

Rpt. 13.

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

No. 19249

118 JAN 1951

Date of writing Report 5th Jan 1951 When handed in at Local Office 16th Jan 1951 Received at London Office
 No. in Survey held at Harrison Hill-on-Tus. Date, First Survey 29.6.50 Last Survey 22.12.19.50
 Reg. Book.

95143 on the T. E. V. "San Salvador"
 Built at Harrison Hill-on-Tus. By whom built Furness S. B. Co. Ltd. Yard No. 445 When built 1950
 Owners Eagle Oil & Shipping Co. Ltd. Port belonging to London
 Installation fitted by Furness Shipbuilding Co. Ltd. When fitted 1950

Is vessel equipped for carrying Petroleum in bulk Yes Is vessel equipped with D.F. Yes E.S.D. Yes Gy.C. Yes Sub.Sig. — Radar —

Plans, have they been submitted and approved Yes System of Distribution Two wire Voltage of Lighting 110

Heating 220/110 Power 220/110 D.C. or A.C., Lighting D.C. Power D.C. If A.C. state frequency —

Prime Movers, has the governing been found as per Rule when full load is thrown on and off Yes Are turbine emergency governors fitted with a trip switch Yes Generators, are they compound wound Yes, and level compounded under working conditions Yes, if not compound wound state distance between generators — and from switchboard — Are the generators 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

Position of Generators On 22 ft flat; Port, starboard and on centerline aft in Engine Room, is the ventilation in way of generators satisfactory Yes, are they clear of inflammable material and protected from mechanical injury and damage from water, steam and oil Yes Switchboards, where are main switchboards placed on flat above diesel generator, arranged in workshops and facing forward, are they in accessible positions, free from inflammable gases and acid fumes and protected from mechanical injury and damage from water, steam and oil Yes, what insulation is used for the panels Sindanyo Ebony finish, 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, including locking of screws and nuts Yes Description of Main Switchgear for each generator and arrangement of equaliser switches Triple Pole Air Break Circuit Breaker with Overloads and Time delays on two poles, Reverse Current relay, No-volt coil, and third pole coupled to equaliser

and the switch and fuse gear (or circuit breakers) for each outgoing circuit Double Pole Air Break Circuit Breaker with Overloads and Time delays; Triple Pole Double Throw and Double Pole Single Throw Quick Break Knife Switches all through Double Pole Fuses

Are compartments containing switchboards composed of fire-resisting material or lined as per Rule Yes Instruments on main switchboard 12 ammeters 4 voltmeters — synchronising devices — For compound machines in parallel are the ammeters and reversed current protection devices connected on the pole opposite to the equaliser connection Yes Earth Testing, state means provided Earth lamps coupled to Earth through switches and fuses

Switches, Circuit Breakers and Fuses, are they as per Rule Yes, are the fuses an Approved Type Yes, make of fuses Siemens 'Z', are all fuses labelled Yes If circuit breakers are provided for the generators, at what overload do they operate 50% and at what current do the reversed current protective devices operate 15%

Joint Boxes, Section Boards and Distribution Boards, is the construction as per Rule Yes

Cables, are they insulated and protected as per Rule 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 1/32 x 6/64, are the ends of all cables having a sectional area of 0.01 square inch and above provided with soldering sockets Yes Are all paper insulated and varnished cambric insulated cables sealed at the ends 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 any 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 — or of the "HR" type — State how the cables are supported or protected All cables in Engine Room clipped to steel tray plates and protected where necessary. Forward cables supported by hard wood blocks under fore and aft gangways. Lead covered cables in accommodation cladded to wood grounds

Are all lead sheaths, armouring and conduits effectually bonded and earthed Yes 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 Refrigerated chambers, are the cables and fittings as per Rule Yes

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Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule *Yes*. Emergency Supply, state position *Yes*.
 "NEVERFAYLE" System in Engine Room. Automatic on failure of 110 volt supply. *Yes*.
 Navigation Lamps, are they separately wired *Yes*. Are the switches and fuses in a position accessible only to the officers on watch *Yes*. Is an automatic indicator fitted *Yes*. Is an alternative supply provided *Yes*.
 Secondary Batteries, are they constructed and fitted as per Rule *Yes*. Are they adequately ventilated *Yes*.
 state battery capacity in ampere hours. *10 "NIFE"*

Fittings, are all fittings on weather decks, in stokeholds and engine rooms and wherever exposed to drip or condensed moisture, weatherproof *Yes*.
 Are any fittings installed where readily combustible materials or inflammable or explosive dust or gases are likely to be present *Yes*.
 if so, how are they protected *Telford, Burr MacKay, Wigan, Hampshire fittings in Pump Room, Newcastle*
 and where are the controlling switches fitted *Officers Quarters midships*. Are all fittings suitably ventilated *Yes*.

