Rpt. 13.

No. 11,296

REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

10 MAY 1934
Received at London Office

Date of writing Report ..... 19 When handed in at Local Office 9th May 1934 Port of Belfast.

No. in Reg. Book. Survey held at Belfast. Date, First Survey Included in T.E. Machy Last Survey 19 (Number of Visits.....)

on the "INCOMATI". Tons Gross 7368.51 Net 4539.90

Built at Belfast. By whom built Workman, Clark (1928) Ltd. Yard No. 532. When built 1934-4.

Owners Bank Line Ltd Port belonging to Belfast

Electric Light Installation fitted by The Sunderland Forge & Eng. Co. Ltd. Contract No. 532 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 Engine Room. Two Port and Two 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* Engine Room Port Side Aft.

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, *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, No. Time Lag, & Rev. Current Circuit Bkr. with additional Pos. and Aux. Contacts for each Generator. The 3rd. pole acting as an equalizer. Double Pole, Quick Break switch and fuses for each outgoing circuit.

Instruments *on main switchboard* 6 *ammeters* 4 *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*

Earth Lamp Switch and Fuse on each pole

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

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W179-0164 (112)

Cables: *Single, twin, concentric, or multicore* Single, Twin, M/core *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* 7.35 VOLTS LIGHTING, 8.66 VOLTS POWER.

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 secured with G.I. clips in Machinery Spaces etc, Lead Covered & Braided secured with brass clips in Accomⁿ

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* —

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* Emer. Dynamo & Emer. Switchboard fitted in Emer. House with D.P. %o switch and fuses for Generator. The Generator is driven by a Diesel Engine. D.P. switch and fuses for each outgoing circuit. Interconnector cables between Main and Emergency Switchboards. Also D.P. %o. Time lag & Rev. Current Circuit Breaker with no volt coil, in circuit with supply to Main Board

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 — *, 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 —

Note 2 6 cy. auxiliary engines substituted in lieu of 2 original 5 cy. engines
2 " " " " " Cal. 8.38 to 10386
Cal 1138 to 10467.

PARTICULARS OF GENERATING PLANT.

Description of Generator.	No. of	Kilowatts.	Volts.	Ampères.	Revs. per Min.	Driven by	Fuel Used.	Flash Point of Fuel.
Main	4	100	220	455	600	DIESEL ENGINE		
Auxiliary								
Emergency	1	16	220	73	850	DIESEL ENGINE		
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 Ampères: In Circuit.	Total Maximum Current Ampères: Rule.	Approximate Length (Lead and Return.) Feet.	Insulated with	How Protected.
Main Generator	2	·19640	37	·083	227.5	266	512	V.C.	L.C&B.
Equaliser Connections	1	·19640	37	·083	227.5	266	128	V.C.	L.C&B.
Auxiliary Generator									
Emergency Generator	1	·03375	19	·044	73	78	48	V.C.	L.C&B.
Rotary Transformer Motor									
Rotary Transformer Generator									
Engine Room. Star	1	·00455	7	·029	12.5	18.2	230	V.I.R.	L.C&B.
Engine ~~Boiler~~ Room. Port	1	·00455	7	·029	13.3	18.2	20	V.I.R.	L.C&B.
Interconnector to Auxiliary Switchboards	1	·03375	19	·044	73	78	368	V.C.	L.C&B.
Engrs. Officers & Crew	1	·02214	7	·064	56.2.	68	112	V.C.	L.C&B.
Boat Lighting	1	·01046	7	·044	6.56	31	656	V.I.R.	L.C&B.
Emergency Lighting	1	·00701	7	·036	13.46	24	288	V.I.R.	L.C&B.
Navigation	1	·00299	3	·036	3.3	12	656	V.I.R.	L.C&B.
Galley Gear	1	·07592	19	·072	138	141	288	V.C.	L.C&B.
Accommodation Lighting	1	·03960	19	·052	79.5	94	184	V.C.	L.C&B.
Laundry Gear	1	·02214	7	·064	54.1	68	384	V.C.	L.C&B.
Refrig. Gear	1	·19640	37	·083	226.2	266	64	V.C.	L.C&B.
Donkey Boiler Fuel Heater	1	·00455	7	·029	9.1	18.2	56	V.I.R.	L.C&B.
Oil Fuel Heater	1	·06	19	·064	109	122	198	V.C.	L.C&B.
Wireless	1	·01046	7	·044	31	31	616	V.I.R.	L.C&B.
Searchlight									
Masthead Lights. Each.	1	·00194	3	·029	·18	7.8	536 Ford. 656 Aft.	V.I.R.	L.C&B.
Side Lights Each	1	·00194	3	·029	·18	7.8	80	V.I.R.	L.C&B.
Compass Lights	1	·00194	3	·029	·11	7.8	48	V.I.R.	L.C&B.
Poop Lights	1	·01046	7	·044	14.22	31	368	V.I.R.	L.C&B.
Cargo Lights	1	·01462	7	·052	26.18	37	112	V.I.R.	L.C&B.
Arc Lamps									
Heaters	1	·06	19	·064	120.6	122	528	V.C.	L.C&B.

