

No. 18411

19 MAR 1948

REPORT ON ELECTRIC PROPELLING MACHINERY.

Received at London Office

Of writing Report 18-3-1948 When handed in at Local Office 18-3-1948 Port of Middlesbrough
Survey held at Middlesbrough Date, First Survey 28-11-1947 Last Survey 19-12-1947
Book. No. of Visits 4
Single on ~~Triple~~ Screw vessel "ESSO PURFLEET"
Gross 10712
Net
Built at Chester, Pa. By whom built Dun S. B. & O. D. Co. Ltd. Yard No. When built 1944
By whom made Westinghouse Electric & Manufacturing Co. Ltd. Generator Nos. When made 1944
Motor Nos.
Electrical Machines made at Pa. Total Capacity of Generators 5400 kilowatts
Shaft Horse Power at Full Power 6600
Machinery Numeral as per Rule Owners Anglo American Oil Co. Ltd. Port belonging to London
Made for which Vessel is intended Carrying petroleum in Bulk.

INS.— Have plans of the Machines, Control Gear, Cables and Circuits been submitted and approved.

STEAM ENGINES.— Type of Engine Steam Turbine No. of Engines 1 R.P.M. 3600 Is a Governor fitted Yes Is the speed variation as per Rule when load is thrown off Yes Is an Emergency Governor fitted Yes Is it arranged for hand tripping Yes Does it trip the throttle valve Yes If exhaust steam is admitted, is an automatic shut-off fitted — Is provision made for bleed steam — and is a non-return or positive shut-off valve fitted — Lubricating Oil.— State means provided for emergency supply Duplicate lubricating oil pumps and reserve tank, (gravity feed).
the emergency reserve sufficient to maintain lubrication as per Rule Yes Mechanical Balance.— Are the Engines and Generators balanced so as not cause appreciable vibration Yes

L ENGINES.— Type of Engines — R.P.M. — Is a 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 —

GENERATORS.— Direct or Alternating Current A.C. No. of Generators 1 If A.C. state frequency at full load 60 ~
Watts per Generator 5400 Volts per Generator 2300 Amps. per Generator — Have certificates of works tests been applied — and the results found as per Rule — Ventilation.— State how arranged (open or closed system) closed system

Are ventilating arrangements satisfactory Yes Heating when Idle.— What provision is made Electrical heating
at base of generator, in the ventilation ducts. Facilities for Inspection and Repair.— Are these as per Rule Yes
Are wear-down gauges supplied Yes Bilges.— Are the arrangements to prevent accumulation of bilge-water under the machines satisfactory

MOTORS.— S.H.P. per Motor at full power 6600 No. of Motors 1 Single or double unit Single Volts per Motor 2300
Amps. per Motor — Have certificates of works tests been supplied — and the results found as per Rule — A.C. Motors.— Is provision made for machining the slip rings Yes Do the Motors remain in synchronism under all normal conditions of running — D.C. Motors.— If the system permits overspeeding at light loads are overspeed protection devices fitted —

EXCITATION.— Is power for excitation taken from the ship's Auxiliary Generators Yes If so, state voltage 125 and excitation amperes at full power — kilowatts for excitation — State excitation arrangements for Propulsion Generators Separate excitation taken from duplicate turbo driven exciters (normal one machine running and the other a standby).
and Propelling Motors As for Propulsion Generator Is an alternative means of excitation provided Yes — standby exciter.
Have certificates of works tests been supplied — and found as per Rule —

CONTROL.— Position of Main Control Panel Athwartships, forward in Engine Room and facing aft.
Does it comply with the requirements regarding position Yes, grouping of controls Yes, instruments —, insulating materials (state type used) —, spacing and shielding of live parts Yes, accessibility Yes, position of fuses —
locking of screws and nuts Yes, labelling —, fuses for voltmeters, pilot lamps, etc. —, provision for manual operation of contractors, etc. (state method employed) Contactor gear mechanically operated from manually operated starting platform lever in conjunction with electrical interlocks.
earthing of instrument cases above 250 volts to earth Yes, provision of renewable tips on switches subject to arcing Yes, capability of withstanding shock and inclination —, operation with high and low voltage —, rust proofing of parts. Overload and Short Circuit Protection.— State means provided —

At what load is it set to operate — Has it been tripped by hand when running at full power and found satisfactory —
Are fuses of an approved type —

Earth Detection.— Is the main circuit provided with means for detecting earths Yes Are aural and visual alarms fitted Visual Is main power interrupted by an earth fault — If a limiting resistance is in the earth detecting circuit what is the ohmic value — What earth leakage current is necessary to operate the device — If a switch is used to disconnect the aural signal does it automatically give visual indication — Are the excitation circuits provided with means for earth detection — Mechanical Protection.— Are circuits above 250 volts to earth protected as per Rule —

Bridge or Deck Control.— Is bridge control provided No If so, from how many stations — can it 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 deck control — Instruments and Gauges.— State Instruments provided for each Generator —
and for each Motor — Is an Insulation Tester provided Yes

Discharge Protection.— Are all shunt field circuits protected as per Rule — D.C. Systems.— If the Generators are connected in series state means provided to prevent reversal of direction of rotation of the Prime Movers. —

Are the Propulsion Generators also used alternatively for other purposes Yes If so, is provision made for overload protection, voltage adjustment, etc. —

E.V. "ESSO PURFLEET" No in Register Book. 23598.

Electrical Installation.

During the period the above vessel was in dry dock at Messrs. Smiths Dock Co. Southbank Shields through the following work was carried out:-

Main Alternator

Stator End Shields removed and windings examined. Stator and windings cleaned with carbon tetrachloride and End Shields refitted. Rotor brushgear cleaned, brush pressure adjusted and sliprings cleaned.

