

Rpt. 13.

No. 106781

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office 26 FEB 6

Date of writing Report 19 When handed in at Local Office 15 FEB 1936 Port of LIVERPOOL
 No. in Survey held at BIRKENHEAD Date, First Survey 4/11/35 Last Survey 6/2/1936
 Reg. Book. 37772 on the T.S.M.V. "DUNEDIN STAR" Tons { Gross 11168 Net 6855
 Built at BIRKENHEAD By whom built CAMMELL LAIRD & CO. LTD. Yard No. 1009 When built 1936
 Owners UNION COAL STORAGE CO. LTD. Port belonging to LONDON
 Electric Light Installation fitted by THE SPENDERLAND FORGE & ENG. CO. LTD. Contract No. 1009 When fitted 1936
 Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution Double Wire
 Pressure of supply for Lighting 220 volts, Heating 220 volts, Power 220 volts.
 Direct or Alternating Current, Lighting Direct Power Direct
 If alternating current system, state frequency of periods per second ✓
 Has the Automatic Governor been tested and found efficient when the whole load is suddenly thrown on or off Yes
 Generators, do they comply with the requirements regarding temperature rise Yes, are they compound wound Yes
 are they over compounded 5 per cent. Yes, if not compound wound state distance between each generator ✓
 Where more than one generator is fitted are they arranged to run in parallel Yes, is an adjustable regulating resistance fitted in series with each shunt field Yes Have certificates of test results for machines under 100 kw. been submitted and approved ✓
 Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing Yes
 Are all terminals accessible, clearly marked, and furnished with sockets Yes, are they so spaced or shielded that they cannot be accidentally earthed, short circuited, or touched Yes Are the lubricating arrangements of the generators as per Rule Yes
 Position of Generators Engine Room 7 Port & Starboard is the ventilation in way of the generators satisfactory Yes are they clear of all inflammable material Yes if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the generators ✓ and ✓
 are the generators protected from mechanical injury and damage from water, steam or oil Yes, are their axes of rotation fore and aft Yes
 Earthing, are the bedplates and frames of the generating plant efficiently earthed Yes are the prime movers and their respective generators in metallic contact Yes Main Switch Boards, where placed At the end of Engine Room
 If the generators and main switchboard are not placed in the same compartment, is each generator provided with a fuse on each insulated pole as near as possible to the terminals of the generator, additional to that provided on the main switchboard ✓
 Switchboards, are they placed in accessible positions, free from inflammable gases and acid fumes Yes, are they protected from mechanical injury and damage from water, steam or oil Yes, if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the switchboards ✓ and ✓, are they constructed wholly of durable, non-ignitable non-absorbent materials Yes, is all insulation of high dielectric strength and of permanently high insulation resistance Yes
 is it of an approved type Yes, if semi-insulating material is used, are all conducting parts insulated from the slab with mica or micanite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework Yes, is the non-hygroscopic insulating material of an approved type Yes, and is the frame effectively earthed Yes Are the fittings as per Rule regarding: — spacing or shielding of live parts Yes, accessibility of all parts Yes, absence of fuses on back of board Yes, temperature rise of omnibus bars Yes, individual fuses to voltmeter, pilot or earth lamp Yes, are moving parts of switches alive in the "off" position Yes, are all screws and nuts securing connections effectively locked Yes are any fuses fitted on the live side of switches Yes
 Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches For GENs: T.P., O.L., Reverse Current Trip C.B.s. For OUTGOING CIRCUITS: 400V 200A 12 DP, O.L., C.B.s. For CIRCUITS BELOW 200 AMP.
 D.P. Quick Break Knife switches & D.P. fuses.
 Are turbine driven generators fitted with emergency trip switch as per rule Yes Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material Yes Instruments on main switchboard 1 - TOTAL LOAD } ammeters 1 - LINE } 10 - OUTGOING }
 voltmeters ✓ synchronising device for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connection
 Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system Earth lamps Switches, Circuit Breakers and Fusible Cut-outs, have the reversed
 do these comply with the requirements of the Rules Yes are the fusible cutouts of an approved type G.E.C.

current protection devices been tested under working conditions *Yes* Joint Boxes, Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule *Yes*

Cables: Single, twin, concentric, or multicore *Single & Twin* are the cables insulated and protected as per Tables IV, V, X or XI of the Rules *Yes*

If the cables are insulated otherwise than as per Rule, are they of an approved type *Yes* Fail of Pressure, state maximum between bus bars and any point of the installation under maximum load *11.8 volts Amper. 8.6 volts lighting* Cable Sockets, are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets *Yes*

