

# REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

JAN 15 1938

Date of writing Report 8<sup>th</sup> January 1938 When handed in at Local Office 19 Port of Copenhagen

No. in Survey held at Akershus Date, First Survey 12<sup>th</sup> October Last Survey 17<sup>th</sup> December 1937  
Reg. Book. 37636 on the Single Se. Motor Vessel "COPIAPO" (Number of Visits 12)

Built at Akershus By whom built Isotaksten Skibsverft Yard No. 82 When built 1937  
Tons { Gross 7216.41  
Net 4433.65

Owner Compania Sud Americana de Vapores Port belonging to Valparaiso

Electric Light Installation fitted by The Builders Contract No. - When fitted 1937

Is the Vessel fitted for carrying Petroleum in bulk no.

System of Distribution 2 conductor insulated system.

Pressure of supply for Lighting 220 volts, Heating 220 volts, Power 220 volts.

Direct or Alternating Current, Lighting Direct Power Direct

If alternating current system, state frequency of periods per second -

Has the Automatic Governor been tested and found efficient when the whole load is suddenly thrown on or off yes

Generators, do they comply with the requirements regarding rating yes, are they compound wound yes

are they over compounded 5 per cent. yes, if not compound wound state distance between each generator -

Where more than one generator is fitted are they arranged to run in parallel yes, is an adjustable regulating resistance fitted in series with each shunt field yes

Are all terminals accessible, clearly marked, and furnished with sockets yes, are they so spaced or shielded that they cannot be accidentally earthed, short circuited, or touched yes

Position of Generators Placed in the engine room floor level, are they clear of all inflammable material yes

is the ventilation in way of the generators satisfactory yes, are they clear of all inflammable material yes

if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the generators no wood work etc., are the generators protected from mechanical injury and damage from water, steam or oil yes

are their axes of rotation fore and aft yes

Earthing, are the bedplates and frames of the generating plant efficiently earthed yes, are the prime movers and their respective generators in metallic contact yes

Main Switch Boards, where placed on a platform in the forward end of the engine room

If the generators and main switchboard are not placed in the same compartment, is each generator provided with a fuse on each insulated pole as near as possible to the terminals of the generator, additional to that provided on the main switchboard -

Switchboards, are they placed in accessible positions, free from inflammable gases and acid fumes yes

are they protected from mechanical injury and damage from water, steam or oil yes, if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the switchboards no wood work etc.

are they constructed wholly of durable, non-ignitable non-absorbent materials yes, is all insulation of high dielectric strength and of permanently high insulation resistance yes

if semi-insulating material is used, are all conducting parts insulated from the slab with mica or micaite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework Sindanyo mica

and is the frame effectively earthed yes. Are the fittings as per Rule regarding: - spacing or shielding of live parts

yes, accessibility of all parts yes, absence of fuses on back of board yes, proportion of omnibus bars yes

yes, individual fuses to voltmeter, pilot or earth lamp yes, connections of switches yes

Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches.

For generators: - A 3 pole circuit breaker with overload, reversed current trips

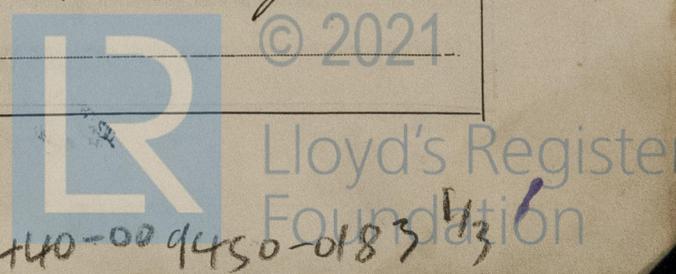
For Outgoing Circuits: - A 2 pole switch with fuse on each pole

Instruments on main switchboard 7 ammeters 5 voltmeters - synchronising device for paralleling purposes.

