

## REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office.....

14 NOV 1944

Date of writing Report... 20-Oct. 44. When handed in at Local Office... 31-Oct. 44. Port of... Belfast

No. in Survey held at... Belfast. Date, First Survey... 28 Oct 1943 Last Survey... 30-Oct. 1944.  
Reg. Book. (Number of Visits... 40)87510 on the... Twin Screw Motor Vessel "Waiwera" Tons { Gross... 12700  
Net... 8830

Built at... Belfast By whom built... Harland &amp; Wolff Ltd Yard No... 1161 When built... 1943/4

Owners... Shaw Savill &amp; Albion Co Ltd Port belonging to... Southampton

Electrical Installation fitted by... Messrs Harland &amp; Wolff Ltd Contract No... 1161 When fitted... 1944

Is vessel fitted for carrying Petroleum in bulk... No Is vessel equipped with D.F... Yes E.S.D... Yes Gy.C... Yes Sub.Sig... -

Have plans been submitted and approved... Yes System of Distribution... Two Wire Voltage of supply for Lighting... 220

Heating... 220 Power... 220 Direct or Alternating Current, Lighting... D.C. Power... D.C. 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... Yes, 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... Yes 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... Main generators in Motor Room Port &amp; Starboard

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... At Platform after end of Motor Room

Auxiliary Switchboard in Auxiliary generator Room, Shelter Deck

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... Sindanyo, 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 equaliser switches... 1500 amp Double Pole

of Circuit Breakers with Reverse Current Trip on Positive Pole only. Time Limits on

both Poles. M.B.D. with Auxiliary Switch to operate Breaker. Triple Pole Main Switch

(over-voltage, equaliser) Circuits 200 amps and over:- D.P. Circuit Breakers with O/L Release.

M.B.D. with Time Limits. Circuits under 200 amp. D.P. Knife Switches with Fuse on each Pole.

Are compartments containing switchboards composed of fire-resisting material or lined as per Rule... Yes Instruments on main switchboard... 4

ammeters... 2 voltmeters... - synchronising devices. For compound machines in parallel is the ammeter connected on the pole opposite to the

equaliser connection... Yes Earth Testing, state means provided... "Earth Indicating" Lamps

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... Full load, are the reversed current

protection devices connected on the pole opposite to the equaliser connection... Yes, have they been tested under working conditions, and at what current

did they operate... 10% Joint Boxes, Section Boards and Distribution Boards, is the construction and position as per Rule... Yes

Cables, 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... 7.5 Volts 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. Yes, if so, are they adequately protected. Yes. Are cables in machinery spaces, galleys, laundries, etc., lead covered. Yes. State how the cables are supported and protected. Varnished Cambric, Lead Covered & Hard Rubber cables clipped to plating throughout accommodation and motor room. Cables in pipes and troughing along open decks. Solid protected plating through cargo spaces.

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 effectively bushed. Yes, and with what material. Sheet Lead. Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule. Yes. Emergency Supply, state position. Aux. Generator Room on Shelter Deck (not fitted at present) and method of control. Switchboard in Aux. Generator Room.

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. Yes, are they adequately ventilated. Yes what is the battery capacity in ampere hours. 24 volt batteries - 51 A.H. 12 volt batteries - 95 A.H.

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. Flameproof guarded pendants in Lamp & Paint Rooms. Flameproof Fittings in Magazines. and where are the controlling switches fitted. Locally, are all fittings suitably ventilated. Yes, are all fittings and accessories constructed and installed as per Rule. Yes. Searchlight Lamps, No. of —, whether fixed or portable. —, are their fittings as per Rule. —. Heating and Cooking, is the general construction as per Rule. Yes, are the frames effectually earthed. Yes, 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. Yes. 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. Yes. Control Gear and Resistances, are they constructed and fitted as per Rule. Yes. Lightning Conductors, where required are they fitted as per Rule. —. 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. —, are all fuses of the cartridge type. —. Are the fittings for pump rooms, 'tween deck spaces, etc., in accordance with the special requirements for such ships. —. Are the cables lead covered as per Rule. —. 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				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN ...	4	300	222	1350	340	6 cyl. Diesel Engine	Pool Diesel	above 150° F
EMERGENCY ...								
ROTARY TRANSFORMER								

#### 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 ...	300	3	61/093	1350	1392	68	V.C.	Lead Covered
" " EQUALISER ...		2	61/093	—	928	68	V.C.	"
EMERGENCY GENERATOR ...								
ROTARY TRANSFORMER: MOTOR								
" " GENERATOR ...								