Paper Insulated and Varnished Cambric Insulated Cables, If conductors are paper or varnished cambric insulated, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound *Yes*, or waterproof insulating tape *Yes* Cable Runs, are the cables fixed as far as possible in accessible positions not exposed to drip or accumulation of water or oil, or to high temperature from boilers, steam pipes, uptakes or other hot objects, or to avoidable risk of mechanical damage *Yes* Are cables in machinery spaces, galleys, lavatories, bathrooms and lavatories lead covered or run in conduit *Yes*

Support and Protection of Cables, state how the cables are supported and protected *Machine Frames & main Aft - LC-S clipped to steel trays. Along Dr. For - In trough filled with sea lamp. On R. - H.R. Clipped to wood grates.*

If cables are run in wood casings, are the casings and caps secured by screws *Yes*, are the cap screws of brass *Yes*, are the cables run in separate grooves *Yes* If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VIII *Yes*

Refrigerated Chambers, are the cables and fittings in accordance with the special requirements *Yes*

Joints in Cables, state if any, and how made, insulated, and protected *None made*

Watertight Glands and Deck Tubes, are all cables passing through decks and watertight bulkheads provided with deck tubes or watertight glands *Yes* Bushes in Beams and Non-watertight Partitions, where unarmoured cables pass through beams and non-watertight partitions, are the holes efficiently bushed *Yes* state the material of which the bushes are made *Lead or Fibre*

Earthing Connections, state what earthing connections are fitted and their respective sectional areas *Yes* are their connections made as per Rule *Yes*

Alternative Lighting, are the groups of lights in the propelling machinery space arranged as per Rule *Yes* Emergency Supply, state position and method of control of the emergency supply and how the generator is driven *Yes*

Navigation Lamps, are these separately wired *Yes*, controlled by separate switch and separate fuses *Yes*, are the fuses double pole *Yes* are the switches and fuses grouped in a position accessible only to the officers on watch *Yes* has each navigation lamp an automatic indicator as per Rule *Yes* Secondary Batteries, are they constructed and fitted as per Rule *Yes*

Fittings, are all fittings on weather decks, in stokeholds and engine rooms and wherever exposed to drip or condensed moisture, watertight *Yes* are any fittings placed in spaces in which goods are liable to be stacked in close proximity to them; if so, how are they protected *Yes* are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected *Yes* how are the cables led *Yes*

where are the controlling switches situated *Yes* are all fittings suitably ventilated *Yes*, are all switches and lampholders constructed wholly of non-ignitable, non-absorbent materials *Yes*

Heating and Cooking Appliances, are they constructed and fitted as per Rule *Yes*, are air heaters constructed and fitted as per Rule *Yes*

Searchlight Lamps, No. of *Yes*, whether fixed or portable *Yes*, are their fittings as per Rule *Yes*

Arc Lamps, other than searchlight lamps, No. of *Yes*, are their live parts insulated from the frame or case *Yes*, are their fittings as per Rule *Yes*

Motors, are their working parts readily accessible *Yes*, are the coils self-contained and readily removable for replacement *Yes* are the brushes, brush holders, terminals and lubricating arrangements as per Rule *Yes* are the motors placed in well-ventilated compartments in which inflammable gases cannot accumulate and clear of all inflammable material *Yes* are they protected from mechanical injury and damage from water, steam or oil *Yes* are their axes of rotation fore and aft *Yes* if situated near unprotected woodwork or other combustible material, are the motors of the totally enclosed, pipe ventilated, forced draught, drip or flame proof type *Drip Proof for hold fans.* if not of this type, state distance of the combustible material horizontally or vertically above the motors *Yes* and *Yes*

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing *Yes* Control Gear and Resistances, are the generator field and motor speed regulators, starters and controllers constructed and fitted as per Rule *Yes* Lightning Conductors, where lightning conductors are required, are these fitted as per Rule *Yes* Ships carrying Oil having a Flash Point less than 150° F. Have the special requirements of the Rules been complied with regarding switches, joint boxes, section and distribution boards, protection of cables, method of distribution, lead of cables, lights and fittings *Yes* are all fuses of the fitted cartridge type *Yes* are they of an approved type *Yes*

If portable lamps for use in dangerous spaces are supplied, are they of a self-contained, battery-fed type approved by the Home Office *Yes*

Spare Gear, if the vessel is for open sea service have spares been supplied as per Rule *Yes*

Rpt. 9a.

