

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

9<sup>th</sup> MAR 1948

Date of writing Report... 19<sup>th</sup> February 1948 When handed in at Local Office... 25 FEB 1948 Port of... NEWCASTLE-ON-TYNE

No. in Survey held at WALLSEND - ON - TYNE Date, First Survey 12<sup>th</sup> AUGUST, 1947 Last Survey 18<sup>th</sup> FEBRUARY 1948  
Reg. Book. 36544 on the S.S. "HYALINA" (Number of Visits... 23) Tons { Gross 2200 Net 730

Built at WALLSEND. By whom built SWAN HUNTER & WIGHAM RICHARDSON LTD., Yard No. 1753 When built 1944-48.

Owners: ANGLO SAXON PETROLEUM CO. LTD. Port belonging to LONDON.

Electrical Installation fitted by SWAN HUNTER & WIGHAM RICHARDSON LTD. Contract No. - When fitted 1944-8

Is vessel fitted for carrying Petroleum in bulk YES 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 110.

Heating 110 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 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 110 Volts - No 220 Volts - 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 - TURBO FLAT

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 IN ENGINE ROOM NEAR TURBO 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 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 TURBO-GENERATORS - 3 POLE CIRCUIT BREAKER WITH O/L. ON 2 POLES, REVERSE CURRENT AND OVERSPEED TRIPS, 3<sup>rd</sup> POLE FOR EQUALISER. - 110 VOLT GENERATORS AND M/G. SETS 2 POLE CIRCUIT BREAKER WITH OVERLOAD TRIPS.

and for each outgoing circuit 2 POLE CIRCUIT BREAKER WITH O/L. TRIPS. OR D.P. SWITCH WITH A FUSE ON EACH POLE FOR 220 VOLTS CIRCUITS, AND DOUBLE POLE CHANGEOVER SWITCH WITH A FUSE ON EACH POLE FOR 110 VOLT CIRCUITS.

Are compartments containing switchboards composed of fire-resisting material or lined as per Rule YES Instruments on main switchboard 6

ammeters 6 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 3700 AMPS, 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 YES 350 AMPS.

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 13.2 VOLTS ON 220 VOLTS 5.6 VOLTS ON 110 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

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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. **MAIN CABLES - LEAD COVERED ARMOURD + BRAIDED OR LEAD COVERED AND ARMOURD CLIPPED TO STEEL TEAMS.**

**GENERATOR MAINS - COPPER BAR CLIPPED IN SINDANYO CLAMPS.**

**ACCOMMODATION CABLES - LEAD COVERED CLIPPED TO WOOD GROUNDS.**

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. **LEAD.** Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule.  Emergency Supply, state position.

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.

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.

**"WIGAN" FLAMEPROOF FITTINGS**

and where are the controlling switches fitted. **OUTSIDE SPACE IN ACCOMMODATION ALLEYWAY.** 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.  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 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.  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				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN	2	550	220	2500	1000	STEAM TURBINE.		
	1	60	110	546	600	STEAM ENGINE.		
EMERGENCY								
ROTARY TRANSFORMER	1	60	110	546		ELECTRIC MOTOR.		

**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	550	2	4" x 1/4"	2500	-	50	COPPER BAR.	
" EQUALISER		1	4" x 1/4"	1250	-	25	COPPER BAR.	
GENERATOR.	60	1	91-093	546	624	90	V.C.	L.C.+A.
EMERGENCY GENERATOR								
ROTARY TRANSFORMER: MOTOR	91HP	1	37-103	345	385	168	V.C.	L.C.+A.
" GENERATOR	60KW.	1	91-093	546	624	120	V.C.	L.C.+A.