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system 1 set of earth lamps and 1 voltmeter with ohm scale.

Switches, Circuit Breakers and Fusible Cut-outs, do these comply with the requirements of the Rules. yes

Joint Boxes Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule yes



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**Cables:** Single, twin, concentric, or multicore single are the cables insulated and protected as per Tables IV, V, XI or XIII of the Rules yes

**Fall of Pressure,** state maximum between bus bars and any point of the installation under maximum load about 5 volts

**Cable Sockets and other connections,** are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets yes

**Paper Insulated Cables.** If cables are paper covered, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound yes

**Cable Runs,** are the cables fixed as far as possible in accessible positions not exposed to drip or accumulation of water or oil, or to high temperature from boilers, steam pipes, uptakes or other hot objects, or to avoidable risk of mechanical damage yes

**Support and Protection of Cables,** state how the cables are supported and protected lead covered & wire armoured cables used laid on steel plates & secured by steel clips

If cables are run in wood casings, are the casings and caps secured by screws yes, are the cap screws of brass no, are the cables run in separate grooves no. If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VIII yes

**Refrigerated Chambers,** if lights are fitted, are the cables and fittings in accordance with the special requirements yes

**Joints in Cables,** state if any, and how made, insulated, and protected no joints in cables

**Watertight Glands and Deck Tubes,** are all cables passing through decks and watertight bulkheads provided with deck tubes or watertight glands yes

**Bushes in Beams and Non-watertight Partitions,** where unarmoured cables pass through beams and non-watertight partitions, are the holes efficiently bushed yes state the material of which the bushes are made lead

**Earthing Connections,** state what earthing connections are fitted and their respective sectional areas no, are their connections made as per Rule yes

**Alternative Lighting,** are the groups of lights in the propelling machinery space arranged as per Rule yes

**Emergency Supply,** state position and method of control of the emergency supply and how the generator is driven placed in funnel on boat deck, worked by a 3 cylinder Diesel engine - connected to the light switch board by a change over switch.

**Navigation Lamps,** are these separately wired yes, controlled by separate switch and separate fuses yes, are the fuses double pole yes, are the switches and fuses grouped in a position accessible only to the officers on watch yes, has each navigation lamp an automatic indicator as per Rule yes

**Secondary Batteries,** are they constructed and fitted as per Rule no

**Fittings,** are all fittings on weather decks, in stokeholds and engine rooms and wherever exposed to drip or condensed moisture, watertight yes, are any fittings placed in spaces in which goods are liable to be stacked in close proximity to them; if so, how are they protected yes in holds - protected by strong glass bulbs & metal grids

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected no, how are the cables led no

where are the controlling switches situated no

**Searchlight Lamps,** No. of 1 off, whether fixed or portable fixed, are their fittings as per Rule yes

**Arc Lamps,** other than searchlight lamps, No. of no, are their live parts insulated from the frame or case no, are their fittings as per Rule no

**Motors,** are their working parts readily accessible yes, are the coils self-contained and readily removable for replacement yes, are the brushes, brush holders, terminals and lubricating arrangements as per Rule yes, are the motors placed in well-ventilated compartments in which inflammable gases cannot accumulate and clear of all inflammable material yes, are they protected from mechanical injury and damage from water, steam or oil yes, are their axes of rotation fore and aft yes, if situated near unprotected woodwork or other combustible material, are the motors of the totally enclosed, pipe ventilated, forced draught, drip or flame proof type no wood work, if not of this type, state distance of the combustible material horizontally or vertically above the motors no and no

**Control Gear and Resistances,** are the generator field and motor speed regulators, starters and controllers constructed and fitted as per Rule yes

**Lightning Conductors,** where lightning conductors are required, are these fitted as per Rule yes

**Ships carrying Oil having a Flash Point less than 150° F.** Have the special requirements of the Rules been complied with regarding switches, joint boxes, section and distribution boards, protection of cables, method of distribution, lead of cables, lights and fittings yes  
If portable lamps for use in dangerous spaces are supplied, are they of a type approved by the Home Office yes

