

# REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

24 DEC 1930

Date of writing Report 29<sup>th</sup> November 1930 When handed in at Local Office

10 Port of SHANGHAI

No. in Survey held at SHANGHAI

Date, First Survey 15<sup>th</sup> September Last Survey 26<sup>th</sup> November 1930

Reg. Book.

(Number of Visits 12)

on the STEEL TWIN SCREW STEAMER "PAO WO"

Tons { Gross 2517  
Net 1494

Built at SHANGHAI

By whom built SHANGHAI DOCK &amp; ENG. CO. LD. Yard No. 1784

When built 1930

Owners INDO-CHINA STEAM NAVIGATION CO. LTD. Port belonging to SHANGHAI

Electric Light Installation fitted by SHANGHAI DOCK &amp; ENG. CO. LD.

Contract No.

When fitted 1930

System of Distribution DOUBLE WIRING

Pressure of supply for Lighting 110 volts, Heating 110 volts, Power 110 (FANS) volts.

Direct or Alternating Current, Lighting DIRECT Power

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 rating 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 ✓

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 MAIN 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 MAIN 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, 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 ✓

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, proportion of omnibus

bars YES, individual fuses to voltmeter, pilot or earth lamp YES, connections of switches YES

Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches

DOUBLE POLE, KNIFE PATTERN SWITCHES AND DOUBLE POLE FUSES FOR EACH GENERATOR

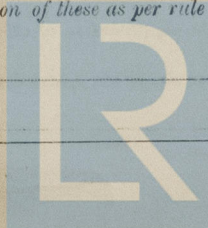
AND OUT GOING CIRCUIT

Instruments on main switchboard 2 ammeters 2 voltmeters ✓ synchronising device for paralleling purposes.

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

Joint Boxes Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule YES



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Cables: Single, twin, concentric, or multicore SINGLE & TWIN are the cables insulated and protected as per Tables IV or V of the Rules. YES

Fall of Pressure, state maximum between bus bars and any point of the installation under maximum load 4 VOLTS

Cable Sockets and other connections, are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets YES

Paper Insulated Cables. If cables are paper covered, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound ✓ NO PAPER COVERED CABLE USED

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

Support and Protection of Cables, state how the cables are supported and protected BRASS CLIPS & SCREWS

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 ✓ If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VIII YES

Refrigerated Chambers, if lights are fitted, are the cables and fittings in accordance with the special requirements ✓

Joints in Cables, state if any, and how made, insulated, and protected ✓

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 ?  
RED PLATES BOLTED TO SHIP HULL

, 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 LEAD SHEATHING AND SHEET METAL

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 ✓

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 VERTICAL

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 ✓

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 YES

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 ✓

If portable lamps for use in dangerous spaces are supplied, are they of a type approved by the Home Office ✓

## 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	15	110	136	700	TANDEM COMPOUND		
AUXILIARY	✓					STEAM ENGINE		
EMERGENCY	✓							
ROTARY TRANSFORMER								

## LIGHTING AND HEATING CONDUCTORS.

Ref. No.	DESCRIPTION.	No. of Conductors.	Effective Area of each Conductor. Sq. Ins.	COMPOSITION OF STRAND.		Total Maximum Current. Ampères.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
	MAIN GENERATOR...	2	0.200	37	.083	126.5	30 Ft.	V. I. R.	LEAD SHEATHED
	EQUALISER CONNECTIONS								
	AUXILIARY GENERATOR								
	EMERGENCY GENERATOR								
	ROTARY TRANSFORMER...								
	AUXILIARY SWITCHBOARDS								
	ENGINE ROOM	2	0.01	7	.044	12.10	50 Ft.	"	"
	BOILER ROOM	3							
	ACCOMMODATION								
	ENGINEERS & OFFICERS	2	0.01	7	.044	8.0	260 Ft.	"	"
	1ST CLASS	2	0.01	7	.044	16.4	380 Ft.	"	"
	INTERMEDIATE	2	0.03	19	.044	29.9	320 Ft.	"	"
	2ND CLASS	2	0.03	19	.044	22.8	50 Ft.	"	"
	NAVIGATION	2	0.01	7	.044	6.0	450 Ft.	"	"
	FANS	2	0.01	7	.044	12.8	230 Ft.	"	"
	WIRELESS								
	SEARCHLIGHT								
	MASTHEAD LIGHT	2	0.0015	1	.044	.5	130 Ft.	"	"
	SIDE LIGHTS	2	0.0015	1	.044	.5	50 Ft.	"	"
	COMPASS LIGHTS	2	0.0015	1	.044	.5	40 Ft.	"	"
	POOP LIGHTS	2	0.0015	1	.044	.5	200 Ft.	"	"
	CARGO LIGHTS	2	0.03	19	.044	17.3	140 Ft.	"	"
	ARC LAMPS								
	HEATERS	2	0.0225	7	.064	16.0	350 Ft.	"	"

## MOTOR CONDUCTORS.

Ref. No.	DESCRIPTION.	No. of Motors.	Effective Area of each Conductor. Sq. Ins.	COMPOSITION OF STRAND.		Total Maximum Current. Ampères.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
	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								
	WORKSHOP MOTOR								
	VENTILATING FANS								



All Conductors are of annealed copper conforming to British Standard Specification No. 7.  
The Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules.  
The foregoing is a correct description.

THE SHANGHAI DOCK & ENGINEERING CO., LTD.

Electrical Engineers.

Date 26<sup>th</sup> NOVEMBER 1930

*W. S. Burn*

Managing Director

#### COMPASSES.

Distance between electric generators ~~and~~ and standard compass 200 FEET

Distance between electric generators ~~and~~ and steering compass 200 FEET

The nearest cables to the compasses are as follows:—

A cable carrying 55 Amperes 18 feet from standard compass 12 feet from steering compass.

A cable carrying 5 Amperes 8 feet from standard compass 8 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

The maximum deviation due to electric currents was found to be ✓ degrees on ✓ course in the case of the standard compass, and ✓ degrees on ✓ course in the case of the steering compass.

THE SHANGHAI DOCK & ENGINEERING CO., LTD.

Builder's Signature.

Date 26<sup>th</sup> NOVEMBER 1930

*W. S. Burn*

Managing Director

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, &c.)

THIS VESSEL'S ELECTRIC LIGHT INSTALLATION HAS BEEN FITTED IN ACCORDANCE WITH THE RULES AND THE MATERIALS AND WORKMANSHIP FOUND GOOD. THE INSTALLATION TESTED UNDER FULL WORKING CONDITIONS AND FOUND SATISFACTORY.

It is submitted that  
this is suitable for  
THE RECORD.

*Elec Light*

*SA 6/1/31*

Total Capacity of Generators 2 FT 15 = 30 Kilowatts.

The amount of Fee ... *\$330<sup>00</sup>* : When applied for, 27-11-1930  
Travelling Expenses (if any) £ : : When received, 29-11-1930

*J. Brooke Smith*  
Surveyor to Lloyd's Register of Shipping.

Committee's Minute

FRI. 9 JAN 1931

*Elec. Lt.*

Assigned

1m.127.—Transfer.  
(The Surveyors are requested not to write on or below the space for Committee's Minute.)



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