-1 OCT 1934

Rpt. 13.

No. 11372

REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

-1 OCT 1934

Received at London Office

Date of writing Report 28/9/1934 When handed in at Local Office 28/9/1934 Port of Belfast

No. in Reg. Book. Survey held at Belfast Date, First Survey 30th Feb. Last Survey 19th Sept 1934

(Number of Visits 13)

75271 on the T.S.M.V. DURHAM Tons Gross 10892·66 Net 6260·72

Built at BELFAST By whom built WORKMAN CLARK & Co (1928) LTD Yard No. 533 When built 1934

Owners NEW ZEALAND SHIPPING Co Port belonging to

Electric Light Installation fitted by SUNDERLAND FORGE & ENG. Co. LTD Contract No. 533 When fitted 1934

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 rating* 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

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 MAIN ENGINE ROOM,

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* MAIN 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 SAME COMPARTMENT

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, *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,

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, *proportion of omnibus bars* YES, *individual fuses to voltmeter, pilot or earth lamp* YES, *connections of switches* YES.

Main Switchgear, *description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches* TRIPLE POLE OVERLOAD & REVERSE CURRENT CIRCUIT BKRS WITH TIME LAG & PREFERENCE TRIPPING GEAR FOR EACH GENERATOR (3RD POLE ACTS AS EQUALISER SWITCH). DOUBLE POLE OVERLOAD CIRCUIT BREAKER OR DOUBLE POLE SWITCH & FUSES FOR EACH OUTGOING CIRCUIT.

Instruments *on main switchboard* 16 *ammeters:* 3 *voltmeters* — *synchronising device for paralleling purposes.*

Earth Testing, *state what means are provided at the main switchboard for indicating the state of the insulation of the system*

SWITCH FUSE & LAMP ON EACH POLE CONNECTED TO EARTH

Switches, Circuit Breakers and Fusible Cut-outs, *do these comply with the requirements of the Rules* 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 *or* V *of the Rules* YES

Fall of Pressure, *state maximum between bus bars and any point of the installation under maximum load* 6 VOLTS

Cable Sockets and other connections, *are the ends of all cables having a sectional area of* 0·04 *square inch and above provided with soldering sockets* YES

Paper Insulated Cables. *If cables are paper covered, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound* —

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

Support and Protection of Cables, *state how the cables are supported and protected* LEAD COVERED & BRAIDED CABLE IN ACCOM. SUPPORTED BY BRASS CLIPS. LEAD COVERED ARMOURED & BRAIDED IN ENGINE ROOM & OPEN DECKS SUPPORTED BY G.I. CLIPS

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

Refrigerated Chambers, *if lights are fitted, are the cables and fittings in accordance with the special requirements* —

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

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

Earthing Connections, *state what earthing connections are fitted and their respective sectional areas* —

, are their connections made as per Rule .

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*

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* —

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected —

, how are the cables led

where are the controlling switches situated

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

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

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* YES, *if not of this type, state distance of the combustible material horizontally or vertically above the motors* — *and* —

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*

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*

If portable lamps for use in dangerous spaces are supplied, are they of a type approved by the Home Office

-1 OCT 1924

PARTICULARS OF GENERATING PLANT.

DESCRIPTION OF GENERATOR.	No. of	RATED AT Kilowatts.	Volts.	Amperes.	Revs. per Min.	DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE. Fuel Used.	Flash Point of Fuel.
MAIN	3	300	220	1360	340	DIESEL ENGINE	British	Above 150
AUXILIARY ...	1	200	220	1000	425	STEAM ENGINE	Mex.	
EMERGENCY ...								
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS. No. per Pole.	CONDUCTORS. Total Effective Area per Pole Sq. Ins.	COMPOSITION OF STRAND. No.	COMPOSITION OF STRAND. Diameter.	TOTAL MAXIMUM CURRENT. AMPERES. In Circuit.	TOTAL MAXIMUM CURRENT. AMPERES. Rule.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
MAIN GENERATOR	2	1·750	127	093	1360	1466	150	VARNISH CAMBRIC	LC&B
EQUALISER CONNECTIONS ...	1	·850	127	093		733	75	do.	do
AUXILIARY GENERATOR	2	1·2	91	093	1000	1122	146	do	do.
EMERGENCY GENERATOR ...									
ROTARY TRANSFORMER { MOTOR ... GENERATOR...									
ENGINE ROOM...	1	·0225	7	064	20	46	160	V.I.R	LCAB
~~BOILER ROOM~~ ENGINE RM.	1	·0225	7	064	25	46	195	do	do
AUXILIARY SWITCHBOARDS ...									
CARGO FORD.	1	·0225	7	·064	31	46	352	do	LCB
HEATERS MIDSHIP	1	·12	37	·064	181·7	189	146	VARNISH CAMBRIC	do
CALORIFIERS	1	·04	19	·052	81·7	94	766	do	do
GALLEY & PANTRY	2	·40	37	083	518	532	310	do	do
SHORE CONNECTION	1	·30	37	103	346	346	218	do	do
ACCOMMODATION	1	·075	19	072	100	141	122	do	do
ACCOMMODATION BATTERY	1	·04	19	052	41	94	150	do	do
BOAT LTS.	1	·003	3	036	4·4	12	576	V.I.R.	do
BATTERY SUPPLY	1	·30	37	103		240	60	C.T.S.	
ENGINE ROOM LIGHTING	1	·003	3	036	6·0	12	195	V.I.R	LCAB
WIRELESS	1	·007	7	036		24	440	V.I.R	LCB
SEARCHLIGHT									
MASTHEAD LIGHT	1	·002	3	029	·18	7·8	750	V.I.R.	do
SIDE LIGHTS	1	·002	3	029	·18	7·8	150	do	do
COMPASS LIGHTS	1	·002	3	029	·07	7·8	40	do	do
~~DECK LIGHTS~~ NAVIGATION...	1	·0045	7	029	8	18·2	576	do.	do
CARGO LIGHTS AFT	1	·0225	7	064	31	46	202	do	do
ARC LAMPS									
HEATERS ... ..AFT	1	·04	19	052	65·9	94	122	VARNISH CAMBRIC	do