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 ...	3	240	220	1090	400	4 cyl 250SA Diesel engine	Crude oil	Above 150°F
AUXILIARY ...								
EMERGENCY ...	1	24	220	109	1000	3 cyl 450SA Turbine Diesel engine	Crude oil	Above 150°F
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT AMPERES.		Approximate Length. (Lead and Return.)	Insulated with	HOW PROTECTED.
	No. per Pole.	Total Effective Area per Pole Sq. mm.	No.	Diameter.	In Circuit.	Rule.			
MAIN GENERATOR ...	3	400	91	2.36	1090	1095	37-18-18	India rubber	Lead covered &
EQUALISER CONNECTIONS	1	240	61	2.24	667	667	18.5-9-9	---	Wire Armoured
FAN SYSTEM 3-4-10	1	150	37	2.27	202	206	12	---	---
EMERGENCY GENERATOR	1	70	19	2.16	109	124	3	---	---
GALLEY SUBORDINATE ROTARY MOTOR	1	35	19	1.53	59	78	19	---	---
TRANSFORMER GENERATOR	1	16	7	1.7	40	49	64	---	---
FAN SYSTEM 3-4-10	1	10	7	1.35	19	38	28	---	---
ENGINE ROOM	1	150	37	2.27	124	206	25	---	---
FAN SYSTEM BOILER ROOM 2-6-7	1	120	37	2.03	175	177	28	---	---
AUXILIARY SWITCHBOARDS	1	4	7	0.85	12	22	22	---	---
Small Sanitary Pumps	2	185	37	2.52	650	670	12	---	---
Winches & Branes aft	1	120	37	2.03	175	177	28	---	---
--- for	2	185	37	2.52	650	670	90	---	---
Refrigerating Motor	2	185	37	2.52	460	464	12	---	---
ACCOMMODATION GALLEY	2	240	61	2.24	520	544	18	---	---
Galley Fans etc	1	150	37	2.27	202	206	12	---	---
Engine room fans	1	120	37	2.03	160	177	24	---	---
Workshop	1	4	7	0.85	16	22	37	---	---
Bilge pumps etc	2	150	37	2.27	404	412	29	---	---
WIRELESS	1	10	7	1.35	30	38	34	---	---
SEARCHLIGHT	1	25	7	2.13	50	65	46	---	---
MASTHEAD LIGHT	1	1.5	1	1.38	-	9	84	165	---
SIDE LIGHTS	1	1.5	1	1.38	-	9	26-26	---	---
COMPASS LIGHTS	1	1.5	1	1.38	-	9	10	---	---
POOP LIGHTS	1	1.5	1	1.38	-	9	175	---	---
CARGO LIGHTS	1	1.5	1	1.38	-	9	18	---	---
PROVISION ROOM AND LAMPS	1	10	7	1.35	16	38	24	---	---
HEATERS & purifiers	1	240	61	2.24	234	272	64	---	---

