

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Date of writing Report 29-11-41. When handed in at Local Office. Received at London Office 23 DEC 1941

No. in Survey held at Haderton Hall on Tees Date, First Survey 10-9-41 Last Survey 27-11-1941
Reg. Book. 36350 on the s/s "Empire Bell" (Number of Volls. 11)

Built at Haderton Hall on Tees By whom built Furness Shipbuilding Co. Ltd. Tons { Gross. Net. }
Owners The Ministry of War Transport Port belonging to Middlesbrough When built 1941

Electrical Installation fitted by Furness Shipbuilding Co. Ltd. Contract No. 235 When fitted 1941
Is vessel fitted for carrying Petroleum in bulk Yes Is vessel equipped with D.F. Yes E.S.D. Yes Gy.C. No Sub.Sig. No.

Have plans been submitted and approved Yes System of Distribution Two-Wire insulated Voltage of supply for Lighting 110
Heating No Power 110 Direct or Alternating Current, Lighting Yes Power Yes 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 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 No, 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 None fitted 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 aft of engine room on raised platform

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 aft of engine room on raised platform

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 "Sandwich" 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 switches a double pole
Quick-break Knife Switch and double pole Cartridge type fuse.

and for each outgoing circuit a double pole quick-break Knife Switch and double-pole
Cartridge type fuse

Are compartments containing switchboards composed of fire-resisting material or lined as per Rule Yes Instruments on main switchboard 2
ammeters 2 voltmeters synchronising devices. For compound machines in parallel is the ammeter connected on the pole opposite to the
equaliser connection Earth Testing, state means provided E. lamps connected to E. through bus + fused

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, are the reversed current
protection devices connected on the pole opposite to the equaliser connection, have they been tested under working conditions, and at what current
did they operate Joint Boxes, Section Boards and Distribution Boards, is the construction and position as per Rule Yes

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 5 + 4/16, 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

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 no, if so, are they adequately protected _____ Are cables in machinery spaces, galleys, laundries, etc., lead covered yes or run in conduit _____ State how the cables are supported and protected Cables in machinery space, galley, along deck platform to entrance and forecabin, varnished, painted, insulated, lead covered & armoured & shipped to subside of platform on metal tray. In accommodation lead covered & lead & cable in work ground.

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 bushed yes and with what material lead. Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule yes. Emergency Supply, state position _____ and method of control _____

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 _____, are they adequately ventilated _____ what is the battery capacity in ampere hours _____

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 By "Distinction" flameproof lighting fittings installed as approved.

and where are the controlling switches fitted in open accommodation, are all fittings suitably ventilated yes

are all fittings and accessories constructed and installed as per Rule yes. Searchlight Lamps, No. of none fixed, whether fixed or portable _____, are their fittings as per Rule _____ Heating and Cooking, is the general construction as per Rule _____

are the frames effectually earthed _____, are heaters in the accommodation of the convection type _____ 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 _____ 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 _____ 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 _____ Control Gear and Resistances, are they constructed and fitted as per Rule yes Lightning Conductors, where required are they fitted as per Rule none 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 | | | Revs. per Min. | DRIVEN BY | WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE. | |
|---------------------------|--------|------------|--------|----------|----------------|-----------------|--|----------------------|
| | | Kilowatts. | Volts. | Ampères. | | | Fuel Used. | Flash Point of Fuel. |
| MAIN | 1 | 20 | 110 | 182 | 600 | Single Cylinder | | |
| de Ganssing | 1 | 20 | 110 | 182 | 600 | Steam Engine | | |
| EMERGENCY | | | | | | Single Cylinder | | |
| ROTARY TRANSFORMER | | | | | | Steam Engine | | |