Searchlight Lamps, No. of *—*, whether fixed or portable *—*, are they of the carbon arc or of the filament type *—*.

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 *—*. Motors, are all motors constructed and installed as per Rule and placed in well-ventilated compartments in which inflammable gases cannot accumulate and protected from damage from water, steam and oil *Yes*.

Are motors coupled to oil fuel transfer and 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 sea 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 *—*. 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 *Yes*. Are all fuses of an Approved Cartridge Type *Yes*. Make of fuse *Siemens 'Z'*. Are the fittings for pump rooms, tween deck spaces, etc., in accordance with the special requirements for such ships *Yes*. Are the cables lead covered as per Rule *Yes*.

E.S.D., if fitted state maker *Marcanti*. Location of transmitter *Frames 39/40* and receiver *Frames 38/40*.

Spare Gear, if the vessel is for open sea service have spares been provided as per Rule and 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	MAKER.	RATED AT				PRIME MOVER.	
			Kilowatts per Generator.	Volts.	Ampères.	Revs. per Min.	TYPE.	MAKER.
MAIN	2	General Electric Co.	400	220	1820	1000	Steam turbine	General Electric Co.
	1	General Electric Co.	150	220	682	600	Diesel	Wm. B. Dunsen & Day
EMERGENCY ROTARY TRANSFORMER	2	General Electric Co.	78 HP / 50 KW	220 / 110	292 / 455	1100	Electric motor	General Electric Co.

GENERATOR CABLES.

DESCRIPTION.	KILOWATTS.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus return feet).	INSULATION.	PROTECTIVE COVERING.
		No. in Parallel per Cable.	Sectional Area of No. and Dia. of Strands. Sq. ins. or sq. mm.	In the Circuit.	Rule.			
MAIN GENERATOR NO. 57576/1 (A)	400	4	61/103	1820	2288	120	V.6.	Lead covered & braided
" " EQUALISER	400	2	61/103	910	1144	60	V.6.	Lead covered & braided
" " NO. 57576/2 (B)	400	4	61/103	1820	2288	160	V.6.	Lead covered & braided
" " EQUALISER	400	2	61/103	910	1144	75	V.6.	Lead covered & braided
" " NO. 57907/1 (E)	150	2	37/103	682	816	66	V.6.	Lead covered & braided
" " EQUALISER	150	1	37/103	341	408	33	V.6.	Lead covered & braided
EMERGENCY GENERATOR	78 HP	1	37/083	292	314	33/45	V.6.	Lead covered & braided
ROTARY TRANSFORMER: MOTOR	50	1	61/093	455	492	45/54	V.6.	Lead covered & braided
" " GENERATOR	50	1	37/083	292	314	24/27	V.6.	Lead covered & braided

MAIN DISTRIBUTION CABLES (to Section Boards, Distribution Fuse Boards, etc.).

DESCRIPTION.

Main switchboard to Main Supply.	1	37/083	—	314	130	V.6.	Lead covered & braided
Main switchboard to Galley.	1	19/083	206	202	150	V.6.	Lead covered & braided
Main switchboard to Engine Room D.B. 'G'	1	7/064	53	80	280	V.6.	Lead covered & braided
Main switchboard to Engine Room D.B. 'U'	1	7/064	34	80	120	V.6.	Lead covered & braided
Main switchboard to Engine Room D.B. 'V'	1	7/064	51	80	280	V.6.	Lead covered & braided
Main switchboard to Eng. Rm. Workshop D.B. 'N'	1	7/064	40	80	80	V.6.	Lead covered & braided
Main switchboard to Engine Room D.B. 'X'	1	7/064	53	80	220	V.6.	Lead covered & braided
Main switchboard to Engine Room D.B. 'Y'	1	7/044	22	45	120	V.6.	Lead covered & braided
Main switchboard to Engine Room D.B. 'Z'	1	7/044	32	45	120	V.6.	Lead covered & braided
D.B. 'G' to 20 KW. Galley Range.	1	19/064	118.5	143	40	V.6.	Lead covered & braided
D.B. 'G' to 8 KW. Miller	1	7/044	36.4	45	40	V.6.	Lead covered & braided
D.B. 'G' to 5 KW. Bakus Oven.	1	7/044	22.7	45	40	V.6.	Lead covered & braided

J. E. U. "San Salvador" & "San Silvestre"

List of Approved Plans. - Propulsion Equipment.

