

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office.....

-2 FEB 1949

Date of writing Report... 31. 12. 1948... When handed in at Local Office... 19... Port of... Liverpool.

No. in Survey held at... Birkenhead... Date, First Survey... Last Survey... 4/12/1948
Reg. Book. (Number of Visits.....)

79001. on the... SS. 'TRIGONOSEMUS'... Tons { Gross 10646, Net 6303

Built at... Portland, Or.... By whom built... Kaiser Co. Inc.... Yard No. -... When built... 1944

Owners... Anglo-Saxon Petroleum Co. Ltd.... Port belonging to... London.

Electrical Installation fitted by... Procured by Builders... Contract No. -... When fitted... 1944

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... No

Have plans been submitted and approved... Approved... System of Distribution... Typical T2 Tombo plans... Voltage of supply for Lighting... 120 AC

Heating... 220 AC... Power... Direct or Alternating Current, Lighting AC.... If Alternating Current state periodicity... 60 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... See note in below.... are they level compounded under working conditions... -

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... No... 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... No... Have certificates of test for machines under 100 kw. been supplied... No... and the results found as per rule... -... Are the lubricating arrangements and the construction of the generators as per rule... Yes... Position of Generators... In main engine room, starting platform.

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 main engine room.

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... Dead-end board, insulation material appears to be American Thyrolex type... 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... of board.... 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... Triple pole circuit breaker for A.C. Generator. Double pole circuit breaker for D.C. Generator.

and for each outgoing circuit... Triple-pole or Double-pole circuit breaker

Are compartments containing switchboards composed of fire-resisting material or lined as per Rule... Yes... Instruments on main switchboard... 14 ammeters... 5 voltmeters... 1 synchronising devices. For compound machines in parallel is the ammeter connected on the pole opposite to the equaliser connection... -... Earth Testing, state means provided... Earth indicating lamps on A.C. & D.C. systems

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... Not tested... are the reversed current protection devices connected on the pole opposite to the equaliser connection... -... have they been tested under working conditions, and at what current did they operate... -... Joint Boxes, Section Boards and Distribution Boards, is the construction and position as per Rule... American Standard

Cables, are they insulated and protected as per the appropriate Tables of the Rules... Cables... 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... -... are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets... heatsink... Are paper insulated and varnished cambric insulated cables sealed at the ends... at ends.

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* Generator sets consist of 400 KVA. Alternators, 75kw. Shunt wound excitors and 55kw. D.C. Generators (Comp. wound.) All mounted on common bedplate and driven by steam turbines.



with insulating compound Yes 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 Yes. State how the cables are supported and protected. All cables L.C.A. - On deck, installed under gangway in conduit; in machinery spaces clipped to saddles, cleats, L-raps, or direct to structure; in accommodation etc., clipped to saddles or direct to structure

Are all lead sheaths, armouring and conduits effectually bonded and earthed Yes. Refrigerated chambers, are the cables and fittings as per Rule 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 effectually bushed Yes and with what material Alternative Lighting, are the groups of lights in the engine and boiler rooms arranged as per Rule Yes. Emergency Supply, state position Emergency generator and method of control Emergency Switchboard inter-connected with main switchboard through C/A switch. 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 Yes, are they adequately ventilated Yes what is the battery capacity in ampere hours Approx 200 amp-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 Yes, if so, how are they protected in flameproof fittings. and where are the controlling switches fitted in accommodation outside spaces, are all fittings suitably ventilated Yes, are all fittings and accessories constructed and installed as per Rule Yes. Searchlight Lamps, No. of 2, whether fixed or portable portable, are their fittings as per Rule Yes. 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 None. 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 Yes and vertically Yes. 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 No. 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 Yes, are all fuses of the cartridge type Yes are they of an approved type Yes. 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. 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.		Fuel Used.	Flash Point of Fuel.
MAIN	2	400 (500kVA)	450	642	Steam Turbine		
	2	75	110	682			
	2	55	120	458			
EMERGENCY	1	75 (92.7kVA)	450	120.5	Oil Engine	Diesel Oil	Above 150° F
PORT GENERATOR	1	50 (41kVA)	450	80	Steam Turbine		

GENERATOR CABLES.

DESCRIPTION.	KILOWATTS.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead from main switchboard, 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	400	1	1,000,000	642	725	40	V.C.	L.C.A.
" " EQUALISER	75	1	1,000,000	682	725	46	"	"
" " "	55	1	750,000	458	592	45	"	"
PORT GENERATOR	50	1	664,000	80	83	120	"	"
EMERGENCY GENERATOR	75	1	1,060,000	120	150	30	"	"
ROTARY TRANSFORMER: MOTOR								
" " GENERATOR								

* EXCITERS FOR PROVISION UNITS.

MAIN DISTRIBUTION CABLES.

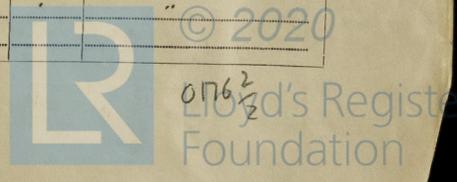
DESCRIPTION.	CONDUCTORS.		MAXIMUM CURRENT IN AMPERES.		APPROX. LENGTH (lead from main switchboard, feet).	INSULATED WITH.	HOW PROTECTED.
	No. in Parallel For Pole.	Sectional Area or No. and Dia. of Strands. Sq. ins. or sq. mm.	In the Circuit.	Rule.			
AUX. SWITCHBOARDS AND SECTION BOARDS		C. cables		Approximate Rating			
Main Switchboard Power Panel (440V)	1	10,400	9.8	25	120	V.C.	L.C.A.
Galley Power (440V main to 15 kWh Transformer)	1	66,400		83	45	"	"
(220V main from Transformer)	1	300,000	14.5	234	150	"	"
Motor Connections	1	650,000		392	45	"	"
Main from 440V Bus Bar to 15 kWh Transformer	1	66,400		83	180	"	"
15 kWh Transformer from Switchboard	1	458,000		308	15	"	"
Substation A.C. Bus Bar to 15 kWh Transformer	1	16,500		34	80	"	"

LIGHTING AND HEATING, ETC., CABLES.

