

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

OCT 25

Date of writing Report 18. 10. 1937 When handed in at Local Office 23. 10. 1937 Port of Glasgow.

No. in Survey held at Port Glasgow & Glasgow. Date, First Survey 6. 9. 37 Last Survey 20. 10. 1937
Reg. Book. (Number of Visits 10)

27002 on the s.s. "IRON KNIGHT."

Tons { Gross 4811.71
Net 2737.30

Built at Port Glasgow. By whom built Lithgow & Co. Yard No. 902 When built 1937

Owners Broken Hill Proprietary Co. Ltd. Port belonging to Melbourne.

Electric Light Installation fitted by W. Muir Goodfellows & Co. Ltd. Contract No. 902 When fitted 1937

Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution Two 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 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 Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing —

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 In 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 In Engine Room 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 Yes

is it of an approved type 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 Sindampo, 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. Circuit breakers with 1/2 trips for each generator. D.P. C/o switch & D.P. fuses for each outgoing circuit.

Are turbine driven generators fitted with emergency trip switch as per rule — Are cupboards or compartments containing switchboards composed of

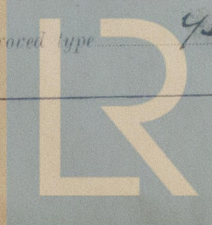
fire-resisting material or lined with approved material Yes Instruments on main switchboard 2 ammeters 2

voltage meters — 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

Earth Lamps 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



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current protection devices been tested under working conditions — **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, V, X or XI 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 *6.2 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 in machinery spaces, galleys, lavatories, bathrooms and lavatories lead covered or run in conduit *Yes*

Support and Protection of Cables, state how the cables are supported and protected *Mains, L.C.A. on perforated steel trays through linen deck spaces. Moulding space L.C.A. clipped. Accommodation L.C. clipped.*

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 *Yes*

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

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 *Armouring + lead sheathing of cables bonded together.*

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 —

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 *Yes in tween deck spaces. Fittings are of heavy metal with strong glasses. (Wigan Fittings)* 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 —, whether fixed or portable —, are their fittings as per Rule —

Are 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 when possible*, 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 —

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing — **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 fitted 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 type approved by the Home Office —

Spare Gear, if the vessel is for open sea service have spares been supplied as per Rule *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	1	90	220	404	500	Steam Engine.			
AUXILIARY	1	50	220	227	550	do do			
EMERGENCY									
ROTARY TRANSFORMER									

GENERATOR, LIGHTING AND HEATING CONDUCTORS.									
DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT. AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
	No. per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	Circuit.	Rate.			
MAIN GENERATOR	2	30	37	.072	404	444	60	Varn. Cambric	L. C. A.
EQUALISER CONNECTIONS									
AUXILIARY GENERATOR	1	20	37	.083	227	266	60	"	"
EMERGENCY GENERATOR									
ROTARY TRANSFORMER									
ENGINE ROOM SECTION BOX	1	.0225	7	.064	31	46	40	Rubber	L. C. A.
BOILER ROOM D.B.	1	.007	7	.036	18	24	50	"	"
AUXILIARY SWITCHBOARDS									
PANTRY GEAR. SALAMANDER	1	.007	7	.036	22.8	24	120	"	"
" STEAMER	1	.007	7	.036	13.7	24	120	"	"
" HOT PRESS.	1	.0145	7	.052	16.0	37	500	"	"
WELDING PLANT. (WIRING)	1	.04	19	.052	34	64	360	"	"
ACCOMMODATION ART. S.B.	1	.007	7	.036	14.1	24	80	"	"
NAVIGATION D.B.	1	.007	7	.036	3	24	600	"	"
MIDSHIP ACCOMMODATION S.B.	1	.007	7	.036	15	24	500	"	"
MOSQUITO ACCOM. GALLEY. REOOLYDA	1	.0225	7	.064	24.5	46	500	"	"
HOLD LIGHTS D.B.	1	.0225	7	.064	27	46	500	"	"
WIRELESS	1	.007	7	.036	15	24	600	"	"
SEARCHLIGHT									
MASTHEAD LIGHT	1	.002	3	.029	.18	7.8	280	"	L.C.A. + L.C.B.
SIDE LIGHTS	1	.002	3	.029	.18	7.8	100	"	L. C. B.
COMPASS LIGHTS	1	.002	3	.029	.10	7.8	25	"	L. C. B.
POOP LIGHTS									
CARGO LIGHTS									
ARC LAMPS									
HEADERS GALLEY RANGE	1	.20	37	.083	228	266	120	Varn. Cambric	L. C.
SHORE CONNECTION	1	.15	37	.072	200	222	200	" "	L. C.

MOTOR CONDUCTORS.										
DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT. AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
		No. Per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rate.			
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	2	1	.06	19	.064	81	83	200	Rubber.	L. C. A.
WORKSHOP MOTORS D.B.		1	.0225	7	.064	28	46	120	"	"
VENTILATING FANS D.B.		1	.0045	7	.029	10	18.2	30	"	"
LATHE MOTOR	1	1	.003	3	.036	9	12	20	"	"
DRILLING MACHINE MOTOR	1	1	.003	3	.036	7	12	20	"	"
GRINDER MOTOR	1	1	.0045	7	.029	12	18.2	20	"	"
THERMOTANK EXHAUST FAN	1	1	.0045	7	.029	11	18.2	120	"	"
DOMESTIC LEAKS. MACH. D.B.	1	1	.0145	7	.052	21	37	500	"	"

All Conductors are of annealed copper conforming to British Standard Specification No. 7 (or International Electro-technical Commission Publication No. 28).

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

The foregoing is a correct description.

FOR AND ON BEHALF OF

W. MUIR GOODFELLOW & CO. LTD.,

Electrical Engineers.

Date 19th Oct 1937

COMPASSES.

Distance between electric generators or motors and standard compass 190 feet

Distance between electric generators or motors and steering compass 190 feet.

The nearest cables to the compasses are as follows:—

A cable carrying 3 Amperes 10 feet from standard compass 6 feet from steering compass.

A cable carrying 18 Amperes 12 1/2 feet from standard compass 12 1/2 feet from steering compass.

A cable carrying Amperes 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 1/2 degrees on any course in the case of the standard compass, and 1/2 degrees on any course in the case of the steering compass.

LITHGOWS LIMITED.

John M. Fulloch Secretary

Builder's Signature.

Date 19/10/37

Is this installation a duplicate of a previous case No. If so, state name of vessel —

General Remarks (State quality of workmanship, opinions as to class, etc.) The electrical equipment of this

vessel has been fitted on board under special survey, tested under full working conditions and found satisfactory. The materials and workmanship are good.

23/10/37

W. L. Y.

28/10/37

Total Capacity of Generators 140 Kilowatts.

The amount of Fee ... £ 36: 10: 0 When applied for, at 1/2 p.c.

Travelling Expenses (if any) £ 3/6 When received, 30.10.37

W. L. Y. R. I. Trenchison. Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW 26 OCT 1937

Assigned SEE ACCOMPANYING MACHINERY REPORT



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