Rpt. 9a.

Port of Belfast

Continuation of Report No.

dated

on the

#### Main Distribution Cables (contd.)

Description	Conductors.		Max. Current in Amperes		Approx. Length. Lead + Return Ft.	Insulated With	How Protected.
	No. in Parallel per pole	No. & Dia. of Strands Sq. ins.					
Refinery Panel No.1.	1	19/083	116	191	360	V.C.	Lead Covered.
" " N°2.	1	37/072	161	246	220	"	"
" " N°3	1	19/083	156	191	300	"	"
S & F. Box N°26 Motor Rm. Ventn., etc.	1	19/052	54	64	140	Rubber	Hard Rubber.
" " N°27 Workshop M/C.	1	7/052	30	37	80	"	"
N°28 Motor Room Aux.	1	19/064	77	93	260	"	"
N°29 " " "	1	19/064	57	93	140	"	"
Emergency Switchboard	2	37/072	273	492	210	V.C.	Lead Covered.

#### Lighting & Heating etc., Cables (contd.)

Dist Box N°19 Cargo Lighting Aft	1	7/052	14	37	450	Rubber	Hard Rubber.
" " 20 Aft Lighting	1	7/052	10	37	570	"	"
" " 21 " "	1	7/052	10	37	80	"	"
" " 22 Motor Room Lighting	1	7/064	16	46	40	"	"
" " 23 " " "	1	7/064	13	46	35	"	"
" " 24 " " "	1	7/064	15	46	40	"	"
" " 25 " " "	1	7/064	18	46	35	"	"

#### Motor Cables (contd.)

25" Refrig Fans	N° 10	B.H.P. 4	1	7/036	16	24	140	Rubber	Hard Rubber
30" " "	8	6 3/4	1	7/044	28	31	120	"	"
35" " "	5	8	1	7/064	36	46	80	"	"
Refrig Space Vent Fan	1	3	1	7/029	12.8	15	100	"	"
Veg. Room Fan.	1	1/3	1	3/029	2	5	20	"	"
Brine Pumps.	3	16	1	19/052	62	64	120	"	"
Plunger Brine Pump.	1	3 3/4	1	7/036	16	24	120	"	"



## MAIN DISTRIBUTION CABLES.

DESCRIPTION.	CONDUCTORS.		MAXIMUM C. IN AMPE
	No. in Parallel Per Pole.	Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm.	
AUX. SWITCHBOARDS AND SECTION BOARDS ...			
Masterboard "A" Lighting	1	19/064	57
" " "A" Domestic	1	19/083	69
" " "A" Thermotanks	1	19/083	60
" " "B" Lighting	1	19/064	38
" " "B" Domestic	1	19/083	7
" " "B" Thermotanks	1	19/083	
" " "B" Winches	1	61/093	
" " "C" Winches	1	61/093	
" " "D" Winches	1	91/093	
" " "E" Refrig	2	61/103	
" " "F" Winches	2	37/093	
" " "F" Thermotanks	1	19/064	
" " "G" Winches	2	37/093	55

## LIGHTING AND HEATING, ETC., CABLES.

WIRELESS ETC. ....	1	19/083	52	191	
NAVIGATION LIGHTS ...	1	3/029	0.2	5	16
LIGHTING AND HEATING ...					
S&F Box No 1 Navigation, etc	1	7/064	17	46	37
Dist Box No 2 Officers Accommodation Lighting	1	7/064	4	46	40
" " 4 Boat Deck Ford	1	7/036	7	24	150
" " 5 Bridge Deck Pt. Ford	1	7/052	12	37	80
" " 6 Mess Room Pantry Domestic	1	19/064	69	83	80
" " 7 Bridge Deck Stair Ford Lighting	1	7/052	10	37	80
" " 9 Cargo Lighting Midships	1	7/052	10	37	110
" " 10 Engineers Accommodation Lighting	1	7/044	8	31	55
" " 11 " " "	1	7/044	9	31	70
" " 12 " " "	1	7/044	10	31	150
" " 13 " " Domestic	1	7/052	31	37	200
" " 14 " " Lighting	1	7/044	11	31	150
" " 15 Forecastle	1	7/064	30	46	420
" " 16 Ford Cargo Lighting	1	7/052	14	37	410

