Rpt. 13.

No. 32481

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office SEP 24 1938

Date of writing Report 10th Sept., 1938 When handed in at Local Office 23 SEP. 1938 Port of Sunderland

No. in Reg. Book. Suppl. 88656 Survey held at Sunderland Date, First Survey 6th August, Last Survey 9th September, 1938 (Number of Visits 6)

on the S.S. "JOSEPH SWAN" Tons Gross 1571 Net 913

Built at Sunderland By whom built S. P. Austin & Sons, Ltd. Yard No. 350 When built 1938

Owners London Power Co. Ltd. Port belonging to London

Electric Light Installation fitted by The Sunderland Engr. Eng. Co. Ltd. Contract No. 350 When fitted 1938

Is the Vessel fitted for carrying Petroleum in bulk No

System of Distribution Double wire

Pressure of supply for **Lighting** 110 volts, **Heating** 110 volts, **Power** 110 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 No, 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 Yes, Certs. herewith Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing None fitted

Have certificates for generators under 100 kw. been supplied and approved Manufacturers' test certs. only supplied

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 starboard side aft, 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 starboard side near generators 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 —,

is it of an approved type —, 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 No are all screws and nuts securing connections effectively locked Yes are any fuses fitted on the live side of switches No **Main Switchgear,** description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches D.P.S.O.s & D.P. fuses on generator mains; D.P.C.O.s & O.P. fuses on outgoing circuits

Are turbine driven generators fitted with emergency trip switch as per rule — Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material — **Instruments** on main switchboard Two ammeters Two 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 E lamps coupled to E through switches & fuses **Switches, Circuit Breakers and Fusible Cut-outs,** do these comply with the requirements of the Rules Yes are the fusible cutouts of an approved type Yes have the reversed

current protection devices been tested under working conditions — are all fuses labelled as per rule 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 *are the cables insulated and protected as per Tables* IV, V, X, XI, XII *or* XIII *of the Rules* Yes

If the cables are insulated otherwise than as per Rule, are they of an approved type — **Fall of Pressure,** *state maximum between bus bars and any point of the installation under maximum load* Less than 5·3 volts **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* —, *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 laid under machines or floorplates* No *if so, are they adequately protected* — *Are cables in machinery spaces, galleys, laundries, bathrooms and lavatories lead covered or run in conduit* Yes

Support and Protection of Cables, *state how the cables are supported and protected* L.C.R. cables run in wood casings in holds; L.C.A.R. cables supported up and V.I.R. cables in pipe in machy. Space; L.C. cables in accom.

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, *are the cables and fittings in accordance with the special requirements* —

Joints in Cables, *state if any, and how made, insulated, and protected* home 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 and fibre

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

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* —, *are they ventilated as per Rule* —

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* —, *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* —

Searchlight Lamps, No. of none fitted *whether fixed or portable* —, *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* — *have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing* none fitted *have certificates for all motors for essential services been supplied and approved* Yes, but herewith **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* — *are all fuses of the filled cartridge type* — *are they of an approved type* — *If portable lamps for use in dangerous spaces are supplied, are they of a self-contained, battery-fed flameproof type approved for use in dangerous spaces* —

Spare Gear, *if the vessel is for open sea service have spares been supplied as per Rule* Yes *are they suitably stored in dry situations* Yes

