Rpt. 4d.

NEWCASTLE-ON-TYNE, No. 104096

No. 113815

REPORT ON ELECTRIC PROPELLING MACHINERY.

3 DEC 1946

Received at London Office 13 MAY 1946

Date of writing Report 6 May 1946 When handed in at Local Office 13 MAY 1946 Port of London

No. in Reg. Book. Survey held at Rugby Date, First Survey 18th October 1944 Last Survey 27 February 1946

Number of Visits 16.

~~Single~~ ~~or Twin~~ ~~Triple~~ ~~Quadruple~~ Screw vessel T.E.S. "HELICINA" Tons Gross ✓1216 Net ✓732

Built at Wallsend By whom built Swan Hunter & Co Ltd Yard No. 1711 When built 1945

Electrical Machines made at Rugby By whom made B.T.H. Co Ltd Contract No. E.10171. Generator Nos R197086 R197087 Motor Nos STATOR. R195309 ROTOR. R183798 When made 1945.

Shaft Horse Power at Full Power 13000 S.H.P. See endorsement attached 12.12.46 Total capacity of Generators 10,000 kilowatts

Nom. Horse Power as per Rule . Owners ✓ Port belonging to ✓

Grade for which Vessel is intended ✓

STEAM ENGINES.—Type of Engine Turbine No. of Engines Two Revs. per minute 3060/4150

Is Governor fitted Yes Is the speed variation as per Rule when load is thrown off ✓

Is an emergency Governor fitted Yes. Is it arranged for hand tripping Yes

Does it trip the throttle valve as per Rule Yes. If exhaust steam is admitted, is an

automatic shut-off fitted ✓ Is provision made for bleeding steam Yes. and

a non-return or positive shut-off valve fitted To be supplied by Shipbuilders

Torque Limiting.—*If generator capacity exceeds motor rating, state means provided for limiting torque input to screw shaft* ✓

Lubricating Oil.—*State what means are provided for emergency supply* gravity oil tank

Is the emergency reserve sufficient to maintain lubrication as per Rule ✓

Mechanical Balance.—*Are the Engines and Generators balanced so as not to cause appreciable vibration* Yes.

Report.—*Has a separate report Rpt. 4a for the Engines been issued*

GAS ENGINES.—*Type of Engines* Revs. per minute

Is Governor fitted Is the speed variation as per Rule when load is thrown off

Is an Emergency Governor fitted Does it operate as per Rule

Testing.—*Has each Engine been tested and found to be capable of developing 10 per cent. overload for one hour as per Rule*

Report.—*Has a separate report Rpt. 4b for the Engines been issued*

GENERATORS.—**Direct or Alternating Current** Alternating Current. No. of Generators Two.

If alternating current state number of phases Three. frequency 65 - 68 cycles per sec.

Kilowatts per Generator 5000 Voltage per Generator 3150 Amperes per Generator 916 AT 1·0 P.F.

Do they comply with the requirements regarding insulation materials Yes.

Terminals Yes., coolers See attached Memorandom thermometers Yes,

Location ✓, position in ship ✓, temperature rise See Memorandom

Embedded temperature detectors Yes. shaft currents ✓

Ventilation.—*State how this is arranged (open or closed system)* Closed. Opened in emergency only.

If open system are ventilating arrangements satisfactory Yes.

Heating when Idle.—*State what provision is made* The shunt fields of the alternators and double wound unit motor are provided with switching arrangements so that they may be connected in series and current passed at standstill.

Facilities for Inspection and Repair.—*Are these as per Rule* Yes.

Are wear-down gauges supplied Wear down gauges provided for alternators.

Bilges.—*Are the arrangements to prevent accumulation of bilge-water under the machines satisfactory* ✓

DOUBLE-UNIT

MOTORS.—S.H.P. per Motor at full power 13000 No. of Motors Two

Single or double unit Double unit. Voltage per Motor 3150 Amperes per Motor 916 AT

Do they comply with the requirements regarding insulation materials Yes - Class B.

terminals Yes., coolers See Memorandom, thermometers Yes., ventilation Open.

heating when idle Yes., shaft currents Yes., facilities for inspection and repair Yes.

mechanical protection Yes., lubrication Disc and wiper, position in ship Aft.

