

17.8 NOV 1939

Rpt. 13.

No. 12494

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office.....

Date of writing Report... 4th Nov 1939... When handed in at Local Office... 16. 11. 39... Port of BELFAST

No. in Survey held at BELFAST Date, First Survey 20. April 1939 Last Survey 5th Nov 1939
Reg. Book. (Number of Visits... 18...)

20298 on the STEEL TWIN SCREW MOTOR VESSEL "AUCKLAND STAR" Tons { Gross..... Net.....

Built at BELFAST By whom built MESSRS HARLAND & WOLFF Yard No. 1017 When built 1939

Owners BLUE STAR LINE LTD Port belonging to BELFAST

Electrical Installation fitted by MESSRS HARLAND & WOLFF Contract No. 1016 When fitted 1939

Is vessel fitted for carrying Petroleum in bulk NO Is vessel equipped with D.F. YES E.S.D. YES Gy.C. YES Sub.Sig. —

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

Heating 220 Power 220 Direct or Alternating Current, Lighting DIRECT Power DIRECT If Alternating Current state frequency — Prime Movers,

has the governing been tested and found efficient when the whole load is suddenly thrown on and off YES Are turbine emergency governors fitted with a

trip switch as per Rule — 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

POSITIVE 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 IN MOTOR ROOM, TANK TOP LEVEL ONE PORT & TWO STAR

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 ON PLATFORM AFT. END OF MOTOR ROOM

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 — 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 T.P. REVERSE CURRENT

CIRCUIT BREAKERS TIME LIMITS & OVERLOADS ON TWO POLES FOR GENERATORS

and for each outgoing circuit D.P. OVERLOAD CIRCUIT BREAKERS OR D.P. SWITCHES & FUSES

Are compartments containing switchboards composed of fire-resisting material or lined as per Rule YES Instruments on main switchboard 14

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 INDICATING LAMPS



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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**, are the reversed current protection devices connected on the pole opposite to the equaliser connection. **YES**, have they been tested under working conditions. **YES**. 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.

state maximum fall of pressure between bus bars and any point under maximum load. **7-5 VOLT HEATING BOX** 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 exposed ends. **YES**.

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. State how the cables are supported and protected. **CLIPPED TO PERFORATED PLATING SHEET METAL COVER WHERE NECESSARY**.

Are all lead sheaths, armoring 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 effectively bushed. **YES** and with what material. **SHEET LEAD**. Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule. **YES**. Emergency Supply, state position. **NONE FITTED**.

and method of control. **Navigation Lamps**, are they separately wired. **YES** controlled by separate double pole switches. **YES** and fuses. 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**.

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. **YES**, if so, how are they protected. **GUARDED STIRRUP PENDANTS**.

and where are the controlling switches fitted. **LOCALLY**, are all fittings suitably ventilated. **YES**, are all fittings and accessories constructed and installed as per Rule. **YES**. Searchlight Lamps, No. of. **ONLY**, whether fixed or portable. **PORTABLE**, 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. and vertically.

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**. If portable lamps for use in dangerous spaces are supplied, are they of a self-contained battery-fed flameproof type. **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 megger 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. | Amps. | Revs. per Min. | | Fuel Used. | Flash Point of Fuel. |
| MAIN | 3 | 330 | 220 | 1500 | 300 | DIESEL ENGINE | DIESEL OIL ABOVE 150° F | |
| EMERGENCY | — | | | | | | | |
| ROTARY TRANSFORMER | — | | | | | | | |