Port of *LIVERPOOL*

Continuation of Report No. *10677*

dated *15.2.36*

on the

T.S. MV. *DUNEDIN STAR*

DESCRIPTION	No of Motors	CONDUCTORS No PER POLE	TOTAL AREA PER POLE SQ IN	COMPOSITION OR STAND No	DIA.	IN CIRCUM	TOTAL MAX CURRENT RULE	APPROX LENGTH LEAD VENTILATION FEET.	INSULATED WITH	HOW PROTECTED
SERVICE COOKING MAP 'B'	-	1	.3	37	.103	316	346	540	V.C.	L.C.B.
do do 'A'	-	1	.03	19	.044	49	78	300	do	do
DR. AUX. MAP 'E'	-	1	.2	37	.083	250	266	570	do	do
do 'D'	-	1	.25	37	.093	300	309	400	do	do
do 'C'	-	1	.4	61	.093	384	417	700	do	do
do 'B'	-	1	.15	37	.072	200	222	540	do	do
GYRO COMPASS.	-	1	.01	7	.044	20	31	540	V.I.R.	do
REFRIG MACH. M.B.D.F.	-	2	1.7	127	.093	1282	1466	500	V.C.	do
ENG. RM. CRANE.	2	1	.007	7	.036	20	24	150	V.I.R.	do
do DRILL	1	1	.008	3	.036	7	12	270	do	do
FAN S.F. PANES N.B.W.	-	1	.2	37	.083	249	266	460	V.C.	do
do No 20	-	1	.06	19	.064	107.5	122	146	do	do
do No 23	-	1	.2	37	.083	242.5	266	450	do	do
BRINE PUMPS.	5	1	.03	19	.044	68	78	243	do	do
do	1	1	.0045	7	.029	14	18.2	243	V.I.R.	do
do	1	1	.0045	7	.029	15	18.2	186	do	do
REFRIG S.W. CIRC. PUMP.	2	1	.03	19	.044	68	78	176	V.C.	do
HALL MARK.	2	1	.01	7	.044	28	31	80	V.I.R.	do
REFRIG F.W. PUMP.	1	1	.0045	7	.029	14	18.2	234	do	do
No 3 HOLD FANS.	2	1	.0225	7	.064	45	68	135	V.C.	do
FANS.	1	1	.045	7	.052	32.5	37	108	H.R.	-
do	3	1	.0225	7	.064	45	46	215	do	-
do	3	1	.002	3	.029	5	7.8	135	do	-
do	1	1	.01	7	.044	14	31	125	do	-
do	1	1	.002	3	.029	.5	7.8	54	do	-
do	6	1	.003	3	.036	8.75	12	270	do	-
do	2	1	.0045	7	.029	14	18.2	150	do	-
do	1	1	.003	3	.036	10	12	245	do	-
do	4	1	.003	3	.036	8.75	12	135	do	-
do	4	1	.002	3	.029	5	7.8	245	do	-
do	1	1	.002	3	.029	3.75	7.8	270	do	-
do	6	1	.002	3	.029	2.5	7.8	270	do	-
do	1	1	.002	3	.029	.5	7.8	270	do	-
do	1	1	.0225	7	.064	45	46	135	do	-
do	1	1	.0145	7	.052	32.5	37	135	do	-
do	2	1	.007	7	.036	23.5	24	135	do	-
do	2	1	.007	7	.036	20.5	24	130	do	-
do	1	1	.01	7	.044	14	31	135	do	-
do	1	1	.003	3	.036	7.5	12	850	do	-

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	340	220	1540	375	Single Diesel Engines.		
AUXILIARY ...								
EMERGENCY ...								
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT. AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
	No. per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	Circuit.	Rule.			
MAIN GENERATOR	3	18	91	.093	1540	1683	137	V.C.	L.C.B.
EQUALISER CONNECTIONS ...	2	8	61	.093	-	834	137	do	do
AUXILIARY GENERATOR ...									
EMERGENCY GENERATOR ...									
ROTARY TRANSFORMER { MOTOR GENERATOR...									
ENGINE ROOM... ..No.1	1	.01	7	.044	25	31	340	V.I.R.	L.C.B.
Boiler RoomNo.2	1	.01	7	.044	25	31	340	do	do
AUXILIARY SWITCHBOARDS ...									
FAN & HEATERS M.B. 'A'	1	.06	19	.064	110	122	540	V.C.	L.C.B.
do 'B'	1	.06	19	.064	99	122	560	do	do
ACCOMMODATION									
LIGHTING M.B. 'A'	1	.0225	7	.064	46	68	520	V.C.	L.C.B.
do 'B'	1	.0225	7	.064	37	68	560	do	do
LIGHTING NAVIGY M.B. 2	1	.0045	7	.029	8	18.2	190	V.I.R.	do
LOW POWER SW. B.D.	1	.0045	7	.029	6	18.2	162	do	do
WIRELESS	1	.01	7	.044	(20)	31	780	do	do
SEARCHLIGHT									
MASTHEAD LIGHT	1	.002	3	.029	18	78	410	V.I.R.	L.C.B.
SIDE LIGHTS	1	.002	3	.029	18	78	180	do	do
COMPASS LIGHTS	1	.002	3	.029	1	78	25	do	do
POOP LIGHTS	1	.002	3	.029	18	78	890	do	do
CARGO LIGHTS	1	.0225	7	.064	20	68	540	V.C.	do
ARC LAMPS	1	.0225	7	.064	20	68	1080	V.C.	do
HEATERS									