## MOTOR CABLES.

ALL IMPORTANT MOTORS TO BE ENUMERATED.	No.	B.H.P.							
Air Compressors	2	100	1	61/093	380	464	375	V.C.	Lead Covered
C.O.2. Compressors	3	160	1	91/093	600	624	220	"	"
Lub. Oil Pumps	3	100	1	61/093	373	464	210	"	"
Bidge Pumps	2	13 1/2	1	19/052	51	64	220	Rubber	Hard Rubber
Main F.W. Pumps	2	26	1	19/083	100	191	310	V.C.	Lead Covered
Main S.W. Pumps	3	36	1	19/083	137	191	300	"	"
Sanitary Pump	1	26	1	19/083	100	191	200	"	"
General Service Pump	1	26	1	19/083	100	191	200	"	"
Fuel Oil Transfer Pumps	2	12	1	19/044	47	53	140	Rubber	Hard Rubber
Ballast Pump	1	26	1	19/083	100	191	275	V.C.	Lead Covered
Refrig S.W. Circ. Pumps	2	26	1	19/083	100	191	275	"	"
Motor Room Vent Fans	4	1 3/4	1	7/029	8	15	285	Rubber	Hard Rubber
6 ton Hoists. Motor Room	2	5	1	7/044	21	31	100	"	"
Aux. S.W. Circ. Pump	1	8	1	7/044	31	31	50	"	"
Aux. F.W. Circ. Pump	1	5	1	7/036	21	24	50	"	"
Domestic F.W. Pump	1	7	1	7/052	28	37	270	"	"
Vapour Extraction Fans	2	4 1/2	1	7/036	19	24	250	"	"
Boiler Blower	1	2	1	7/029	8	15	150	"	"
Boiler Feed Pump	1	2 1/2	1	7/029	10.8	15	150	"	"
Oil Purifiers	4	3	1	7/029	13	15	80	"	"
Purified F.O. Pump	1	1 3/4	1	7/029	8	15	80	"	"
Steering Gear Motors	2	60	1	37/103	230	385	600	V.C.	Lead Covered
Motor Room Vent Fan	1	2 1/2	1	7/029	11	15	270	Rubber	Hard Rubber
Hot S.W. Pump	1	4	1	7/036	17	24	30	"	"
Steering Gear Vent Fan	1	1/3	1	3/029	2	5	120	"	"
Windlass	1	77	1	61/093	293	464	240	V.C.	Lead Covered
Winches	19	57	1	37/072	222	246	130	"	"



once with the approved plans and the requirements of the Rules.

been tested at the maker's works as specified in the Rules.



Electrical Engineers.

Date Oct 27th 1944.

27 feet from Hypo Compass Motor Generator  
22 feet from Hypo Compass Motor Generator

Standard compass 10 feet from steering compass.

From standard compass in feet from steering compass.

feet from standard compass 8 feet from steering compass.

At the electric installation at work at full power Yes and calibrated with D. G. "on" & "off"

Motors and other electro-magnetic apparatus within the vicinity of the compasses been noted yes.

It was found to be no any course in the case of the

Agrees on any course in the case of the steering compass.



Builder's Signature.

Date 30.10.44

Date of a previous case no If so, state name of vessel

Forwarded herewith no If not, state date of approval 10-9-43.

Certificates of test for motors engaged on essential services and generators forwarded herewith yes.

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

Noted

HR

23.11.44

Total Capacity of Generators 1200 Kilowatts.

The amount of Fee 4/3 Bk. 160. 75 : - : 11/11. 1944

Travelling Expenses (LONDON) £ 1 : 5/6 : When received. 1944

R. S. Hurchison

Surveyor to Lloyd's Register of Shipping.

FRI. 1 DEC 1944

Committee's Minute

Assigned

see minute on H. R. Pl.