| DESCRIPTION | NO. OF MOTORS | CONDUCTORS | | COMPOSITION OF STRAND | | TOTAL MAXIMUM CURRENT AMPS. | | APPROXIMATE LENGTH LEAD RETURN FEET | INSULATED WITH. | HOW PROTECTED |
|---------------------------------|---------------|--------------|-------------------------------------|-----------------------|------|-----------------------------|-------|-------------------------------------|-------------------|------------------------|
| | | NO. PER POLE | TOTAL EFFECT AREA PER POLE SQ. INS. | NO. | DIA. | IN CIRCUIT | RULE. | | | |
| 2 H.P. REFRIG. COOLER FANS | 3 | 1 | 0.003 | 3 | .036 | 9.2 | 12 | 140 | RUBBER | HARD RUBBER & BRAIDING |
| 1.5 H.P. Do. | 3 | 1 | 0.003 | 3 | .036 | 7 | 12 | 80 | Do. | Do. |
| 1 H.P. Do. | 2 | 1 | 0.002 | 3 | .029 | 4.8 | 7.8 | 90 | Do. | Do. |
| 0.5 H.P. Do. | 4 | 1 | 0.002 | 3 | .029 | 2.55 | 7.8 | 90 | Do. | Do. |
| 18 H.P. REFRIG. SW. CIRC. PUMPS | 2 | 1 | 0.0225 | 7 | .064 | 70 | 75 | 160 | VARNISHED CAMBRIC | LEAD & BRAIDING |
| 18 H.P. REFRIG. BRINE PUMPS | 5 | 1 | 0.0225 | 7 | .064 | 70 | 75 | 220 | Do. | Do. |
| 11 H.P. HALLMARK M/Cs. | 2 | 1 | 0.0145 | 7 | .052 | 45 | 57 | 60 | Do. | Do. |
| 3.25 H.P. PLUNGER BRINE PUMP | 1 | 1 | 0.0045 | 7 | .029 | 13.6 | 18.2 | 200 | Do. | Do. |
| 3 H.P. BRINE PUMP | 1 | 1 | 0.0045 | 7 | .029 | 12.6 | 18.2 | 200 | Do. | Do. |
| 3 H.P. REFRIG. F.W. PUMP | 1 | 1 | 0.0045 | 7 | .029 | 12.6 | 18.2 | 150 | Do. | Do. |
| 0.75 H.P. Do. OIL PURIFIER | 1 | 1 | 0.002 | 3 | .029 | 3.4 | 7.8 | 40 | RUBBER | HARD RUBBER & BRAIDING |
| 0.125 H.P. CO2 INDICATOR | 1 | 1 | 0.002 | 3 | .029 | 0.32 | 7.8 | 30 | Do. | Do. |
| 0.75 H.P. PUBLIC ROOMS VENT FAN | 1 | 1 | 0.002 | 3 | .029 | 3.6 | 7.8 | 100 | Do. | LEAD & BRAIDING |
| 4.5 H.P. VAPOUR EXT. FANS | 2 | 1 | 0.007 | 7 | .036 | 18.5 | 28.0 | 60 | VARNISHED CAMBRIC | Do. |
| 5 H.P. 6 TON MOTOR R. CRANES | 2 | 1 | 0.007 | 7 | .036 | 21.0 | 28.0 | 80 | Do. | Do. |
| 1.5 H.P. BOILER BLOWER FAN | 1 | 1 | 0.003 | 3 | .036 | 8.0 | 12.0 | 35 | RUBBER | Do. |
| 0.25 H.P. Do. FUEL PUMP | 1 | 1 | 0.0045 | 7 | .029 | 14.0 | 18.2 | 20 | VARNISHED CAMBRIC | LEAD & BRAIDING |
| 3.5 H.P. LUB. OIL PURIFIER | 2 | 1 | 0.0045 | 7 | .029 | 14.0 | 18.2 | 20 | Do. | Do. |
| 3.5 H.P. FUEL Do. | 2 | 1 | 0.0045 | 7 | .029 | 11.2 | 18.2 | 30 | Do. | Do. |
| 2.5 H.P. PURIFIED F.O. PUMP | 1 | 1 | 0.0045 | 7 | .029 | 4.0 | 7.8 | 40 | RUBBER | Do. |
| 0.5 H.P. LUB. OIL PUMP | 1 | 1 | 0.002 | 3 | .029 | 4.0 | 7.8 | 40 | VARNISHED CAMBRIC | Do. |
| 3 H.P. LATHE | 1 | 1 | 0.0045 | 7 | .029 | 13.0 | 18.2 | 30 | RUBBER | Do. |
| 2.25 H.P. GRINDING M/C. | 1 | 1 | 0.003 | 3 | .036 | 9.9 | 12.0 | 30 | Do. | Do. |
| 2 H.P. DRILLING M/C | 1 | 1 | 0.003 | 3 | .036 | 8.7 | 12.0 | 30 | Do. | Do. |
| 0.75 H.P. HALLMARK M/Cs. | 3 | 1 | 0.002 | 3 | .029 | 3.6 | 7.8 | 40 | Do. | HARD RUBBER & BRAIDING |

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 | 330 | 2 | 127/093" | 1500 | 1612 | 170 | VARNISHED CAMBRIC | LEAD & BRAIDING |
| " " EQUALISER | | 1 | 127/093" | - | 815 | 85 | Do. | Do. |
| EMERGENCY GENERATOR | | | | | | | | |
| ROTARY TRANSFORMER: MOTOR | | | | | | | | |
| " " GENERATOR | | | | | | | | |