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	2	12	110	109	850	Single cylinder steam engines		
Auxiliary ...								
Emergency ...								
Rotary Transformer								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS. No. per Pole.	CONDUCTORS. Total Nominal Area per Pole Sq. Ins.	COMPOSITION OF STRAND. No.	COMPOSITION OF STRAND. Diameter.	TOTAL MAXIMUM CURRENT. AMPERES. Circuit.	TOTAL MAXIMUM CURRENT. AMPERES. Rule.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
Main Generator	1	·06	19	·064	109	135	18	V.C.	L.C.R.
Equaliser Connections ...									
Auxiliary Generator ...									
Emergency Generator ...									
Rotary Transformer { Motor ... / Generator ...									
Engine Room	1	·0045	7	·029	9	18.2	4	V.I.R.	L.C.A.R.
Boiler Room									
Auxiliary Switchboards ...									
Navigation Lts.	1	·0045	7	·029	5	18.2	360	V.I.R.	L.C.R.
Shore Connection	1	·0225	7	·064	30	46	20	V.I.R.	L.C.A.R.
Accommodation									
Masthead Lts.	1	·0045	7	·029	5	18.2	340	V.I.R.	L.C.R.
Aft Lts.	1	·003	3	·036	9	12	75	V.I.R.	L.C.R.
Wireless									
Searchlight									
Masthead Light	1	·0015	1	·0444	·36	6.1	200	V.I.R.	L.C.R.
Side Lights	1	·0015	1	·0444	·36	6.1	60	V.I.R.	L.C.
Compass Lights	1	·0015	1	·0444	·14	6.1	40	V.I.R.	L.C.
STERN Light	1	·0015	1	·0444	·36	6.1	360	V.I.R.	L.C.R.
Cargo Lights									
Heaters 5.15 KW. Cooker	1	·04	19	·052	54	64	300	V.I.R.	L.C.R.

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS. No. Per Pole.	CONDUCTORS. Total Nominal 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										
Main Bilge Line Pumps ...										
General Service Pump ...										
Emergency Bilge Pump ...										
Sanitary Pump										
Circ. Sea Water Pumps ...										
Circ. Fresh Water Pumps...										
Air Compressor										
Fresh Water Pump										
Engine Turning Gear... ...										
Engine Reversing Gear ...										
Lubricating Oil Pumps ...										
Oil Fuel Transfer Pump ...										
Windlass										
Winches, Forward										
Winches, Aft										
Steering Gear—										
(a) Motor Generator ...										
(b) Main Motor	1	1	·06	19	·064	82	135	85	V.C.	L.C.A.R.
Workshop Motor										
Ventilating Fans										

The Electrical Equipment is installed in accordance with the approved plans.

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

The foregoing is a correct description.

Messrs Sunderland Forge & Eng Co Ltd
H Gunner

Electrical Engineers. Date 18 - 9 - 1938

COMPASSES.

Minimum distance between electric generators or motors and standard compass 136 feet

Minimum distance between electric generators or motors and steering compass 130 feet

The nearest cables to the compasses are as follows :—

A cable carrying 14 *Ampères* on the ~~feet from~~ *standard compass* 10 *feet from steering compass.*

A cable carrying 14 *Ampères* 10 *feet from standard compass* on the *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* Every *course in the case of the standard compass, and* Nil *degrees on* Every *course in the case of the steering compass.*

FOR G. P. AUSTIN & SON, LIMITED
J. W. Dugdale
MANAGING DIRECTOR

Builder's Signature. Date Sep. 15. 1938

Is this installation a duplicate of a previous case Yes *If so, state name of vessel* S.S. "Leonard Pearce"

General Remarks (State quality of workmanship, opinions as to class, &c.) The electrical equipment of this vessel has been fitted under special survey. The materials used are of good quality and the workmanship is good. On completion the equipment was run under working conditions, the governors of the dynamo engines were proved, the steering gear motor was run, the main switchboard, distribution boards, switches, fuses, cables, heaters and fittings were examined and tested, the insulation resistance of all circuits was measured and the spare gear was checked. This equipment can, in my opinion, be considered suitable for a classed vessel.

The vessel is equipped with a wireless telephone.

Noted
J.H.
26/9/38.

Total Capacity of Generators 24 *Kilowatts.*

The amount of Fee ... ... £ 19 : 10 : 2 — When applied for, 13 SEP. 1938

Travelling Expenses (if any) £ : : — When received. 11/10/38

J.M.R 12/10.

D. Anderson
Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI 30 SEP 1938

Assigned See F.C. Rpt.

2m.12.36.—Transfer.

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