Drawing No.

Title.

3A5713.

Diagram of Connections.

M 15879/B.

Propulsion Motor Shaft Particulars.

M 16432.

Details of Shaft. O.D. 26x14.

M 19041

Arrangement of Generator S.P.D.R.F. 14x9.

E 1793

Arrangement of Air Ducts etc.

© E 2352

Ventilation of Sliprings.

3A6244

Spans Chart for Auxiliary Elect. Control Gear.

* M 9818

Pedestal Insulation.

* 5-190-117.

Outline Bearing Pedestal Insulation.

L 5532/G.

Outline of Turbo-Alternator.

E 1751/C

Arrangement of Ship Propulsion Motor.

3A5927

Arrgt. of Alternator Resistance.

3C 9877

Earth Leakage Relay.

3C 9714

Diagrammatic Arrgt. of H.T. Connections - Propulsion Equipment.

3B8994

Arrgt. of Alarm & Indicator Unit.

3B8707

Key to be used with Diagram No. 3A5713

3A5805

Cable Layout for Propulsion Gear.

E 1788/B.

Removal & Replacing of Turbo-Rotor.

L 6335

Multicore Cable Runs. Temperature Indicators.

E 1761

Spray Baffles for Turbo-Alternator.

3A6215

Spans Chart for Propulsion Switchgear.

3A6243

Spans Chart for Aux. Elect. Control Gear.

L 8264

Spans Chart.

3A5879

General Arrgt. of Excitation Panel.

3D27201

Earth Leakage Relay.

3A5752

Arrgt. of H.T. Connections. Alternator & Prop. Motor.

3A5727

General Arrgt. of H.T. Section.

3B9027

Diagram of Connections for Alarm & Ind. Panel.

3D27041

Connection Diagram of Excitation Panel.

© E 2352/A.

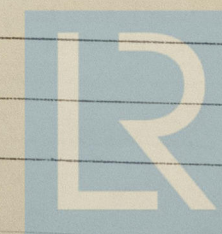
Ventilation of Sliprings - 414 San Silvestre

© E 2352/B.

Ventilation of Sliprings - 445 San Salvador.

* Bearing Pedestal Insulation increased in width to give increased leakage surface.

© Drawing No. E 2352 modified to give increased cooling to sliprings after Works tests. Figures had been examined. See Drawings No. E 2352/A and E 2352/B.



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I. E. V. "San Salvador."

List of Approved Plans:- Auxiliary Circuits.

Drawing No.

Title.

E 2481.

Diagram of Connections for 220 volt circuits

E 2482

Diagram of Connections for 110 volt circuits.

E 2482/A-Z

Book of Diagrams for distribution and
section boxes.

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LIGHTING, HEATING, WIRELESS, NAVIGATION LIGHTS, ETC., CABLES.