MAIN DISTRIBUTION CABLES.

| DESCRIPTION. | KILOWATTS. | No. in Parallel Per Pole. | Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm. | In the Circuit. | Rule. | APPROX. LENGTH (lead plus return feet). | INSULATED WITH. | HOW PROTECTED. |
|--------------------------------------|------------|---------------------------|--|-----------------|-------|---|-----------------|----------------|
| AUX. SWITCHBOARDS AND SECTION BOARDS | | | | | | | | |
| MASTERBOARD "E" REFRIG. | | 2 | 127/093" | 1580 | 1620 | 265 | Do. | Do. |
| Do. "A" HEATING | | 1 | 37/064" | 169 | 210 | 540 | Do. | Do. |
| Do. "B" DO. | | 1 | 37/083" | 277 | 296 | 370 | Do. | Do. |
| Do. "B" WINCHES | | 1 | 37/072" | 211 | 246 | 360 | Do. | Do. |
| Do. "C" DO. | | 1 | 61/103" | 451 | 540 | 700 | Do. | Do. |
| Do. "D" DO. | | 1 | 91/093" | 594 | 628 | 320 | Do. | Do. |
| MASTERBOARD "A" LIGHTING | | 1 | 19/052" | 58 | 104 | 550 | Do. | Do. |
| Do. "COOKING | | 1 | 19/044" | 77 | 87 | 240 | Do. | Do. |
| Do. "B" LIGHTING | | 1 | 19/052" | 76 | 104 | 360 | Do. | Do. |
| Do. "COOKING | | 1 | 37/103" | 317 | 385 | 300 | Do. | Do. |
| Do. "A" HEATING | | | | | | | | |

LIGHTING AND HEATING, ETC., CABLES.

| DESCRIPTION. | No. in Parallel Per Pole. | Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm. | In the Circuit. | Rule. | APPROX. LENGTH (lead plus return feet). | INSULATED WITH. | HOW PROTECTED. |
|------------------------------------|---------------------------|--|-----------------|-------|---|-----------------|------------------------|
| WIRELESS | 1 | 7/044" | - | 42 | 640 | Do. | Do. |
| NAVIGATION LIGHTS | | | | | | | |
| LIGHTING AND HEATING | | | | | | | |
| MOTOR ROOM S & F BOX LIGHTING | 1 | 7/044" | 30 | 42 | 42 | Do. | Do. |
| Do. Do. Do. | 1 | 7/044" | 30 | 42 | 40 | Do. | Do. |
| Do. Do. Do. | 1 | 7/044" | 28 | 42 | 50 | Do. | Do. |
| SEARCHLIGHT | 1 | 37/083" | - | 296 | 485* | Do. | Do. |
| SIDE LIGHTS | 1 | 3/036" | 0.18 | 12 | 100 | RUBBER | LEAD & BRAIDING |
| STERN LIGHTS | 1 | 3/036" | 0.18 | 12 | 900 | Do. | HARD RUBBER & BRAIDING |
| CARGO LIGHTS FOR ^D AFT. | 1 | 7/064" | 20 | 75 | 825 | V.C. | LEAD & BRAIDING |
| Do. Do. Do. | 1 | 7/064" | 20 | 75 | 648 | Do. | Do. |
| OTHER LIGHTING CIRCUITS | 1 | 3/029" | 5 (MAX) | 7.9 | VARIOUS | RUBBER | H.R. BRAIDING |
| 500/1500 WATT HEATERS | 1 | 3/029" | 2 3/6.9 | 7.9 | LENGTHS | " | " |
| 2000 " " | 1 | 7/029" | 9.1 | 18.2 | " | " | " |

* LOOPED WITH WINDLASS.

MOTOR CABLES.