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT AMPERES.		Approximate Length. (Lead and Return.)	Insulated with	HOW PROTECTED.
		No. Per Pole.	Total Effective Area per Pole Sq. mm.	No.	Diameter.	In Circuit.	Rule.			
BALLAST PUMP	1	1	25	7	2.13	60	65	12	India rubber	Lead covered &
MAIN BILGE LINE PUMPS	1	1	10	7	1.35	36	38	7	---	Wire Armoured
SANIT. CO. 254W. GENERAL SERVICE PUMP	1	1	10	7	1.35	30	38	3	---	---
EMERGENCY BILGE PUMP	1	1	25	7	2.13	50	65	36	---	---
SANITARY PUMP Hot Sea water	1	1	1.5	1	1.38	7	9	3	---	---
CIRC. SEA WATER PUMPS	2	1	95	19	2.53	140	152	2-4	---	---
CIRC. FRESH WATER PUMPS	1	1	95	19	2.53	140	152	8	---	---
Dist. cooling water Air Compressor pumps	1	1	10	7	1.35	28	38	6	---	---
FRESH WATER PUMP - HOT	1	1	1.5	1	1.38	5	9	1	---	---
ENGINE TURNING GEAR	1	1	16	7	1.7	48	49	64	---	---
COLD FRESH W. Sanitary ENGINE REVERSING GEAR	1	1	1.5	1	1.38	8	9	3	---	---
LUBRICATING OIL PUMPS	2	1	185	37	2.52	233	233	47-49	---	---
OIL FUEL TRANSFER PUMP	1	1	95	19	2.53	148	152	61	---	---
WINDLASS	1	1	150	37	2.27	248	280	36	---	---
WINCHES, FORWARD	2	1	70	19	2.16	140	150	12	---	---
Cranes	4	1	50	19	1.83	118	118	6-6-30-30	---	---
WINCHES, AFT	2	1	70	19	2.16	140	150	30-6	---	---
Cranes	2	1	50	19	1.83	118	118	34	---	---
STEERING GEAR	4	1	50	19	1.83	118	118	10-10-30-30	---	---
(a) MOTOR GENERATOR	1	1	95	19	2.53	180	200	98	---	---
(b) MAIN MOTOR	3	1	15-15-4	1-1-7	1.38-0.85	6-8-2	9-22	2-1-1	---	---
WORKSHOP MOTORS	4	1	16	7	1.7	40	49	8-10-34-36	---	---
VENTILATING FANS	4	1	25	7	0.67	10	16	2-4-9-11	---	---
Oil Purifier	1	1	4	7	0.85	12	22	1	---	---
CO2 compressor	2	1	400	91	2.36	380	390	20	---	---
cooling w. pumps	2	1	4	7	0.85	20	22	10-14	---	---
B.P. pumps	2	1	25	7	2.13	56	65	6-6	---	---
CO2 compressor provision	1	1	35	19	1.53	68	78	2	---	---

LIGHTING CONDUCTORS

DESCRIPTION	CONDUCTORS		STRANDS		MAXIMUM CURRENT APPROX.			INSULATION	PROTECTION
	NO PER POLE	SQ. MM	NO	DIAM	CIRCUIT	RULE	LENGTH		
Refriger. Solder	1	6	7	1.05	14	29	1	India rubber	Wire armoured Lead covered
Smoking Saloon	1	10	7	1.35	21	38	22	---	---
I class passengers Pass.	1	6	7	1.05	13	29	20	---	---
III class passengers	1	10	7	1.35	24	38	72	---	---
Engineers	1	6	7	1.05	3.5	29	2	---	---
AFT	1	6	7	1.05	12	29	28	---	---
Engine Telegraphs & compasses	1	2.5	7	0.67	6	16	28	---	---
III class passengers & C. Deck	1	10	7	1.35	19	38	56	---	---
III class Saloon & galley	1	10	7	1.35	16	38	24	---	---
Emergency	1	2.5	7	0.67	6	16	28	---	---
Chart rooms	1	2.5	7	0.67	3	16	46	---	---

MOTOR CONDUCTORS - ETC.

