

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Date of writing Report 24<sup>th</sup> MARCH 1948

When handed in at Local Office 20 APR 1948

Received at London Office 17 MAY 1948

Port of NEWCASTLE-ON-TYNE

No. in Survey held at B.L.T.H.  
Reg. Book.

Date, First Survey 23/10/47

Last Survey 24/8/48

(Number of Visits.....)

36407 on the M.V. "AROS"

Tons { Gross 3762  
Net 2182

Built at B.L.T.H.

By whom built B.L.T.H. D.D. &amp; S.B. Co.

Yard No. 334

When built 1947/8

Owners REDERI A/B HELSINGBORG.

Port belonging to HELSINGBORG.

Electrical Installation fitted by CLARKE CHAPMAN &amp; Co. LTD.

Contract No. - When fitted 1947/8

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 - INSULATED

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 IN ENGINE ROOM

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. NEAR GENERATORS

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. INTEROHM, 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 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. 150KW GENERATORS - 800

IMPERE TRIPLE POLE CIRCUIT BREAKER WITH 2 OVERLOAD RELAYS WITH TIME LAGS, UNDERVOLTAGE RELAY AND REVERSE CURRENT RELEASE. 10KW GENERATOR - DOUBLE POLE QUICK BREAK SWITCH WITH A FUSE ON EACH POLE.

and for each outgoing circuit. DOUBLE POLE QUICK BREAK SWITCH WITH A FUSE ON EACH POLE.

re compartments containing switchboards composed of fire-resisting material or lined as per Rule. YES Instruments on main switchboard FOUR

meters FOUR. 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 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. 120% FL, 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 they operate. YES/10% FL.

Joint Boxes, Section Boards and Distribution Boards, is the construction and position as per Rule. YES, 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. -

e maximum fall of pressure between bus bars and any point under maximum load. &lt; 8VARS, are the ends of all cables having a sectional area of 0.04

Shipped are 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 or run in conduit. —. State how the cables are supported and protected. MAIN CABLES - LEAD COVERED ARMOURD & BRAIDED CLIPPED TO STEEL TRAY.

ENGINE ROOM LIGHTING CABLES - V.I.R. IN CONDUIT.

ACCOMMODATION CABLES - LEAD COVERED CLIPPED TO WOOD GROUNDS.

Are all lead sheaths, armouring and conduits effectually bonded and earthed. YES. 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. YES, where unarmoured cables pass through beams, etc., are the holes effectively bushed. YES and with what material. LEAD. Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule. YES. Emergency Supply, state position. ENGINE ROOM - PORT SIDE OF ENGINE TOPS. and method of control. HAND START

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. —, are they adequately ventilated. — what is the battery capacity in ampere hours. —

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. NO, if so, how are they protected. —

and where are the controlling switches fitted. —, 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. YES. 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. —. 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. YES. 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 they of an approved 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 ...	3	150	220	682	500	DIESEL ENGINE	OIL	ABOVE 150° FLASH.
EMERGENCY ...	1	10	220	45.5	1000	DIESEL ENGINE	OIL	ABOVE 150° FLASH.
ROTARY TRANSFORMER								

#### GENERATOR CABLES.

DESCRIPTION.	KILOWATTS.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus return feet).	INSULATED WITH.	HOW PROTECTED.
		No. in Parallel For Pole.	Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm.	In the Circuit.	Rule.			
MAIN GENERATOR ...	150	1	91-103	682	738	120	V.C.	L.C.+B.
" " EQUALISER ...		1	37-103.	341	385	60	V.C.	L.C.+B.
EMERGENCY GENERATOR ...	10	1	19-044	45.5	84	150	V.C.	L.C.+B.
ROTARY TRANSFORMER: MOTOR								
" " GENERATOR								