| ALL IMPORTANT MOTORS TO BE ENUMERATED. | No. | B.H.P. | No. in Parallel Per Pole. | Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm. | In the Circuit. | Rule. | APPROX. LENGTH (lead plus return feet). | INSULATED WITH. | HOW PROTECTED. |
|--|-----|--------|---------------------------|--|-----------------|-------|---|-------------------|------------------------|
| BALLAST PUMP | 1 | 24 | 1 | 19/052" | 95 | 104 | 300 | VARNISHED CAMBRIC | LEAD & BRAIDING |
| MAIN BILGE LINE PUMPS | 1 | 12.5 | 1 | 7/052" | 50 | 57 | 320 | Do. | Do. |
| GENERAL SERVICE PUMP | 1 | 24 | 1 | 19/052" | 95 | 104 | 280 | Do. | Do. |
| AUX. F.W. CIRC. PUMP | 1 | 5 | 1 | 7/036" | 20 | 28 | 300 | Do. | Do. |
| SANITARY PUMP | 1 | 24 | 1 | 19/052" | 95 | 104 | 240 | Do. | Do. |
| CIRC. S.W. PUMP | 3 | 32 | 1 | 19/064" | 123 | 135 | 336 | Do. | Do. |
| CIRC. F.W. PUMP | 2 | 24 | 1 | 19/052" | 95 | 104 | 300 | Do. | Do. |
| F.W. PUMP | 1 | 6 | 1 | 7/036" | 24 | 28 | 340 | Do. | Do. |
| ENGINE TURNING GEAR | 2 | 15 | 1 | 7/064" | 58.5 | 75 | 95 | Do. | Do. |
| AUX. S.W. CIRC. PUMP | 1 | 8.5 | 1 | 7/044" | 34 | 42 | 280 | Do. | Do. |
| LUBRICATING OIL PUMPS | 3 | 90 | 1 | 37/103" | 355 | 385 | 170 | Do. | Do. |
| OIL FUEL TRANSFER PUMP | 1 | 14 | 1 | 7/064" | 56 | 75 | 115 | Do. | Do. |
| WINDLASS | 1 | 75 | 1 | 37/083" | 300 | 296 | 475 | Do. | Do. |
| AIR COMPRESSOR | 2 | 95 | 1 | 37/103" | 360 | 385 | 270 | Do. | Do. |
| STEERING GEAR | 2 | 57 | 1 | 37/072" | 270 | 303* | 450 | Do. | Do. |
| VENTILATING FANS MOTOR RM | 5 | 1 3/4 | 1 | 3/036" | 7.5 | 12 | 330 | RUBBER | LEAD & BRAIDING |
| Do. Do. REFRIG. M/C ^{HY} RM | 2 | .5 | 1 | 3/029" | 2.2 | 7.8 | 250 | Do. | HARD RUBBER & BRAIDING |
| REFRIG. COOLER FAN | 3 | 17.5 | 1 | 19/064" | 68 | 83 | 250 | Do. | Do. |
| Do. | 5 | 9.5 | 1 | 7/064" | 39 | 46 | 300 | Do. | Do. |
| Do. | 1 | 6.25 | 1 | 7/044" | 26 | 31 | 120 | Do. | Do. |
| Do. | 6 | 5.25 | 1 | 7/036" | 22 | 24 | 120 | Do. | Do. |
| Do. | 4 | 3.25 | 1 | 7/029" | 14 | 18.2 | 150 | Do. | Do. |
| Do. | 4 | 3 | 1 | 7/029" | 12.1 | 18.2 | 150 | Do. | Do. |

* 1/2 HOUR RATING.

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.



Electrical Engineers. Date.....

COMPASSES.

Minimum distance between electric generators or motors and standard compass..... 150 FT. 30 FT. NEAREST MOTOR

Minimum distance between electric generators or motors and steering compass..... 145 FT. 32 FT. DO.

The nearest cables to the compasses are as follows:—

A cable carrying 0.09 Ampères 12 feet from standard compass ON feet from steering compass.

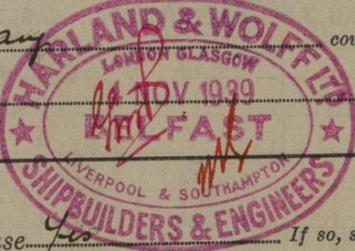
A cable carrying 0.18 Ampères 6 feet from standard compass 8 feet from steering compass.

A cable carrying 4.8 Ampères 6 feet from standard compass 6 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.



Builder's Signature. Date.....

Is this installation a duplicate of a previous case? Yes If so, state name of vessel Wellington Star

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, and in accordance with the approved plans, tested under full working conditions and found satisfactory. The materials and workmanship are good.

Noted
21/11/39.

Total Capacity of Generators..... 990 Kilowatts.

The amount of Fee ... £ 69 : 15 : 0 When applied for, 16.11.39
 Travelling Expenses (if any) £ : : When received, 10/11/39

Committee's Minute
 Assigned..... See Bel 76 12491

H. Haffner
 Surveyor to Lloyd's Register of Shipping.

2nd, 10, 38.—Transfer. (MADE IN ENGLAND.) (The Surveyors are requested not to write on or below the space for Committee's Minute.)