240 VOLT
CIRCUITS.

DESCRIPTION.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead plus return feet).	INSULA- TION.	PROTECTIVE COVERING.
	No. in Parallel per Pole.	Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm.	In the Circuit.	Rule.			
S.B. 'G' to 2 KW. Coffee Percolator	1	7/029	6.8	15	40	V.I.R.	Lead covered & braided
S.B. 'G' to 2 KW. Water Boiler.	1	7/029	6.8	15	40	V.I.R.	Lead covered & braided
S.B. 'G' to 2 KW. Steamer	1	7/029	6.8	15	40	V.I.R.	Lead covered & braided
S.B. 'G' to Potato Pail.	1	3/036	1.6	10	40	V.I.R.	Lead covered & braided
Main switchboard to Upper Deck Port. S.B. 'C'	1	7/064	46	80	120	V.I.R.	Lead covered & braided
S.B. 'C' to Poop Deck Port. S.B. 'A'	1	7/064	27	80	50	V.I.R.	Lead covered & braided
Main switchboard to Upper Deck Stbd S.B. 'D'	1	7/064	45	80	80	V.I.R.	Lead covered & braided
S.B. 'D' to Poop Deck Stbd S.B. 'B'	1	7/064	27	80	50	V.I.R.	Lead covered & braided
Main switchboard to Upper Deck Stbd S.B. 'E'	1	7/036	9	24	120	V.I.R.	Lead covered & braided
Main switchboard to Poop Deck Aft. S.B. 'F'	1	19/064	132	143	130	V.I.R.	Lead covered & braided
Main switchboard to Mess Rec. Room S.B. 'H'	1	7/044	23	45	190	V.I.R.	Lead covered & braided
Main switchboard to Engine Room Port S.B. 'J'	1	7/064	51	80	60	V.I.R.	Lead covered & braided
Main switchboard to Engine Room Stbd S.B. 'K'	1	7/064	45	80	60	V.I.R.	Lead covered & braided
Main switchboard to Engine Room S.B. 'L'	1	7/044	34	45	70	V.I.R.	Lead covered & braided
Main switchboard to Sub. switchboard.	2	37/072	391	260	720	V.I.R.	L.b. A. & B.
Main switchboard to Wireless.	1	19/083	30	202	870	V.I.R.	L.b. A. & B. and L.b. & B.
Sub. switchboard to Chart Room C.O. Switch	2	7/036	12	24	120	V.I.R.	L.b. & B.
C.O. Switch to Whulhouse S.B. 'M'	1	7/036	12	24	20	V.I.R.	Lead covered & braided
S.B. 'M' to Navigation Indicator 'N'	1	7/036	1.8	24	20	V.I.R.	Lead covered & braided
Sub. switchboard to Chart Room S.B. 'P'	1	7/044	29	45	110	V.I.R.	Lead covered & braided
Sub. switchboard to Forecastle S.B. 'S'	1	7/044	14	45	420	V.I.R.	L.b. A. & B.
Sub. switchboard to Gyro Compass.	1	7/036	2	24	50	V.I.R.	Lead covered & braided
Sub. switchboard to Echo Sounder.	1	7/036	3	24	100	V.I.R.	Lead covered & braided
Sub. switchboard to Long Range Projector.	1	19/064	50	143	500	V.I.R.	L.b. A. & B.
S.B. 'F' to Eng. mess. Iron Connection.	1	3/029	4	5	200	V.I.R.	Lead covered & braided
S.B. 'L' to Eng. Room Battery Charge Panel.	1	7/029	9	15	70	V.I.R.	Lead covered & braided
S.B. 'L' to "Evening" Panel.	1	7/029	10	15	60	V.I.R.	Lead covered & braided

MOTOR CABLES.