**MAIN DISTRIBUTION CABLES.**

DESCRIPTION.	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.			
AUX. SWITCHBOARDS AND SECTION BOARDS	1	7-044	20	42	240	V.C.	L.C.+A.
SECTION BOX. "A" SWITCHBOARD PLATFORM.	1	19-064	100	135	45	V.C.	L.C.+A.
SECTION BOX. "B" TOP OF ENGINE CASINA.	1	37-072	240	246	150	V.C.	L.C.+A.
SECTION BOX. "C" UPPER DECK APT. PORT PASSAGE	1	19-064	110.8	135	210	V.C.	L.C.+A.
SECTION BOX. "D" TURBO. MACHINERY ROOM.	1	19-064	84.3	135	45	V.C.	L.C.+A.
SECTION BOX. "E" MIDSHIP SWITCHBOARD ROOM	1	19-064	100.9	135	18	V.C.	L.C.
SECTION BOX. "G" WORKSHOP.	1	7-064	62	46	210	V.C.	L.C.+A.
SECTION BOX. "H" TOP OF ENGINE CASINA	1	7-064	64	46	150	V.C.	L.C.+A.
SECTION BOX. "J" BRIDGE DECK PORT.	1	7-064	64	46	18	V.C.	L.C.
SHORE CONNECTION BOX.	1	37-072	200	246	120	V.C.	L.C.+A.
MIDSHIP SWITCHBOARD.	1	61-093	300	464	955	V.C.	L.C.+A.
SUEZ CANAL PROTECTOR.	1	19-064	28	135	735	V.C.	L.C.+A.
GYRO COMPASS CIRCUITS.	1	7-036	20	28	105	V.C.	L.C.

**LIGHTING AND HEATING, ETC., CABLES.**

WIRELESS	1	7-052	30	54	150	V.C.	L.C.
NAVIGATION LIGHTS D.B. "F" CHARTROOM.	1	7-044	23	42	135	V.C.	L.C.
LIGHTING AND HEATING D.B. "D.I." E.R. BOILER ROOMS.	1	7-044	19.2	42	105	V.C.	L.C.+A.
D.B. "D.2" ENGINE ROOM AND BOILER ROOM.	1	7-044	12.1	42	195	V.C.	L.C.+A.
D.B. "D.3" ENGINE ROOM AND BOILER ROOM	1	7-044	12	42	15	V.C.	L.C.+A.
D.B. "D.4" ENGINE ROOM AND BOILER ROOM	1	7-044	12.7	42	90	V.C.	L.C.+A.
D.B. "D.5" ENGINE ROOM AND BOILER ROOM	1	7-044	19.7	42	210	V.C.	L.C.+A.
D.B. "D.6" ENGINE ROOM AND BOILER ROOM	1	7-044	10.6	42	195	V.C.	L.C.+A.
D.B. "C.1" POOP DECK PORT PASSAGE.	1	7-044	16.2	42	30	V.C.	L.C.
D.B. "C.2" POOP DECK STAR. PASSAGE.	1	7-044	19.8	42	90	V.C.	L.C.
D.B. "C.3" POOP DECK PORT PASSAGE	1	7-044	22.3	42	120	V.C.	L.C.
D.B. "C.4" UPPER DECK + APT STAR. PASSAGE.	1	7-044	17.0	42	210	V.C.	L.C.
D.B. "C.5" UPPER DECK + APT PORT PASSAGE	1	7-044	17.5	42	81	V.C.	L.C.
D.B. "E.1" UPPER BRIDGE DECK.	1	7-044	17.2	42	45	V.C.	L.C.
D.B. "E.2" BRIDGE DECK PORT.	1	7-044	18	42	81	V.C.	L.C.
D.B. "E.3" BRIDGE DECK PORT.	1	7-044	30	42	81	V.C.	L.C.
D.B. "E.4" BRIDGE DECK STAR.	1	7-044	20.5	42	99	V.C.	L.C.
D.B. "E.5" FORECASTLE.	1	7-064	15.2	75	480	V.C.	L.C.+A.
D.B. "L" BRIDGE DECK PORT.	1	7-044	25	42	90	V.C.	L.C.

**MOTOR CABLES.**

ALL IMPORTANT MOTORS TO BE ENUMERATED.	No.	B.H.P.							
FORCED DRAUGHT FAN MOTORS.	3	25	1	19-064	95	135	480	V.C.	L.C.+A.
FIRE + BILGE PUMP MOTORS.	2	15/27	1	19-064	104	135	390	V.C.	L.C.+A.
FRESH WATER PUMP MOTOR.	1	3/4 1/2	1	7-036	20	28	125	V.C.	L.C.+A.
FORCED LUB. OIL PUMP MOTORS	2	11	1	7-052	43	54	294	V.C.	L.C.+A.
COOLER CIRC. PUMP MOTOR.	1	5/8	1	7-044	32	42	270	V.C.	L.C.+A.
TURBO. GENERATOR CIRC. PUMPS.	2	7/9 1/2	1	7-044	40	42	135	V.C.	L.C.+A.
PROPULSION MOTOR FAN MOTORS	2	15	1	7-064	60	45	240	V.C.	L.C.+A.
MAIN EXTRACTION PUMP MOTORS	2	13.5	1	7-064	55	75	270	V.C.	L.C.+A.
MAIN CIRCULATING PUMP MOTORS	2	40/90	1	37-103	360	385	270	V.C.	L.C.+A.

