

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office 30 JUN 1941

Date of writing Report 26th June 1941. When handed in at Local Office 28th June 1941. Port of Leith

No. in Survey held at Leith Reg. Book. Date, First Survey 10th Feb^y Last Survey 19th June 1941 (Number of Visits 20)

90402 on the M/V "UNDERWOOD" Tons { Gross 1990 Net 1359

Built at Leith By whom built Henry Robb Ltd Yard No. 291 When built 1941

Owners Union Steamships Co of New Zealand Port belonging to London

Electrical Installation fitted by Henry Robb Ltd Contract No. v When fitted 1941

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

Have plans been submitted and approved yes System of Distribution Two wire Voltage of supply for Lighting 220

Heating Power 220 Direct or Alternating Current, Lighting DC Power DC 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 yes

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 Engine Room - Forward - 1-100kw Port, 1-100kw Star, 1-20kw Centre

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 Forward end of Engine Room - Port

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 Sindamya 3/4" thick, 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 yes 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 Of Statters Manufacture for 100kw Gen? 500 Amp Capacity For 20kw Machines 100 Amp Capacity D.P. switches with 1/2 Reverse current trips & time lag interlocked Equaliser switch, closes before main contacts, opens after main contacts

and for each outgoing circuit D.P. & T Knife Switches & fuses 2-500 Amp 3-150 Amp 1-100 Amp 1-50 Amp 2-30 Amp 1-30 Amp D.P.C.O. & D.P. fuses for lighting 1-30 Amp 4 Pole C.O. Switch for Batteries & A.C. Cut in/out

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

ammeters yes 4 voltmeters yes 4 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 Lamps in series across bus bars Centre point earthed

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

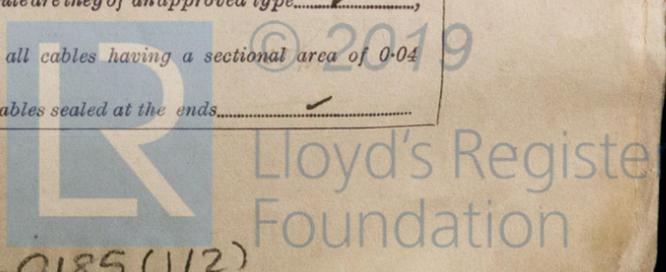
If circuit breakers are provided for the generators, at what overload current did they open when tested 10% are the reversed current protection devices connected on the pole opposite to the equaliser connection yes

have they been tested under working conditions, and at what current did they operate 20% 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 yes

state maximum fall of pressure between bus bars and any point under maximum load 4.5 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 . 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 are cables laid under machines or floorplates if so, are they adequately protected . Are cables in machinery spaces, galleys, laundries, etc., lead covered or run in conduit . State how the cables are supported and protected V.I.R cables in conduit throughout.

Are all lead sheaths, armouring and conduits effectually bonded and earthed . Refrigerated chambers, are the cables and fittings as per Rule . Are all cables passing through decks and watertight bulkheads provided with deck tubes or watertight glands where unarmoured cables pass through beams, etc., are the holes effectually bushed and with what material . Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule . Emergency Supply, state position and method of control .

Navigation Lamps, are they separately wired controlled by separate double pole switches and fuses . Are the switches and fuses in a position accessible only to the officers on watch is an automatic indicator fitted . Secondary Batteries, are they constructed and fitted as per Rule are they adequately ventilated what is the battery capacity in ampere hours 61.

Fittings, are all fittings on weather decks, in stokeholds and engine rooms and wherever exposed to drip or condensed moisture, weatherproof . Are fittings installed where readily combustible materials or inflammable or explosive dust or gases are likely to be present if so, how are they protected .

and where are the controlling switches fitted are all fittings suitably ventilated are all fittings and accessories constructed and installed as per Rule . Searchlight Lamps, No. of whether fixed or portable are their fittings as per Rule .

Heating and Cooking, is the general construction as per Rule are the frames effectually earthed are heaters in the accommodation of the convection type . Motors, are all motors constructed and installed as per Rule and placed in well-ventilated compartments in which inflammable gases cannot accumulate and free from damage from water, steam and oil 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 . Have motors of 100 BHP and over been inspected by the Surveyors during manufacture and testing . Have certificates of test for motors under 100 BHP intended for essential services been supplied and the results found as per Rule . Control Gear and Resistances, are they constructed and fitted as per Rule . Lighting 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 are they suitably stored in dry situations . Insulation Tests, has the insulation resistance of all circuits and apparatus been tested and found satisfactory .

PARTICULARS OF GENERATING PLANT.

DESCRIPTION OF GENERATOR.	No. of	RATED AT			Revs. per Min.	DRIVEN BY		WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.		Fuel Used.	Flash Point of Fuel.		
MAIN	2	100 each	220	455	600	Ruston Hornby Diesel Engo. } Emergency Rate of 21227	Diesel oil	Above 120° F	
	1	20	220	91	1000	Ruston Hornby Diesel Engo. } Emergency Rate of 21227	"	"	
	1	20	220	91	1000	Belt driven from shaft	"	"	
EMERGENCY									
ROTARY TRANSFORMER									

GENERATOR CABLES.