DESCRIPTION	NO OF MOTORS	CONDUCTORS		STRANDS		MAX. CURRENT APPROX.			INSULATION	PROTECTION
		NO PER POLE	SQ. MM	NO	DIAM	CIRCUIT	RULE	LENGTH		
Cooling pump for refry cooling process	1	1	1.5	1	1.38	5	9	8	India rubber	Lead covered wire armoured
Refrigerating fans	2	1	3.5	19	1.53	64	78	16	---	---
---	1	1	1.6	7	1.7	40	49	80	---	---
---	1	1	2.5	7	2.13	48	65	18	---	---
---	1	1	1.0	7	1.35	18	38	80	---	---
Ventilating systems 1-4-5-6-7-8-9-10-11	9	1	1.5	1	1.38	14	9	10-62	---	---
Ventilating systems 2-3	2	1	2.5	7	0.67	6	16	26-36	---	---
Cable space	2	1	2.5	7	0.67	6	16	8-48	---	---
2 Water heaters	-	1	1.6	7	1.7	46	49	3	---	---
Heating table	-	1	2.5	7	0.67	14	16	3	---	---
Coffee boiler	-	1	2.5	7	0.67	14	16	4	---	---
Water heater	-	1	4	7	0.85	16	22	5	---	---
Milk boiler	-	1	2.5	7	0.67	14	16	5	---	---
Toasting apparatus	-	1	2.5	7	0.67	12	16	5	---	---
Refriger. Mch. in Bar	-	1	1.5	1	1.38	1	9	24	---	---
Heating table	-	1	6	7	1.05	27	29	10	---	---
Sounding Machine	1	1	1.5	1	1.38	6	9	62	---	---
Galley range	-	1	240	61	2.24	272	272	5	---	---
Baking oven	-	1	16	7	1.7	46	49	8	---	---
Potato boiler	-	1	10	7	1.35	32	38	14	---	---
Cooking boiler	-	1	10	7	1.35	32	38	14	---	---
Dough mixer	1	1	1.5	1	1.38	8	9	6	---	---
Coffee boiler	-	1	4	7	0.85	18	22	12	---	---
Heating table	-	1	6	7	1.05	23	29	10	---	---
Water heater	-	1	4	7	0.85	18	22	12	---	---
Sounding Machine	1	1	1.5	1	1.38	4	9	4	---	---
Potato Boiler	-	1	10	7	1.35	32	38	14	---	---
Boiler	-	1	2.5	7	0.67	14	16	6	---	---

The foregoing is a correct description

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 AKTIESELSKABET NAKSKOV SKIBSVÆRFT  
 Copenhagen

13 10433

All Conductors are of annealed copper conforming to British Standard Specification No. 7.  
The Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules.  
The foregoing is a correct description.

AKTIESELSKABET  
NAKSKOV SKIBSVÆRFT

Electrical Engineers.

Date

*W. M. Hansen*

COMPASSES.

*Search light*  
Distance between electric generators or motors and standard compass *3 m*  
Distance between electric generators or motors and steering compass *4 m*  
The nearest cables to the compasses are as follows:— *Non-magnetic system in the*  
A cable carrying *0.07* Ampères *7 inches* feet from standard compass feet from steering compass.  
A cable carrying *0.07* Ampères feet from standard compass feet from steering compass. *Non-magnetic system in the*  
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 *0* degrees on *any* course in the case of the standard compass, and *0* degrees on *any* course in the case of the steering compass.

AKTIESELSKABET  
NAKSKOV SKIBSVÆRFT

Builder's Signature.

Date

*W. M. Hansen*

Is this installation a duplicate of a previous case *no* If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c. *The electric installation as*)

*described herein has been constructed and fitted under special survey in accordance with the Rules the approved plans and the requirements contained in the Secretary's letter E dated 2/2 - 9/2 - 29/8 - 1937. The machinery over 100 HP has been built under special survey.*

*The material used in construction is in accordance with the Rules and the workmanship is good.*

*On completion the whole installation was tested under full power working conditions - found satisfactory.*

*W. M. Hansen*  
*18/1/38.*

Total Capacity of Generators *744* Kilowatts.

The amount of Fee *Fr 1424.64* } When applied for, 14.1.38.  
Travelling Expenses (if any) £ : : } When received, 8/2.38  
*gmk 9/2*

*J. Langkilde Jensen*  
Surveyor Lloyd's Register of Shipping.

Committee's Minute *FRI 28 JAN 1938*

Assigned

*See Opn. No. 10433*

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



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