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS. No. Per Pole.	CONDUCTORS. Total Effective Area per Pole Sq. Ins.	COMPOSITION OF STRAND. No.	COMPOSITION OF STRAND. Diameter.	TOTAL MAXIMUM CURRENT. AMPERES. In Circuit.	TOTAL MAXIMUM CURRENT. AMPERES. Rule.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
BALLAST PUMP	1	1	·04	19	052	72	94	152	V.CAMBRIC	LCAB
MAIN BILGE LINE PUMPS ...	2	1	·04	19	052	95·5	94	156	do	do
GENERAL SERVICE PUMP ...	1	1	·04	19	052	72	94	114	do	do
REFRIG. COMPRESSOR ...	3	2	·50	37	093	600	618	80	do	do
SANITARY PUMP	1	1	·04	19	052	72	94	126	do	do
CIRC. SEA WATER PUMPS ...	3	1	·20	37	083	230	266	192	do	do
CIRC. FRESH WATER PUMPS...	3	1	·15	37	072	216	222	196	do.	do
AIR COMPRESSOR	2	2	·12	37	064	373	378	210	do.	do
FRESH WATER PUMP	2	1	·007	7	036	23	24	180	V.I.R	do
ENGINE TURNING GEAR... ...	2	1	·04	19	052	62	94	84	V.CAMBRIC	do
REFRIG. COOLER FANS	4	1	·04	19	052	63	94	526	do	do
LUBRICATING OIL PUMPS ...	3	1	·06	19	064	100	122	248	do	do
OIL FUEL TRANSFER PUMP ...	2	1	·04	19	052	53	94	204	do	do
WINDLASS	1	2	·60	37	103	600	692	95	do	do
WINCHES, FORWARD	10	1	·10	19	083	122·5	172	65	do	LCB
REFRIG CIRC. PUMP	2	1	·04	19	052	37	94	186	do	LCAB
WINCHES, AFT	10	1	·10	19	083	122·5	172	65	do	LCB
REFRIG BRINE PUMP	4	1	·04	19	052	67	94	136	do	LCAB
REFRIG BRINE PUMP	1	1	·0045	7	029	16	18·2	88	V.I.R	do
STEERING GEAR										
(a) MOTOR GENERATOR...	2	1	·12	37	064	192	189(1Hour)	490	V.CAMBRIC	LCAB
(b) MAIN MOTOR	1	1	·007	7	036	23	24	158	V.I.R.	do
WORKSHOP MOTOR	5	1	·01	7	044	23·5	31	500	V.I.R	do
VENTILATING FANS	2	1	·0225	7	064	44	46	115	do	LCB
BOAT WINCHES	3	1	·01	7	044	9·3	31	122	do	LCAB
CRANE	4	1	·0045	7	029	13·5	18·2	75	do	IN PIPE
OIL SEPARATORS	1	1	·0045	7	029	12·5	18·2	240	do	LCAB
EXHAUST GAS BOILER FAN	1	1	·0225	7	064	24	46	470	do	do
REFRIG FANS	6	1	·007	7	036	11·5	24	558	do	do
REFRIG FAN	4	1	·0045	7	029	7	18·2	680	do	do

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All Conductors are of annealed copper conforming to British Standard Specification No. 7.

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

The foregoing is a correct description.

p.pro. THE SUNDERLAND FORGE & ENG. CO.LTD.,

W-Park- Electrical Engineers. Date 24.9.34.

COMPASSES.

Distance between electric generators or motors and standard compass 98 FEET

Distance between electric generators or motors and steering compass 90 FEET

The nearest cables to the compasses are as follows :—

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

A cable carrying ·07 *Ampères* 2 *feet from standard compass* 2 *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 No

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* all *course in the case of the standard compass, and* nil *degrees on* all *course in the case of the steering compass.*

pro WORKMAN CLARK (1928) LIMITED.

F. Cunningham Secretary. *Builder's Signature.* Date 25.9.34.

Is this installation a duplicate of a previous case ..... *If so, state name of vessel* .....

General Remarks (State quality of workmanship, opinions as to class, &c.

The main generators were constructed under Special Survey. The materials and workmanship are good. They were tested at full load with satisfactory results at moored & sea trials. The vessel was wired in accordance with the approved plan and the Rules and the megger tests of the switchboards, motors and generators were satisfactory. The installation was tried out at moored and sea trials. In my opinion the vessel is eligible for notation "Electric Light"

Sold £4 F.V. 3/10/34.

Total Capacity of Generators 1100 *Kilowatts.*

The amount of Fee ... ... £ 59 : 10 : When applied for, 28/9/1934.

Travelling Expenses (if any) £ : : When received, 12.10.34 £10 15s

John Rundle
Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 12 OCT 1934

Assigned See Bel. F.E. 11372

Im.9.30.—Transfer.

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