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 | 2 x 20 | 1 | 191.085 | 182 | 191 | 32140 | V.C. | L.C.A.B. |
| " " EQUALISER | | | | | | | | |
| 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 ... | | | | | | | |
| Aux. Switchboard (Main Feed) | 1 | 57.093 | 75 | 843 | 670 | V.C. | L.C.A.B. |
| " " (Emergency Feed) | 1 | 57.093 | 75 | 843 | 650 | " | " |
| Off Lighting Sub. Bd. | 1 | 191.085 | 60 | 184 | 160 | " | " |
| Other Connections | 1 | 191.085 | - | 191 | 240 | " | " |

LIGHTING AND HEATING, ETC., CABLES.

| | | | | | | | |
|---|---|-------|-------|----|------|------|----------|
| WIRELESS (off sub-switchboard) | 1 | 7.044 | 15 | 42 | 134 | V.C. | L.C.B. |
| NAVIGATION LIGHTS (off sub-switchboard) | 1 | 7.044 | 12 | 42 | 180 | " | " |
| LIGHTING AND HEATING | | | | | | | |
| Engine Room Light DB No. 1 | 1 | 7.044 | 15 | 42 | 64 | V.C. | L.C.A.B. |
| " " " " " 2 | 1 | 7.044 | 15 | 42 | 70 | " | " |
| Forecabin Lighting Bd. | 1 | 7.044 | 8 | 42 | 364 | " | " |
| Final Heats DB | | | | | | | |
| Mid-Portable DB | | | | | | | |
| Comp Room Light DB | | | | | | | |
| 2. Off sub. Light DB (off sub. switchboard) | 1 | 7.044 | 16+21 | 42 | 6090 | V.C. | L.C.B. |
| 2. Engg. " " (off aft. break) | 1 | 7.044 | 16+18 | 42 | 1670 | V.C. | L.C.A.B. |
| off Portable " " " " | 1 | 7.044 | - | 42 | 60 | V.C. | L.C.A.B. |
| Emergency W/T | 1 | 7.044 | - | 42 | 320 | V.C. | L.C.A.B. |

MOTOR CABLES.

| ALL IMPORTANT MOTORS TO BE ENUMERATED. | No. | B.H.P. | 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. | | | |
| off Vent Fan | 1 | 3. | 1 | 7.044 | 28 | 42 | 272 | V.C. | L.C.A.B. |
| Heats " " | 1 | 3. | 1 | 7.044 | 28 | 42 | 136 | " | L.C.B. |

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.

FURNACE SHIPBUILDING Co. LIMITED

P. P. Glover

Electrical Engineers.

Date

4th Dec 1941

COMPASSES.

Minimum distance between electric generators or motors and standard compass 285 ft.

Minimum distance between electric generators or motors and steering compass 280 ft.

The nearest cables to the compasses are as follows:—

A cable carrying 14 Ampères 7 feet from standard compass 10 ft. feet from steering compass.

A cable carrying 14 Ampères 10 ft. feet from standard compass 7 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.

FURNACE SHIPBUILDING Co. LIMITED

Jas. M. Robertson

Builder's Signature.

Date

Is this installation a duplicate of a previous case Yes If so, state name of vessel "Empire Emerald"

Plans. Are approved plans forwarded herewith No If not, state date of approval 6-11-40

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 installed under special survey in accordance with the approved plans and the Ministry of Shipping Specifications and amendments thereto. On completion the equipment was operated under full working conditions with satisfactory results, and the insulation resistance of each circuit was measured and found good. The materials used are of good quality and design. This equipment is in my opinion suitable for a closed vessel.

Total Capacity of Generators 20 (+ 20.04) Kilowatts.

The amount of Fee ... £ 25 : 0 : 0

When applied for, 22/12/1941

Travelling Expenses (if any) £ : : When received, 19....

Surveyor to Lloyd's Register of Shipping.

J. D. Mearns

Committee's Minute TUE 6 JAN 1942

Assigned See p.c. machinery report

5014.33.—Transfer. (MADE AND PRINTED IN ENGLAND.) (The Surveyors are requested not to write on or below the space for Committee's Minutes.)