A.C. Motors.—Are the laminations securely clamped around the whole of the periphery Yes.

and are they insulated from one another with approved material Yes.

Is provision made for machining the collector rings split type slip rings and are readily remova

Do the Motors remain in step under all normal conditions of running ✓

D.C. Motors.—Are the brushes staggered as per Rule

If the system permits overspeeding at light loads are overspeed protection devices fitted

EXCITATION.—Is current for excitation taken from the ship's Auxiliary Generators Yes.

If so state voltage 220 D.C. and excitation amperes at full power 682 (1364 on double excitation) kilowatts for excitation 300 150

State arrangements for excitation of Propulsion Generators each Alternator shunt field is supplied from its own motor driven exciter, the motor being supplied from the ships 220 Volt a

and Propelling Motors a booster driven by the same motor as the generator exciter is in series the ships 220 volt supply.

If an alternative means of excitation is provided, state particulars ✓

✓

Do the Excitation Machines comply with the requirements regarding temperature rise at full power ✓

and after manœuvring as per Rule ✓ to be supplied

D.C. Systems.—Are the arrangements for Motor and Generator excitation as per Rule ✓

CONTROL.—Position of Main Control Panel ✓

Do the Control Panels comply with the requirements regarding position ✓

distance from combustible material ✓, grouping of controls Yes.

and instruments Yes., insulating materials (state what type is used) ebony Lindangos for fenols, mica tube contacts

spacing and shielding of live parts Yes., accessibility of parts Yes.

position of fuses Yes., proportioning of busbars Yes.

locking of screws and nuts Yes., labelling Yes., fuses for voltmeters, etc. Yes.

switches and circuit breakers Yes., fusible cutouts Yes.

proportioning of levers, connecting links, etc. See Memorandom., interlocking Yes.

provision for manual operation of contactors, etc. (state method employed) Contactors are manually operated.

earthing of instrument cases above 250 volts to earth Yes.

provision of renewable arcing tips on switches subject to arcing Yes.

capability of withstanding shock and inclination Yes.

operation with high and low voltage Yes. provision for maint

alignment of operating shafts See Memorandom rust proofing of parts Yes.

Overload and Short Circuit Protection.—State what means are provided under overload or short circuit conditions overload relay trips the excitation circuit breakers.

At what current or load is it set to operate ✓. Has it been tested by

by hand when running at full power and found satisfactory ✓

Earth Detection.—Is the main circuit provided with means for detecting earths Yes.

Are aural and visual alarms fitted Yes. Is main power interrupted by the occurrence of an earth fault No.

If a limiting resistance is connected in the earth detecting circuit what is the ohmic value no separate resistance, the resistance of the limits the current to 350 amperes.

What earth leakage current is necessary to operate the device Earth leakage relay operates on 2 amp

If a switch is used to disconnect the aural signal does it automatically switch on the visual alarm Yes.

Are the excitation circuits provided with means for earth detection Yes.

Mechanical Protection.—Are circuits above 250 volts to earth protected as per Rule ✓

Bridge or Deck Control.—Is bridge control provided ✓ If so, from how many stations ✓

Can they be operated freely without producing currents or loads in excess of the working capacity of the plant ✓

and without reference to electrical instruments ✓ Is an emergency control provided in the engine room ✓

and can the transfer to this control be made quickly in the engine room ✓

Can the emergency control be rendered mechanically independent of the bridge control ✓

Instruments and Gauges.—State what Instruments are provided for each Generator Stability Indicator, A.C. Voltmeter with switch A.C. ammeter with switch, wattmeter, Cambridge E.T.D indicator for all machines and for air and water temperatures.

and for each Motor As for Generators, one complete set for port and Aft half motors, and the other for Stbd and forward half motors.

and, for Steam Engines, what Gauges are provided Yes

Is an Insulation Tester provided ✓

Discharge Protection.—Are all circuits protected as per Rule Yes.

D.C. Systems.—If the Generators are connected in series state what means are provided to prevent reversal of rotation ✓

Are the Propulsion Generators also used alternatively for other purposes ✓

If so, is provision made for overload protection, voltage adjustment, etc., as per Rule ✓

Reversing Switches.—Are any provided ✓ If so, are they interlocked as per Rule ✓

Resistances.—Are shunt resistances for synchronous motor fields insulated as per Rule Yes.