ALL IMPORTANT MOTORS TO BE ENUMERATED.				No.	B.H.P.							
Main Circulating Pumps Fore & Aft.	2	93	1	37/103	354	✓	408	400/400	V.I.R.	Lead covered & braided		
Fire Fighting Pump.	1	75	1	37/083	292	✓	314	240	V.I.R.	Lead covered & braided		
Forward Draught Fans Pt & Stbd.	2	59	1	37/083	230	✓	314	270/270	V.I.R.	Lead covered & braided		
Main Extraction Pumps Pt & Stbd.	2	24	1	19/064	84	✓	143	304/304	V.I.R.	Lead covered & braided		
Mixing Motors Pt & Stbd.	2	15	1	7/064	60	✓	80	184/214	V.I.R.	Lead covered & braided		
Turning Gear Motor.	1	10	1	7/044	41	✓	45	140	V.I.R.	Lead covered & braided		
Cochrane Boiler Fan.	1	7	1	7/044	28.5	✓	45	240	V.I.R.	Lead covered & braided		
Lubricating Oil Pumps Pt & Stbd.	2	6	1	7/044	24	✓	45	260/260	V.I.R.	Lead covered & braided		
Boiler Feed Pump.	1	6	1	7/044	24	✓	45	300	V.I.R.	Lead covered & braided		
Refrigerator Fan	1	0.125	1	3/036			10		V.I.R.	Lead covered & braided		
Refrigerator Compressor	1	6	1	7/044	24	✓	45	80	V.I.R.	Lead covered & braided		
Refrigerator Brine Pump.	1	1.5	1	3/036	6.9	✓	10	160	V.I.R.	Lead covered & braided		
Boat Hoists Port & Stbd	2	7.5	1	7/064	65	✓	80	260/200	V.I.R.	Lead covered & braided		
Boat Hoists Pt & Stbd midships	2	7.5	1	7/064	65	✓	80	150/90	V.I.R.	Lead covered & braided		
Thermolink Fan No.1.	1	3.5	1	7/044	29	✓	45	60	V.I.R.	Lead covered & braided		
Exhaust Fan No.1.	1	1.5	1	7/029	14	✓	15	60	V.I.R.	Lead covered & braided		
Fresh Water Pump.	1	1.5	1	7/029	14	✓	15	60	V.I.R.	Lead covered & braided		
Thermolink Fans Nos. 2 & 3	2	3.5	1	7/044	29	✓	45	50/110	V.I.R.	Lead covered & braided		
Supply Fan No.1	1	3.5	1	7/044	29	✓	45	80	V.I.R.	Lead covered & braided		
Exhaust Fan No.2.	1	3.5	1	7/044	29	✓	45	110	V.I.R.	Lead covered & braided		
Galley Exhaust Fan.	1	0.4	1	3/029			5	110	V.I.R.	Lead covered & braided		
J.W. Pumps Domestic.	1	1.5	1	7/029	14.1	✓	15	224	V.I.R.	Lead covered & braided		
Fuel Oil Pumps Pt & Stbd.	2	4.125	1	7/086	18.7	✓	24	270/270	V.I.R.	Lead covered & braided		
Air Compressor.	1	4.0	1	7/086	16.7	✓	24	30	V.I.R.	Lead covered & braided		
Diesel Gen. Cooling Water.	1	1.5	1	7/029	7	✓	15	100	V.I.R.	Lead covered & braided		
Lub. Oil Purifier.	1	2.5	1	7/029	10.6	✓	15	140	V.I.R.	Lead covered & braided		
Fresh Water Pump Evaporator	1	1.5	1	3/036	7	✓	10	140	V.I.R.	Lead covered & braided		
Diesel Oil Purifier	1	0.5	1	3/036	2.8	✓	10	20	V.I.R.	Lead covered & braided		
Engine Room Vent. Fans Pt & S.	2	4.0	1	7/036	16.3	✓	24	112/112	V.I.R.	Lead covered & braided		
Engine Room Vent. Fans Pt & S.	2	1.6	1	3/036	7.0	✓	10	180/180	V.I.R.	Lead covered & braided		
Laths	1	3.0	1	7/029	13.0	✓	15	60	V.I.R.	Lead covered & braided		
Grinder	1	2.0	1	7/029	9.0	✓	15	60	V.I.R.	Lead covered & braided		
Planing Machine	1	2.0	1	7/029	9.0	✓	15	40	V.I.R.	Lead covered & braided		
Drilling Machine	1	2.0	1	7/029	9.0	✓	15	50	V.I.R.	Lead covered & braided		
Hand Cooling Pump.	1	3.0	1	7/029	12.0	✓	15	300	V.I.R.	Lead covered & braided		
Boiler Drain Pump.	1	2.0	1	7/029	9.0	✓	15	210	V.I.R.	Lead covered & braided		



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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 FURNESS SHIPBUILDING CO. LTD.

E. Heavisides

Electrical Contractors.

Date 10th JAN 1951

COMPASSES.

Have the compasses been adjusted under working conditions. YES

Furness Shipbuilding Co Ltd
P. John H. Frost.

Builder's Signature.

Date 10 Jan 1951

Have the foregoing descriptions and schedules been verified and found correct. YES

Is this installation a duplicate of a previous case. YES If so, state name of vessel "San Liberale"

Plans. Are approved plans forwarded herewith. YES If not, state date of approval -

Certificates. Are certificates of test for motors engaged on essential sea 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 and the arrangements are in accordance with or equivalent to those shown on the approved plans and the Rules for Electrical Equipment. The materials used are of good quality and the workmanship is good.

On completion, the equipment was operated under working conditions, the various protective devices were adjusted and operated, and the insulation resistance of all circuits was measured and found good.

This installation, is in my opinion suitable for a classed vessel intended for the carriage of petroleum in bulk.

Special Notation :- D.F., E.S.D., and Gyro C.

Notes sub 26/1/51

Total Capacity of Generators 950 Kilowatts.

The amount of Fee £129.0.0 SLD A/c 103 : 12 :
Birmingham A/c. 25 : 18 :
When applied for, 17.1.19.51.
When received, 19.

Travelling Expenses (if any) £

Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 9 FEB 1951

Assigned

See F. E. M. 2/51