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT. AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
		No. Per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rule.			
BALLAST PUMP ...	1	1	.04	19	.052	93	94	145	V.C.	L.C.B.
MAIN BILGE LINE PUMPS ...	1	1	.0225	7	.064	49	68	270	do	do
GENERAL SERVICE PUMP ...	1	1	.04	19	.052	93	94	127	do	do
EMERGENCY BILGE PUMP ...										
SANITARY PUMP ...	1	1	.04	19	.052	93	94	127	do	do
CIRC. SEA WATER PUMPS ...	3	1	.1	19	.083	162	172	284	do	do
CIRC. FRESH WATER PUMPS ...	2	1	.1	19	.083	170	172	284	do	do
AIR COMPRESSOR ...	2	1	.4	61	.093	395	417	240	do	do
Domestic FRESH WATER PUMP ...	1	1	.01	7	.044	23.5	31	310	V.I.R.	do
ENGINE TURNING GEAR ...	2	1	.0225	7	.064	58.5	68	300	V.C.	do
Aux. F.O.S.W. Life Pump	1	1	.04	19	.052	97	94	180	do	do
ENGINE REVERSING GEAR ...	3	1	.04	19	.052	97	94	57	do	do
LUBRICATING OIL PUMPS ...	2	1	.0225	7	.064	56	64	140	do	do
OIL FUEL TRANSFER PUMP ...	1	1	.2	37	.083	300	338	405	do	do
WINDLASS ...	2	1	.1	19	.083	200	203	144	do	do
WINCHES, FORWARD ...	5	1	.075	19	.072	150	162	211	do	do
do do	6	1	.075	19	.072	150	162	246	do	do
WINCHES, AFT ...	5	1	.075	19	.072	150	162	111	do	do
do do	4	1	.075	19	.072	150	162	208	do	do
do do	1	1	.1	19	.083	200	203	450	do	do
STEERING GEAR WARPING WINCH	1	1	.15	37	.072	270	222	540	do	do
STEERING GEAR MOTOR GENERATOR 1.	1	1	.15	37	.072	270	222	580	do	do
GEN. (b) MAIN MOTOR ...	2	1	.003	3	.036	12	12	270	V.I.R.	do
WORKSHOP MOTOR ...	5	1	.0045	7	.029	14	18.2	220	do	do
VENTILATING FANS ...	-	1	.0225	7	.064	50	68	350	V.C.	do
MOTOR RM. SUB. D. ESSENTIAL	-	1	.04	19	.052	70	94	515	do	do
do NON ESSENTIAL	2	1	.003	3	.036	12	12	270	V.I.R.	do
OIL PURIFIERS ...	2	1	.003	3	.036	8	12	270	do	do
do	1	1	.003	3	.036	10	12	250	do	do
F.D. FANS ...	1	1	.003	3	.036	10	12	100	do	do
FUEL OIL PUMP ...	1	1	.003	3	.036	5	12	320	do	do
AUX. ENG. F.V. PUMP ...										

All Conductors are of annealed copper conforming to British Standard Specification No. 7 (or International Electro-technical Commission Publication No. 28).

The Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules.

The foregoing is a correct description.

Williamson

Electrical Engineers.



P. PRO THE SUNDERLAND FORGE & ENGINEERING CO. LTD.

COMPASSES.

Distance between electric generators or motors and standard compass 45 ft approx

Distance between electric generators or motors and steering compass 37 ft approx

The nearest cables to the compasses are as follows:—

A cable carrying 1 Ampères 8 feet from standard compass 8 feet from steering compass.

A cable carrying 1 Ampères 8 feet from standard compass 8 feet from steering compass.

A cable carrying 8 Ampères 7 feet from standard compass 5 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 10 W degrees on all courses S.E. by S to S.W. by S course in the case of the standard compass, and 10 E degrees on all courses N.E. by N - N.E. by E course in the case of the steering compass.

CAMMELL LAIRD & CO. LIMITED

W. Cammell

Builder's Signature.

Date 13 FEB 1936

SECRETARY

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

General Remarks (State quality of workmanship, opinions as to class, etc. This installation has been fitted on)

board under special survey and in accordance with the approved plans and has been tried under full working conditions and found to be in order. The materials and workmanship have been found to be good & sound.

Noted

Yours

2.3.36

Total Capacity of Generators 1020 Kilowatts.

The amount of Fee ... £ 70 : 10 : 7

Labour etc.

Travelling Expenses (if any) £ 3 : 18 : 0

Labour etc.

When applied for,

22 FEB 1936

When received,

18-3 1936

R. C. Clayton

Surveyor to Lloyd's Register of Shipping.

Committee's Minute LIVERPOOL 25 FEB 1936

Assigned Electric Light

The Surveyors are requested not to write on or below the space for Committee's Minute



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