERATED.	No.	B.H.P.						
WINDLASS	1	53	1	37/072	203	246	196	V.C. L.C.
STEERING GEAR	2	35	1	19/064	132	135	680	V.C. L.C.
MAIN CIRCULATING PUMPS	2	55	1	37/072	212	246	204	V.C. L.C.
FORCED DRAUGHT FANS	1	44	1	19/083	166	191	232	V.C. L.C.
INDUCED DRAUGHT FANS	1	44	1	19/083	166	191	232	V.C. L.C.
GENERAL SERVICE PUMPS	3	36	1	19/083	146	191	120	V.C. L.C.
FORCED LUB. OIL PUMPS	2	18	1	19/064	70	135	248	V.C. L.C.
OIL FUEL TRANSFER PUMP	1	16	1	7/064	63	75	148	V.C. L.C.
EXTRACTION PUMPS	2	13.5	1	7/064	54	75	30	V.C. L.C.
AIR COMPRESSOR	1	11	1	7/064	44	75	24	V.C. L.C.
FRESH WATER PUMP	1	10	1	7/064	40	75	104	V.C. L.C.
TURNING GEAR	1	10	1	7/064	40	75	132	V.C. L.C.
ENGINE-ROOM VENT FAN	1	5.75	1	7/064	24	42	100	V.C. L.C.
GENERATOR COOLING PUMP	1	4.25	1	7/064	17	42	92	V.C. L.C.
AUX. FEED PUMPS	2	4	1	7/064	17	42	150	V.C. L.C.
OIL BURNING GEAR	2	3.25	1	7/029	14	15	68	V.C. L.C.
BOILER-ROOM VENT FAN	1	3.25	1	7/064	14	42	78	V.C. L.C.
FRAMATEL TURNING MOTOR	1	2.5	1	7/029	11	15	160	V.C. L.C.
AUX. BOILER F.D. FAN	1	2	1	7/029	9	15	150	V.C. L.C.
PROPULSION MOTOR VENT FAN	1	30	1	19/064	114	135	234	V.C. L.C.
REFRIG. COMPRESSORS	2	140	2	37/083	528	592	127	V.C. L.C.
BRINE PUMPS	4	9	1	7/064	36	42	160	V.C. L.C.
REFRIG. CIRCULATING PUMP	1	12	1	7/064	48	75	152	V.C. L.C.
REFRIG. COOLER FANS	7	2.25	1	7/064	12.3	42	84	V.C. L.C.
REFRIG. COOLER FANS	4	2.1	1	7/064	9.5	42	120	V.C. L.C.
REFRIG. COOLER FANS	4	1.8	1	7/064	8.1	42	86	V.C. L.C.
REFRIG. COOLER FANS	4	1.6	1	7/064	7.2	42	100	V.C. L.C.
WINCHES	19	35	1	19/064	140	151	180	V.C. L.C.
WINCHES	2	4.2	1	19/083	178	225	96	V.C. L.C.

The Electrical Equipment is installed in accordance with the approved plans and the requirements of the Rules.

All Insulated Conductors are guaranteed to have been tested at the maker's works as specified in the Rules.

The foregoing is a correct description.

P.Pro.

THE SUNDERLAND FORGE & ENGINEERING CO. LTD.

Electrical Engineers.

Date 4/11/46

#### COMPASSES.

Minimum distance between electric generators or motors and standard compass

TWENTY-THREE FEET

Minimum distance between electric generators or motors and steering compass

TWENTY-ONE FEET

The nearest cables to the compasses are as follows:—

A cable carrying 17 Ampères NINE feet from standard compass SEVEN feet from steering compass.

A cable carrying 137 Ampères LED INTO feet from standard compass LED INTO feet from steering compass.

A cable carrying Ampères feet from standard compass feet from steering compass.

Have the compasses been adjusted with and without the electric installation at work at full power YES

Has the effect of switching on and off circuits, motors and other electro-magnetic apparatus within the vicinity of the compasses been noted YES

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

standard compass, and Nil degrees on Any course in the case of the steering compass.

LITHGOWS LIMITED:

A. H. White Secretary

Builder's Signature.

Date 4/11/46

Is this installation a duplicate of a previous case YES If so, state name of vessel BEAVERGLEN

Plans. Are approved plans forwarded herewith No If not, state date of approval 28/4/45

Certificates. Are certificates of test for motors engaged on essential services and generators forwarded herewith YES

General Remarks (State quality of workmanship, whether insulation tests, etc., have been made, opinions as to class, etc.)

The electrical equipment of this vessel has been fitted on board under special survey tested under working conditions and found satisfactory. The materials and workmanship are good.

Total Capacity of Generators 1210 Kilowatts.

Power from Aux. Generators for Excitation of Propulsion Machinery 115 KWS.

The amount of Fee (109.5kms) £ 72 : 7/6 When applied for, 10-9-19  
GLASGOW  
LONDON  
SUNDERLAND  
Travelling Expenses (if any) £ 1 : 5/8 When received, 10-9-19  
(LONDON)  
GLASGOW EXPENSES £ 2 : 3/6

Committee's Minute

Assigned

Surveyor to Lloyd's Register of Shipping.



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Foundation