#### MAIN DISTRIBUTION CABLES.

DESCRIPTION.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus return feet).	INSULATED WITH.	HOW PROTECTED.
	No. in Parallel For Pole.	Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm.	In the Circuit.	Rule.			
AUX. SWITCHBOARDS AND SECTION BOARDS ...	1	19-083	109	118	60	V.I.R.	L.C.+B.
REFRIGERATOR CONTROL PANEL	1	19-083	150	191	300	V.C.	L.C.A.+B.
FORWARD WINCH PANEL	1	37-103	217	385	390	V.C.	L.C.A.+B.
AFT WINCH PANEL	1	37-083	281	296	390	V.C.	L.C.A.+B.
MIDSHIP HEATING SECT. BOX NO. 3	1	19-083	150	191	186	V.C.	L.C.A.+B.
MIDSHIP HEATING MAIN DECK. D.B. 11.	1	7-052	52.34	54	6	V.C.	L.C.+B.
MIDSHIP HEATING BRIDGE DECK. D.B. 12.	1	19-052	79.04	104	60	V.C.	L.C.+B.
GALLEY EQUIPMENT.	1	19-064	90	125	120	V.C.	L.C.A.+B.
MIDSHIPS LIGHTING SECT. BOX NO. 2.	1	19-044	83.4	84	186	V.C.	L.C.A.+B.
RADAR.	1	7-052	15	34	200	V.I.R.	L.C.A.+B.

#### LIGHTING AND HEATING, ETC., CABLES.

WIRELESS ...	1	7-052	20	27	240	V.I.R.	L.C.A.+B.
NAVIGATION LIGHTS ... D.B. 14.	1	7-026	12	24	240	V.I.R.	L.C.A.+B.
LIGHTING AND HEATING CARGO LTA. FWD. D.B. 9.	1	7-029	894	15	354	V.I.R.	L.C.A.+B.
CARGO LIGHTING. D.B. 10.	1	7-029	5	15	300	V.I.R.	L.C.A.+B.
CARGO LIGHTING. D.B. 8.	1	7-044	10.58	31	296	V.I.R.	L.C.A.+B.
MIDSHIP LIGHTING MAIN DECK PORT. D.B. 1.	1	7-029	694	15	6	V.I.R.	L.C.
MIDSHIP LIGHTING MAIN DECK STAR. D.B. 2.	1	3-026	708	10	99	V.I.R.	L.C.
MIDSHIP LIGHTING BRIDGE DECK PORT. D.B. 3.	1	7-026	22.6	24	60	V.I.R.	L.C.
MIDSHIP LIGHTING BRIDGE DECK STAR. D.B. 4.	1	7-029	12.9	15	120	V.I.R.	L.C.
AFT ACCOMMODATION LTA. D.B. 5, D.B. 6 and D.B. 7.	1	7-064	24.48	45	624	V.C.	L.C.
ENGINE ROOM LIGHTING. D.B. 15.	1	7-029	9	15	30	V.I.R.	L.C.+B.
AFT HEATING. D.B. 12.	1	19-083	80	191	620	V.C.	L.C.

#### MOTOR CABLES (CONTINUED).

FORWARD HOLD VENT FAN MOTOR.	1	1.88HP	1	7-029	8.2	15	300	V.I.R.	L.C.+B.
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#### MOTOR CABLES.

