

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

8 JUL 1936

Date of writing Report 19 When handed in at Local Office 2/7/10<sup>36</sup> Port of **NEWCASTLE-ON-TYNE**

No. in Survey held at **Newcastle on Tyne**. Date, First Survey **17 April** Last Survey **19 May 1936**.

Reg. Book. Sub **S.S. "Mmtali"**  
40457 on the **S.S. "Mmtali"**

(Number of Visits.....5.....)

Tons { Gross 8158.11  
Net 5083.79

Built at **Newcastle**. By whom built **Swan Hunter & W.R. Co. Ltd.** Yard No. **1492** When built **1936**

Owners **Bullard King & Co. Ltd.** Port belonging to **London**

Electric Light Installation fitted by **Swan Hunter & Wigham Richardson** Contract No. **1492** When fitted **1936**.

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 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 **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 starboard side**, 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**

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 **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.C.B for each generator. SP-2 way switch with SP 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**

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 none. 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 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 4V for lighting, 6.5V for power 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 Yes, 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, laundries, bathrooms and lavatories lead covered or run in conduit lead covered.

Support and Protection of Cables, state how the cables are supported and protected L.C. & A in machinery spaces, L.C. in acc'd clipped to structure, L.C. & B to galv iron pipes along decks. If cables are run in wood casings, are the casings and caps secured by screws Yes, are the cap screws of brass Yes, are the cables run in separate grooves Yes. 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 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 rubber.

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 Boat deck emergency switchboard with C.O.S. for main & emergency dynamo. Emergency gen driven by Diesel engine

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 —

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 —, are all switches and lampholders constructed wholly of non-ignitable, non-absorbent materials —

Heating and Cooking Appliances, are they constructed and fitted as per Rule Yes, are air heaters constructed and fitted as per Rule Yes 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 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 Yes

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 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	Ampères	Revs. per Min.		Fuel Used	Flash Point of Fuel
MAIN	2	175	220	496	450	Steam engine		
AUXILIARY				490	450	Steam engine		
EMERGENCY	1	22	220	100		Diesel engine		
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	In Circuit	Rule			
MAIN GENERATOR	2	.8	61	.093	796	834	50	V.C.	L.C. & A.
EQUALISER CONNECTIONS	2	.8	6	.093	58	834	50	V.C.	L.C. & A.
AUXILIARY GENERATOR									
EMERGENCY GENERATOR	1	.2	19	.083	100	172	30	V.C.	L.C. & A.
ROTARY TRANSFORMER MOTOR GENERATOR	2	.2	19	.083	100	172	30	V.C.	L.C. & A.
ENGINE ROOM									
BOILER ROOM	1	.0045	7	.029	18	18.2	40	V.I.R.	L.C. & A.
AUXILIARY SWITCHBOARDS									
Passengers Heating	1	.8	61	.093	356	417	80	V.C.	L.C. & A.
Officers & Eng. Heating	1	.06	19	.064	74	83	80	V.I.R.	50
ACCOMMODATION	1	.06	19	.064	73	83	80	50	50
Officers, Eng. & Cabin	1	.04	19	.052	56	64	80	50	50
Emergency lighting	1	.0045	7	.029	14	18.2	30	50	L.C.
Navigation & Boat Deck	1	.007	7	.036	10	24	200	50	50
WIRELESS	1	.01	7	.044	15	31	160	50	50
SEARCHLIGHT									
MASTHEAD LIGHT	1	.002	3	.029	18	7.8	500	50	50
SIDE LIGHTS	1	.002	3	.029	18	7.8	100	50	50
COMPASS LIGHTS	1	.002	3	.029	18	7.8	50	50	50
STEER LIGHTS	1	.002	3	.029	18	7.8	220	50	50
CARGO LIGHTS	1	.01	7	.044	18.0	31.0	80	50	L.C. & A.
ARC LAMPS									
HEATERS									

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	Rule			
BALLAST PUMP										
MAIN BILGE LINE PUMPS										
GENERAL SERVICE PUMP										
EMERGENCY BILGE PUMP	1	1	.06	19	.064	75	83	260	V.I.R.	L.C. & A.
SANITARY PUMP										
CIRC. SEA WATER PUMPS										
CIRC. FRESH WATER PUMPS										
AIR COMPRESSOR										
HOT. FRESH WATER PUMP	1	1	.0045	7	.029	16	18.2	50	50	50
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										
WORKSHOP MOTOR	3	1	.002	3	.029	4	7.8	30	50	50
VENTILATING FANS	1	1	.0045	7	.029	14.5	18.2	100	50	50
Provision Refrig plants	2	1	.0045	7	.029	12.0	18.2	60	50	50
Drain pump	2	1	.01	19	.052	61	64	140	50	50
Hold cooler fan	1	1	.0045	7	.029	13.5	18.2	50	50	50
50	5	1	.0225	7	.064	40	46	440	50	L.C. & A.
50	5	1	.0225	7	.064	34	46	440	50	50

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  
**SWAN, HUNTER, & WIGHAM RICHARDSON, LTD.**

Electrical Engineers.

Date 9<sup>th</sup> June 36.

COMPASSES.

Distance between electric generators or motors and standard compass 130 feet

Distance between electric generators or motors and steering compass 125 feet

The nearest cables to the compasses are as follows:—

A cable carrying .07 Ampères in feet from standard compass in feet from steering compass.

A cable carrying .18 Ampères 5 feet from standard compass 5 feet from steering compass.

A cable carrying .18 Ampères 8 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 The following will be filed in after sea trial.

Has the effect of switching on and off circuits, motors and other electro-magnetic apparatus within the vicinity of the compasses been noted Yes W.T.B.

The maximum deviation due to electric currents was found to be nil degrees on all course in the case of the standard

compass, and nil degrees on all course in the case of the steering compass.

SWAN, HUNTER & WIGHAM RICHARDSON, LTD

G. J. Street  
DIRECTOR

Builder's Signature.

Date 10<sup>th</sup> June 1936

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

General Remarks (State quality of workmanship, opinions as to class, &c. The above inst<sup>n</sup> has been fitted out under special survey. The workmanship & materials used were good. On completion the dynamo, governor, main board fuses cables & fittings examined & tested under working conditions & found satisfactory. The insulation resistance found good. The result is dignified in my opinion for rotation. D.F.

Noted  
Ym  
10.7.36

Total Capacity of Generators 372 Kilowatts.

The amount of Fee ... £ 51:2 : 27 JUL 1936

Travelling Expenses (if any) £ : : 11.7 31/11

Committee's Minute FRI. 10 JUL 1936

Assigned See other h/wc. J.C.  
93942

W.T. Badger  
Surveyor to Lloyd's Register of Shipping.

2m.534.—Transfer.  
The Surveyors are requested not to write on or below the space for Committee's Minute.