Temperature Alarm.—Are machines with enclosed ventilating system, etc., fitted with temperature alarm Yes.

Auxiliary Power.—Are essential services protected from interruption due to overloading of non-essential circuits ✓

CONDUCTORS & CABLES.—Are all essential Conductors stranded as per Rule ✓

Are the ends of Paper and Varnished Cambric Insulated Cables sealed ✓

Are the ends of all Cables having a sectional area of 0·04 sq. in. and above provided with Cable sockets ✓

Are all Cables carrying alternating current as per Rule ✓ Have all Cables been tested at the makers' works as per Rule ✓

SECONDARY BATTERIES.—Are Batteries used for starting Main Propulsion Engines ✓

If so, have full particulars been submitted and approved ✓ Have they been tested under working conditions and do they give the number of starts required by the Rules ✓

Are they installed as per Rule ✓ Are the charging arrangements satisfactory ✓

SPARE GEAR.—If engaged on open sea service has a list of spare gear been submitted and approved As for the "OLNA"

Is a list of the articles supplied attached to this report No.

Are they stored as per Rule ✓

ELECTRIC PROPULSION EQUIPMENT CONDUCTORS.

DESCRIPTION—MAIN GENERATORS.	CONDUCTORS. No. per Pole.	CONDUCTORS. Nominal Area per Pole.	TOTAL MAXIMUM CURRENT—AMPERES. In Circuit.	TOTAL MAXIMUM CURRENT—AMPERES. Rule.	MAXIMUM VOLTAGE TO EARTH.	INSULATED WITH.	DI-ELECTRIC THICKNESS.	HOW PROTECTED.
MAIN GENERATORS								
GENERATOR FIELDS								
MAIN MOTORS								
MOTOR FIELDS								
CONTROL CIRCUITS								
OTHER CIRCUITS :—								

All Conductors are of annealed copper, conforming to International Electrotechnical Commission Publication No. 28.

The Insulated Conductors have withstood the dielectric tests specified in the Rules.

The foregoing is a correct description,

THE BRITISH THOMSON-HOUSTON CO., LTD.
per H. R. Canning.

Electrical Engineers. Date 5th April 1946.

COMPASSES.—Are Single-Conductor circuits carrying continuous current arranged with lead and return Conductors fitted as close to one another as possible

Have tests been made during adjustment of the Compasses to determine the effect of switching the main circuits on and off

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.*

Builders' Signature. Date

Dates of Survey while building

During progress of work in shops - 18th Oct: 1944, 19th Oct-44, 22nd March-45, 4th July-45, 14th & 30th Aug-45, 29th Oct-, 23rd & 27th Nov: -45, 14th & 15th Dec-45, 4th Jan: 7, 22nd & 24th Jan-46, 27th Feb: 1946

During erection on board vessel -

Total No. of visits

Is this machinery duplicate of a previous case Yes. *If so, state name of vessel* "OLNA" (1689)

General Remarks (*State quality of workmanship, opinions as to class, &c.* The Alternators, propulsion motor, cubicles and control desk, excitation and control panels, lever gear also exciters have been manufactured under special survey and in accordance with the approved plans. (Temperature rises - Please see attached memorandum)

The Alternators and Propulsion motor have undergone running tests on short circuit and open circuit conditions (Alternators with open type ventilation and propulsion motor with fans at full speed and load), such as to indicate that the temperature rises comply with the requirements of the Rules for Electrical Propelling Machinery at a Rating of 13,000 S.H.P. The exciter sets have been found satisfactory under full load working conditions and to be capable of momentary overloads as during manoeuvring. All the machines have been satisfactorily subjected to the high voltage tests required by the Rules. It was not found possible to complete erect the lever gear in conjunction with the Main cubicle, but the cam shaft was independently operated with satisfactory results.

The whole of the control gear was satisfactorily subjected to earth, and between poles and phases with the high voltage tests as required by the Rules.

The workmanship and materials used in the above components of the Electric Propelling Machinery were found to be good and sound.

		When applied for,
The amount of Entry Fee ...	£ : :	19
Travelling Expenses (if any)	£ : :	When received,
		19

J. H. Tickell.
Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI 20 DEC 1946

Assigned See E.E. mchy. spt.

The Surveyors are requested not to write on or below the space for Committee's Minute.