DESCRIPTION.	KILOWATTS.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (load 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	100	2	37/103	455	480	45ft.	V.I.R.	In conduit
" " EQUALISER		1	37/103			23ft.	"	"
Generator	20	1	19/072	91	97	30ft.	V.I.R.	In conduit
" Equaliser		1	19/044			15ft.	"	"
EMERGENCY GENERATOR								
ROTARY TRANSFORMER: MOTOR								
" " GENERATOR								

MAIN DISTRIBUTION CABLES.

DESCRIPTION.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (load 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.			
AUX. SWITCHBOARDS AND SECTION BOARDS							
Midships Winches - 4 way	1	19/072	102	113	270	V.I.R.	In conduit
Small auxiliaries - 6 way	1	19/083	110	118	50	"	"
do - 8 way	1	7/064	26	46	100	"	"
Lighting S.B. - 4 way	1	7/036	24	24	54	"	"
Windlass	1	19/083	122	124	460	"	"
Hoisting & Sluicing Winches	2	37/072	260	304	290 foot 120 ft.	"	"
Hoisting Winches	2	37/072	226	304	do.	"	"
Capstan	1	19/072	103	113	160	"	"
Air Compressor	1	19/052	63	64	100	"	"
Steering Gear	1	7/064	21	46	30	"	"

From Main Switchboard

LIGHTING AND HEATING, ETC., CABLES.

WIRELESS	1	7/044	15	31	50	V.I.R.	In conduit
NAVIGATION LIGHTS	1	3/029	2	5	90	"	"
LIGHTING AND HEATING							
Lighting S.B. to Navigation Board	1	3/029	2	5	90	"	"
S.B. Lighting D.B.	1	7/029	5.5	10	8	"	"
Accommodation Lighting D.B.	1	7/029	9	10	40	"	"
"	1	7/029	7.5	10	50	"	"

MOTOR CABLES.

ALL IMPORTANT MOTORS TO BE ENUMERATED.	No.	B.H.P.						
Midships Cargo Winches	4	16	1	19/052	63	64	20	V.I.R. In conduit
Windlass	1	32	1	19/083	122	124	20	"
Hoist Motor Winches	2	66	2	37/072	246	304	60	"
Sluicing Motor Winches	2	10.5	1	7/064	42	46	60	"
Hoisting Winch	2	66	2	37/072	246	304	60	"
Bridge Pump	1	7.5	1	7/044	30	31	40	"
General Service Pump	1	7.5	1	7/044	30	31	36	"
Standby Lub. Oil Pump	1	4.5	1	7/036	19	24	30	"
Fresh Water Pump	1	1	1	3/029	5	5	15	"
Fuel Oil Transfer Pump	1	1.25	1	3/036	6	10	35	"
Fuel Oil Pumps	1	2	1	3/036	9	10	15	"
Refrigerator	1	1	1	3/036	5	10	10	"
Capstan	1	27	1	19/072	103	113	6	"
Steering Gear	1	5	1	7/064	21	46	135	"
Air Compressor	1	16	1	19/052	63	64	12	"

From Controller D.B.'s

The Electrical Equipment is installed in accordance with the approved plans and the requirements of the Rules.
 All Insulated Conductors are guaranteed to have been tested at the maker's works as specified in the Rules.
 The foregoing is a correct description.

HENRY ROBB, LIMITED.

J. Ashcroft

Electrical Engineers.

Date *26 June 1941.*

COMPASSES.

Minimum distance between electric generators or motors and standard compass..... *33 ft.*

Minimum distance between electric generators or motors and steering compass..... *25 ft.*

The nearest cables to the compasses are as follows:—

A cable carrying *.07* Ampères *on* feet from standard compass *8* feet from steering compass. } *Compasses equipped with 15 watt lamps + corrector coils.*
 A cable carrying *.07* Ampères *8* feet from standard compass *on* 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 *all* course in the case of the standard compass, and *nil* degrees on *all* course in the case of the steering compass.

HENRY ROBB, LIMITED.

J. Ashcroft

Builder's Signature.

Date *26 June 1941*

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

Plans. Are approved plans forwarded herewith..... *yes* If not, state date of approval.....

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

General Remarks (State quality of workmanship, whether insulation tests, etc., have been made, opinions as to class, etc.).....

The Diesel-driven generators - Girdley Rpts Nos 21233 + 21237 - have been efficiently fitted in place, in accordance with the Rules, the material & workmanship being sound & good. A belt driven auxiliary generator has also been efficiently fitted on board. The wiring of the vessel has been carried out in a satisfactory manner, & in accordance with the approved plans. On completion the whole installation was tried out under full load & working conditions, & it was found satisfactory in all respects.

Total Capacity of Generators..... *240* Kilowatts.

The amount of Fee £ *44:10* : When applied for, *28/6/1941*
2th 4/3-12 = £35-12-0
8th 1/6-12 = £ 8-18-0
 Travelling Expenses (if any) £ : : When received, 19.....

John Houston
 Surveyor to Lloyd's Register of Shipping.

FRI. 11 JUL 1941

Committee's Minute

Assigned..... *See Lth. J.E. 20437*

5m. 4.30. Transfer. (MADE AND PRINTED IN ENGLAND.) (The Surveyors are requested not to write on or below the space for Committee's Minute.)