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 Ampères: In Circuit.	Total Maximum Current Ampères: Rule.	Approximate Length (Lead and Return.) Feet.	Insulated with	How Protected.
Ballast Pump	1	1	·06	19	·064	100	122	144	V.C.	L.C&B.
Main Bilge Line Pumps	1	1	·02214	7	·064	64	68	224	V.C.	L.C&B.
General Service Pumps	2	1	·0396	19	·052	80	94	160	V.C.	L.C&B.
Emergency Bilge Pump	1	1	·02214	7	·064	64	68	448	V.C.	L.C&B.
Sanitary Pump										
Cooling ~~Circ.~~ Sea Water Pumps	2	1	·07592	19	·072	132	141	240	V.C.	L.C&B.
Cooling ~~Circ.~~ Fresh Water Pumps	2	1	·07592	19	·072	132	141	256	V.C.	L.C&B.
Air Compressors	2	1	·19640	37	·083	257	266	272	V.C.	L.C&B.
Fresh Water Pumps	2	1	·00701	7	·036	21	24	288	V.I.R.	L.C&B.
Engine Turning Gear Motors	2	1	·03375	19	·044	73.5	78	208	V.C.	L.C&B.
Engine Reversing Gear										
Lubricating Oil Pumps	2	1	·02214	7	·064	52	68	224	V.C.	L.C&B.
Oil Fuel Transfer Pumps	2	1	·02214	7	·064	48	68	144	V.C.	L.C&B.
Windlass	1	1	·19640	37	·083	235	338	240	V.C.	L.C&B.
Winches, Forward	4	1	·06	19	·064	120	136	528	V.C.	L.C&B.
Winches, Midship	2	1	·06	19	·064	120	136	464	V.C.	L.C&B.
Winches, Aft	5	1	·06	19	·064	120	136	368	V.C.	L.C&B.
Steering Gear—Motors	2	1	·0396	19	·052	92	94	400	V.C.	L.C&B.
(a) Motor Generator										
(b) Main Motor										
Workshop Motor	1	1	·00701	7	·036	21	24	272	V.I.R	L.C&B.
Ventilating Fans	4	1	·02214	7	·064	55	68	190	V.C.	L.C&B.
E.R. Vent Fans.	3	1	·00455	7	·029	13.75	18.2	192	V.I.R.	L.C&B.
Crane Motor	1	1	·00455	7	·029	18	18.2	150	V.I.R.	L.C&B.
Fuel Valve Cooling Pumps	2	1	·00455	7	·029	13.75	18.2	270	V.I.R.	L.C&B.
Oil Separators	3	1	·00455	7	·029	14	18.2	208	V.I.R.	L.C&B.
Fuel Priming Pumps	2	1	·00299	3	·036	10	12	280	V.I.R	L.C&B.
Donkey Boiler Fuel Fan	1	1	·00455	7	·029	7.5	18.2	45	V.I.R	L.C&B.

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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., Electrical Engineers. Date 27.4.34.

W. Park.

COMPASSES.

Distance between electric generators or motors and standard compass 125 FEET

Distance between electric generators or motors and steering compass 116 FEET.

The nearest cables to the compasses are as follows:—

A cable carrying 3.3 Ampères 9 feet from standard compass 8 feet from steering compass.

A cable carrying .11 Ampères 9 feet from standard compass Led into ~~feet from~~ steering compass.

A cable carrying .11 Ampères Led into feet from standard compass 8 ~~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 all courses in the case of the standard compass, and nil degrees on all courses in the case of the steering compass.

pro WORKMAN CLARK (1928) LIMITED.

F. Cunningham Secretary. Builder's Signature. Date

Is this installation a duplicate of a previous case yes. If so, state name of vessel "Inchanga".

General Remarks (State quality of workmanship, opinions as to class, &c. This installation has been fitted in the vessel under special survey. The materials and workmanship are sound and good. An insulation resistance test has been applied and the installation tried out under working conditions with satisfactory results. In my opinion the vessel is eligible for notation in the Register Book of "Electric Light".

Noted
L.J.
15/5/34.

Total Capacity of Generators 416. Kilowatts.

The amount of Fee ... ... £41 : 18 : When applied for, 4th May 1934

Travelling Expenses (if any) £ : : When received, 27 1934 7D.

John. K. Williams.
Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 18 MAY 1934

Assigned Elec. Lt.

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

1m,9,30.—Transfer.

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