On completion the main alternator was tested and the insulation resistance was found to be satisfactory.

Note. The rotor was not withdrawn from the stator bore.

Propulsion Motor. (Rotor not withdrawn from stator bore.)

Stator End Shields removed and windings examined. Connections checked over and Stator windings cleaned with carbon tetrachloride, and End Shields refitted.

Rotor windings cleaned and examined, and sliprings cleaned. Rotor brushgear cleaned, brush pressure adjusted and reassembled. On completion the propulsion motor was tried and the insulation resistance measured and found to be satisfactory.

The ventilating fan motors in the enclosed cooling system were both opened up, bearings checked, stator & rotor windings examined and cleaned. The sliprings and brushgear were cleaned and on reassembling the brush pressure were adjusted.

On completion the fan motors were tried and the insulation resistance of both motors measured and found to be satisfactory.

Auxiliary Generators. (Rotors not withdrawn from the stator bores)

The stator end shields were removed and the windings on both AC and DC generators were examined and cleaned. Sliprings and DC commutators were cleaned and stator end guards reassembled. All brushgears cleaned and brush pressure adjusted.

On completion the Auxiliary Generators were tried and the insulation resistance measured and found good.

Main Switchboard.

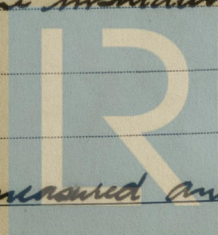
Contacts removed from all circuit breakers, cleaned, and reassembled.

All connections on the back of the board were checked, check nuts tightened and bus bars cleaned.

On completion the switchboard was tried, and the insulation resistance measured and found good.

Auxiliary Switchboard.

All connections checked, and insulation resistance measured and



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E.V. "ESSO PURFLEET" (continued page 2).

found good.

On both main and auxiliary switchboards the automatic was checked, operated and found satisfactory.

Boiler Forced Draught Fans.

3 Boiler Forced Draught Fans were opened up and on examination it was found necessary to replace all bearings (6).

The stator and rotor windings were cleaned and varnished.

On reassembling the fans were tried under working conditions and found to be satisfactory.

3-200 HP. Cargo Pump Motors.

All motors opened up, bearings cleaned, stator and rotor windings cleaned and varnished.

On completion the motors were reassembled and the insulation resistance measured and found good.

Main Turbine Distancer Tachometer.

The generator for the tachometer was opened up, and it was found necessary to replace both bearings and fit a new driving key.

On completion the turbine was run at varying speeds and the tachometer readings were checked against a standard tachometer.

The results were found to be satisfactory.

Minor repairs and adjustments were made to the installation and fittings made good where necessary.

Before sailing the main turbine and auxiliaries were tried, and the propulsion motor turned over "ahead" and "astern."

The main turbine was tripped on overspeed and also from the 'Emergency' hand trip on the driving platform with satisfactory results.

The insulation resistance of all circuits was measured and found good.

Propulsion Motor:- 6600 HP. ✓

Propulsion Gen:- 5400 KW. ✓

Auxiliary Generators AC:- 2 x 400 KW.

" " DC:- 2 x 75 KW.

" " DC:- 2 x 55 KW.

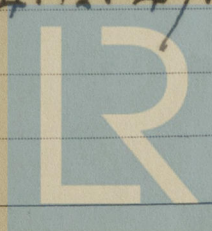
Mainboard Service Gen:- 1 x 50 KW.

Emergency Generator AC:- 1 x 75 KW.

R. M. Billo.

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Reversing Switches.—If any are provided are they interlocked as per Rule..... Resistances.—Are resistances for synchronous motor fields insulated as per Rule..... Temperature Alarm.—Are machines with enclosed ventilating system, etc., fitted with temperature alarm.....

CONDUCTORS & CABLES.—Are all essential Conductors stranded as per Rule..... Are the ends of Paper and Varnished Cambric Insulated Cables sealed..... Are all Cables carrying A.C. constructed and installed as per Rule..... Have all Cables been tested at the makers' works.....

SECONDARY BATTERIES.—Are Batteries used for starting Main Propulsion Engines..... If so, have full particulars of rating been submitted and approved..... Have they been tested under working conditions and do they give the required number of starts..... 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..... Is a list of the articles supplied attached to this report..... Are they stored as per Rule.....

ELECTRIC PROPULSION EQUIPMENT CONDUCTORS.

DESCRIPTION	CONDUCTORS.		TOTAL MAXIMUM CURRENT—AMPERES.*		Rule.	MAXIMUM VOLTAGE TO EARTH.	INSULATED WITH.	DI-ELECTRIC THICKNESS.	HOW PROTECTED.
	No. per Pole.	Nominal Area per Pole.	In Circuit.						
			When Running.	When Manoeuvring.					
MAIN GENERATORS	1								
GENERATOR FIELDS	2		1		1/2	1/2	1/2		
MAIN MOTORS	1		1/2				1/2		1/2
MOTOR FIELDS	1								
CONTROL CIRCUITS					1/2				
OTHER CIRCUITS:—									

*For field circuits the "Hot" and "Cold" value should be given.

The foregoing is a correct description,

Electrical Engineers.

Date

COMPASSES.—Are Single-Conductor circuits carrying direct 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.....

Builders' Signature.

Date

Is this machinery duplicate of a previous case..... If so, state name of vessel.....

General Remarks (State quality of workmanship, opinions as to class, &c.) See continuation sheet attached to

Middleburgh April 9

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

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

Date

Committee's Minute

FRI. 4 FEB 1948

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