WIRELESS	1	33,100	15	55	300	V.C.	L.C.A.
NAVIGATION LIGHTS	1	10,400	1.5	25	250	"	"
LIGHTING AND HEATING							
Kitchen	1	66,400	30	83	400	"	"
Port/Starboard Deck Accommodation Ltg	1	33,100	20	55	70	"	"
Upper Deck	1	66,400	25	83	100	"	"
Engine Room	1	66,400	15	83	40	"	"
Boiler Room	1	26,300	12	47	80	"	"
Cabin Heating	1	6530	3.4	18	75	"	"
Main Motor	1	6530	13	18	24	"	"
Generator	1	6530	13	18	30	"	"
Battery Charging Generator Room	1	4100	5	15	60	"	"
Generator Room Ltg from 120V A.C. Bus Bar	1	4100	4	15	120	"	"
Engine Room " " 115V D.C. Bus	1	10,400	15	25	100	"	"

MOTOR CABLES.

ALL IMPORTANT MOTORS TO BE ENUMERATED.	No.	B.H.P.						
Eng. Room Vent Fan	4	2	1	6530	3.19	18	60	V.C. L.C.A.
Oil Compressor	1	5	1	6530	7.2	18	30	"
Waste Water Pump	1	3	1	6530	4.5	18	20	"
Eng. Room Bilge Pump	2	10	1	10,400	13.7	25	110	"
Main Condensate Bisc. Pump	1	25	1	300,000	15.5	234	60	"
Main Shaft Teaming Gear	1	5	1	6530	8.5	18	100	"
Main Propulsion Motor Fan	1	15	1	16,500	21	34	75	"
Red Oil Service Pump	2	5	1	6530	7.1	18	60	"
Separator	1	2	1	6530	3.18	18	120	"
Fire Protection Pump	2	50	1	66,400	63	83	60	"
Steaming Gear Motor	2	30	1	33,100	39	55	165	"
Main Condensate Pump	2	25	1	26,300	32	47	50	"
Acc. Circulating	1	30	1	33,100	39	55	90	"
Condensate	1	15	1	16,500	21	34	60	"
Cooling Circulating	1	10	1	10,400	13.7	25	60	"
Fuel Oil	1	7.5	1	6530	10.5	18	45	"
Forward Brought Fans	3	50/20	1	66,400	63/29	83	80	"
Evaporator Fuel Pump	2	1	1	6530	1.5	18	90	"
Accommodation Vent Fans	2	2	1	6530	3.1	18	50	"
Food Water Pumps	2	3	1	6530	3	18	90	"
Rising Compressor	1	7.5	1	6530	10	18	125	"
" Bisc. Pump	1	1	1	6530	1.55	18	150	"
Sanitary Pump	1	7.5	1	6530	10.3	18	125	"
Drinking Water	2	1	1	6530	1.5	18	1200	"
Boiler	3	200	1	450,000	243	308	60	"
Steaming	2	50	1	66,400	63	83	45	"
Fuel Oil Pumps	2	20	1	16,500	25	34	50	"
Salt Water Service	1	10.5	1	6530	10.3	18	150	"



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.

Electrical Engineers. Date.....

COMPASSES.

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

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

The nearest cables to the compasses are as follows:—

A cable carrying 1.5 Ampères 10 feet from standard compass 7 feet from steering compass.

A cable carrying 0.2 Ampères led into feet from standard compass led into 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 degrees on course in the case of the standard compass, and degrees on course in the case of the steering compass.

Builder's Signature. Date.....

Is this installation a duplicate of a previous case..... Generally similar to other 12 Tons. If so, state name of vessel "Vancouver" "F. S. S. S. S."

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.....

General Remarks (State quality of workmanship, whether insulation tests, etc., have been made, opinions as to class, etc.)

The electrical equipment of this vessel appears to have been installed in accordance with American practice and the typical approved plans of 12 Tons. The details of this report were obtained from these plans and from personal observation. A number of repairs and alterations have been effected including the installation of flameproof fittings in cubby-hole spaces, and removal of non flameproof fittings & cables in this space. It was noted that the cargo & shipping pump motor controls are situated near the pump room skylight and it was requested that be removed and fitted in new position in aft accommodation alleyway. Time was not available for this to be done but the Owner's representative states the alteration will be effected at the first opportunity.

The generator motor control gear, transformer, switchgear etc have been examined & checked, necessary repairs effected, insulation test carried out and found satisfactory.

The installation appears to be in good and efficient condition & whilst not strictly in accordance with the Society's Rules, it is in my opinion, eligible to be accepted for classification subject to the cargo & shipping pump motor controls being removed from present location to position in aft accommodation alleyway.

Total Capacity of Generators..... 1035 Kilowatts.
 (The 2.75kw Exciter are not included in total)

The amount of Fee ... £ 30 : 0 : 0

When applied for, 27 JAN 1949

W. H. Affuer

Surveyor to Lloyd's Register of Shipping.

Travelling Expenses (if any) £ : :10.....

When received.

LICENCE CASE

LIVERPOOL - 1 FEB 1949

Committee's Minute

Assigned.....