ALL IMPORTANT MOTORS TO BE ENUMERATED.	No.	B.H.P.							
WORKSHOP MOTOR.	1	3	1	7-026	14	24	300	V.I.R.	L.C.+B.
AUX. COOLING WATER PUMP MOTORS	2	4	1	7-026	17	24	150	V.I.R.	L.C.+B.
FUEL OIL PURIFIER MOTORS.	2	3	1	7-026	14	24	300	V.I.R.	L.C.+B.
LUB. OIL PURIFIER MOTOR	1	3	1	7-026	14	24	300	V.I.R.	L.C.+B.
ENGINE ROOM VENT FAN MOTOR	1	506	1	7-026	22	24	150	V.I.R.	L.C.+B.
CALORIFIERS	2	25KWS	1	19-083	112	118	240	V.I.R.	L.C.+B.
LUB. OIL PUMP MOTORS	2	45	1	37-083	170	184	326	V.I.R.	L.C.+B.
AIR COMPRESSOR MOTORS.	2	44	1	37-083	166	184	165	V.I.R.	L.C.+B.
FRESH WATER PUMP MOTOR.	1	20	1	19-064	77	83	270	V.I.R.	L.C.+B.
SALT WATER PUMP MOTORS	2	20	1	19-064	77	83	270	V.I.R.	L.C.+B.
FUEL OIL PUMP MOTOR.	1	12	1	19-064	48	83	180	V.I.R.	L.C.+B.
BALLAST PUMP MOTOR.	1	17	1	19-064	66	83	254	V.I.R.	L.C.+B.
BILGE & SANITARY PUMP MOTOR	1	10	1	7-064	40	46	246	V.I.R.	L.C.+B.
TURNING GEAR MOTOR.	1	8	1	7-064	32	46	249	V.I.R.	L.C.+B.
CO2 COMPRESSOR MOTORS	4	10	1	7-064	40	46	50	V.I.R.	L.C.+B.
REFRIG. CIRC. PUMP MOTORS	2	1	1	3-026	5	10	60	V.I.R.	L.C.+B.
WINCH MOTORS	8	25	1	19-064	95	151	100	V.C.	L.C.A.+B. 1/2 hr. rated.
WINCH MOTORS	4	44	1	19-083	166	225	80	V.C.	L.C.A.+B. 1/2 hr. rated.
WINDLASS MOTOR	1	44	1	19-083	166	225	140	V.C.	L.C.A.+B. 1/2 hr. rated.
CAPSTAN MOTOR.	1	28	1	19-083	106	225	140	V.C.	L.C.A.+B. 1/2 hr. rated.
STEERING GEAR MOTORS.	2	18	1	19-083	140	225	600	V.C.	L.C.A.+B. 1/2 hr. rated.
GALLEY STOVE	1	24.28KWS	1	19-064	124	135	300	V.C.	L.C.A.+B.
MIDSHIP ACCOM. VENT FANS.	2	2.8	1	7-029	11	15	60	V.I.R.	L.C.
HYDROFORE PUMP MOTORS.	2	1	1	7-026	5	24	100	V.I.R.	L.C.+B.
TETRACHLOR EVAPORATOR.	1	10KWS	1	7-064	45	46	60	V.I.R.	L.C.+B.
LUB. OIL HEATER.	1	15KWS	1	19-064	68	83	180	V.I.R.	L.C.+B.
FUEL OIL HEATERS	2	15KWS	1	19-064	68	83	180	V.I.R.	L.C.+B.
CARGO REFRIG. VENT. FAN MOTORS.	2	0.92HP	1	7-029	4.7	15	120	V.I.R.	L.C.+B.
HOLD VENT FAN MOTORS.	2	0.92HP	1	7-029	4.7	15	200	V.I.R.	L.C.+B.

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. For CLARKE, CHAPMAN & Co. LTD,

*L. J. Harker*

Director.

Electrical Engineers.

Date 31<sup>st</sup> March '48.

#### COMPASSES.

Minimum distance between electric generators or motors and standard compass..... 40 FEET.

Minimum distance between electric generators or motors and steering compass..... 40 FEET.

The nearest cables to the compasses are as follows:—

A cable carrying 0.07 Ampères 6 feet from standard compass INSIDE feet from steering compass.

A cable carrying 0.07 Ampères INSIDE feet from standard compass 6 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 EVERY course in the case of the standard compass, and NIL degrees on EVERY course in the case of the steering compass.

FOR AND ON BEHALF OF  
LLOYD'S REGISTER OF SHIPPING CO. LTD.

*[Signature]*

Builder's Signature.

Date 14<sup>th</sup> April 48.

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

Plans. Are approved plans forwarded herewith..... No If not, state date of approval..... 9<sup>th</sup> APRIL 1944

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 ELECTRICAL EQUIPMENT OF THIS VESSEL HAS BEEN INSTALLED IN ACCORDANCE WITH THE SOCIETY'S RULES AND REGULATIONS  
AND THE ARRANGEMENTS ARE IN ACCORDANCE WITH OR EQUIVALENT TO THOSE SHOWN ON THE APPROVED PLANS

THE MATERIALS USED ARE OF GOOD QUALITY AND THE WORKMANSHIP IS SATISFACTORY.

ON COMPLETION, THE INSULATION RESISTANCE OF ALL CIRCUITS WAS ABOVE RULE REQUIREMENTS, AND THE GENERATORS OPERATED ON  
LOAD AND GOVERNING TESTS WITH SATISFACTORY RESULTS.

"AS FITTED" WIRING DIAGRAM DRAWING NO. 1623/2 ATTACHED HERETO.

THE EQUIPMENT, AS INSTALLED, IS, IN MY OPINION, SUITABLE FOR A CLASSED VESSEL.

*Noted*

19.5.48.

Total Capacity of Generators..... 460 Kilowatts.

NEWCASTLE A/C £ 57-4-0  
The amount of Fee ... £ 14-6-0  
COPENHAGEN A/C.

When applied for,

7.4 MAY 1948

Travelling Expenses (if any) £ : : When received.

19.....

*[Signature]*  
Surveyor to Lloyd's Register of Shipping.

Committee's Minute..... FRI. 21 MAY 1948

Assigned For which see J.E. each Rpt