AFT. ACCOMM. VENT FAN.	1	5	1	7-052	40	54	150	V.C.	L.C.+A.
TURNING GEAR MOTOR.	1	10	1	19-044	80	87	150	V.C.	L.C.+A.
GRINDING MACHINE MOTOR.	1	2	1	7-036	18	28	30	V.C.	L.C.+A.
DRILLING MACHINE MOTOR	1	2	1	7-036	18	28	30	V.C.	L.C.+A.
LATHE MOTOR	1	3	1	7-036	26	28	30	V.C.	L.C.+A.
BOILER ROOM VENT. FANS.	2	4 1/2	1	7-052	40	54	180	V.C.	L.C.+A.
ENGINE ROOM VENT. FANS.	4	4 1/2	1	7-052	40	54	105	V.C.	L.C.+A.
APT. PORT WINCH CONNECTIONS	2	4	1	7-044	32	42	150	V.C.	L.C.
MIDSHIP BOAT WINCH CONNECTIONS	2	4	1	7-044	32	42	159	V.C.	L.C.
MIDSHIP ACCOMM. VENT. FAN. MOTOR.	1	5	1	7-052	40	54	150	V.C.	L.C.
LUB. OIL TRANSFER PUMP MOTOR	1	1	1	7-036	10	28	240	V.C.	L.C.+A.
LUB. OIL PURIFIER MOTORS	2	3	1	7-036	26	28	150	V.C.	L.C.+A.
DOMESTIC FRESH WATER PUMP.	1	3/4 1/2	1	7-052	28	54	180	V.C.	L.C.+A.

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.

SWAN, HUNTER, & WICKHAM, ENGINEERS, LTD. *W. H. W.* Electrical Engineers. Date 23 Feb 1948

**COMPASSES.**  
 Minimum distance between electric generators or motors and standard compass 45 FEET FROM MIDSHIP VENT. FAN MOTOR.  
 Minimum distance between electric generators or motors and steering compass 45 FEET FROM MIDSHIP VENT. FAN MOTOR.  
 The nearest cables to the compasses are as follows:—  
 A cable carrying 0.14 Ampères INSIDE feet from standard compass 6 feet from steering compass.  
 A cable carrying 0.14 Ampères 6 feet from standard compass INSIDE 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.  
 SWAN, HUNTER, & WICKHAM, ENGINEERS, LTD. *W. H. W.* Builder's Signature. Date 23-2-48

Is this installation a duplicate of a previous case Yes. If so, state name of vessel S.S. "HELENA"  
 Plans. Are approved plans forwarded herewith \_\_\_\_\_ 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 ELECTRICAL EQUIPMENT OF THIS VESSEL HAS BEEN INSTALLED UNDER SPECIAL SURVEY.  
THE MATERIALS USED ARE OF GOOD QUALITY AND THE WORKMANSHIP IS SATISFACTORY.  
ON COMPLETION THE ELECTRICAL EQUIPMENT WAS RUN UNDER WORKING CONDITIONS WITH SATISFACTORY RESULTS  
THE PROTECTIVE DEVICES OF THE CIRCUIT BREAKERS WERE ADJUSTED AND OPERATED, AND THE INSULATION RESISTANCE  
OF ALL CIRCUITS WAS MEASURED AND FOUND GOOD.  
THE EQUIPMENT IS, IN MY OPINION, SUITABLE FOR A CLASSED SHIP INTENDED TO CARRY OIL HAVING A  
FLASH POINT OF LESS THAN 150°F.

*Noted*  
*[Signature]*  
 18.3.48

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

Total Capacity of Generators 1160 Kilowatts.  
 INCLUDING 150KWS. FOR EXCITATION OF ELECTRICAL PROPULSION MACHINERY.  
 LONDON Acc # 17-1-0 }  
 The amount of £ 85 : 5 : 4 MAR 1948  
 NEWCASTLE Acc # 68-4-0 }  
 For Propelling Machinery 175 : 0 : 0  
 Travelling Expenses (if any) £ : :  
 When applied for, 17/12/47  
 When received, 19.....

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

Committee's Minute FRI. 16 APR 1948  
 Assigned See F.E. mahy rpt