

Rpt. 13.

No. 3729

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

29 APR 1948

Received at London Office

Date of writing Report 19... When handed in at Local Office 19... Port of Seattle, Washington

No. in Survey held at Seattle, Washington Date, First Survey Oct. 13, 1947 Last Survey February 20, 1948
 Reg. Book. (Number of Visits 26)

22619 on the SS. "MINERVE" (ex "Donner Lake") Tons { Gross 10448
 Net 6301

Built at Portland, Oregon By whom built Kaiser Company, Inc. Yard No. P 66 When built 1944

Owners French Government Port belonging to LeHavre (Contemplated)

Electric Light Installation fitted by Kaiser Co. Inc. Contract No. --- When fitted 1944

Is the Vessel fitted for carrying Petroleum in bulk Yes

System of Distribution Alternating Current 3 Phase 3 Wire

Pressure of supply for Lighting 115 volts, Cooling 230 volts, Heating 230 volts, Power 450 volts.

Direct or Alternating Current, Lighting Alternating Power Alternating

If alternating current system, state frequency of periods per second 60 Cycles / 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 temperature rise A.I.E.E. Standards, are they compound wound 55 KW. Exciters only
 are they over compounded 5 per cent -, if not compound wound state distance between each generator 8 feet

Where more than one generator is fitted are they arranged to run in parallel Yes 400 Kws Sets, is an adjustable regulating resistance fitted in series with each shunt field of exciters, Yes
 Have certificates of test results for machines under 100 kw. been submitted and approved - Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing By A.B.S.

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 Are the lubricating arrangements of the generators as per Rule Yes

Position of Generators In Engine Room Starboard side, 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 - and -, 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 In 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 - and -, 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, is it of an approved type Yes, if semi-insulating material is used, are all conducting parts insulated from the slab with mica or micanite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework -, is the non-hygroscopic insulating material of an approved type Yes, and is the frame effectively earthed Yes Are the fittings as per Rule regarding:—spacing or shielding of live parts

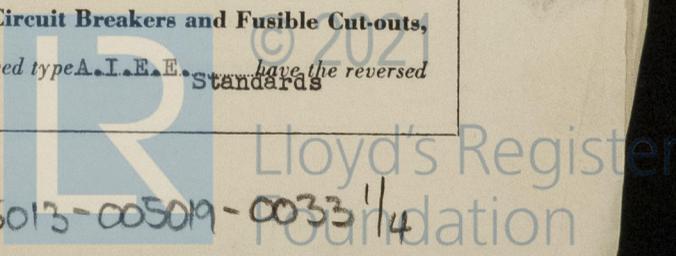
A.I.E.E. Standards, accessibility of all parts A.I.E.E. Standards, absence of fuses on back of board Yes, temperature rise of omnibus bars A.I.E.E. Standards, individual fuses to voltmeter, pilot or earth lamp Yes, are moving parts of switches alive in the "off" position No are all screws and nuts securing connections effectively locked Yes are any fuses fitted on the live side of switches No

Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches 400 Kws generators: Three pole linked circuit breakers with overloads and reverse power trips and three pole isolating switches, 55 Kws exciters; D.P. linked breaker with overloads and selector switch, 75 Kws exciters D.P. D.T. switch. Outgoing circuits, two and three pole linked circuit breakers.

Are turbine driven generators fitted with emergency trip switch as per rule - Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material Yes Instruments on main switchboard 400 Kws sets 4
2300 volt panel 7
10 ammeters 3 voltmeters 1 synchronizing device for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equalizer connection -

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system -

Earth Lamps - Switches, Circuit Breakers and Fusible Cut-outs, do these comply with the requirements of the Rules A.I.E.E. Standards are the fusible cutouts of an approved type A.I.E.E. Standards have the reversed



current protection devices been tested under working conditions. **Yes** Joint Boxes, Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule. **A.I.E.E. Standards**

Cables: Single, twin, concentric, or multicore. **Yes** are the cables insulated and protected as per Tables IV, V, X or XI of the Rules. **A.I.E.E. Standards**

If the cables are insulated otherwise than as per Rule, are they of an approved type. **Yes** Fall of Pressure, state maximum between bus bars and any point of the installation under maximum load. **Cable Sockets**, are the ends of all cables having a sectional area of 0.04 square inch and above provided with **soldering sockets**. **Yes** Paper Insulated and Varnished Cambric Insulated Cables.

If conductors are paper or varnished cambric insulated, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound. **Yes** or waterproof insulating tape. **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** Are cables in machinery spaces, galleys, laundries, bathrooms and lavatories lead covered or run in conduit. **Lead covered**

Support and Protection of Cables, state how the cables are supported and protected. **Main feeder cables lead covered and basket weave armoured run in conduit on deck supported by straps under fore and aft walk way. Cables in accommodation and engine room clipped to brackets and bulkheads. Main propulsion cables supported on cleats.**

If cables are run in wood casings, are the casings and caps secured by screws. **Yes** are the cap screws of brass. **Yes** are the cables run in separate grooves. **Yes** If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VIII. **A.I.E.E. Standards**

Refrigerated Chambers, are the cables and fittings in accordance with the special requirements. **Yes**

Joints in Cables, state if any, and how made, insulated, and protected. **In junction boxes**

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 bushes and steel collars**

Earthing Connections, state what earthing connections are fitted and their respective sectional areas. **Cables effectively earthed**

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. **Diesel driven emergency generator. In engine room poop deck level, which can be connected to main aux. bus bars through contractors interlocked with two 400 Kws. aux. generator sets so that it cannot be closed until the breakers of these sets have been tripped.**

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. **wheelhouse**

has each navigation lamp an automatic indicator as per Rule. **Yes** Secondary Batteries, are they constructed and fitted as per Rule. **Yes**

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**

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected. **Bulkhead**

fittings in pump rooms. **Yes** how are the cables led **Outside the compartments**

where are the controlling switches situated. **Outside the compartments**

are all fittings suitably ventilated. **Yes** are all switches and lampholders constructed wholly of non-ignitable, non-absorbent materials. **Yes**

Heating and Cooking Appliances, are they constructed and fitted as per Rule. **A.I.E.E. Standards** are air heaters constructed and fitted as per Rule. **Yes**

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

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

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. **A.I.E.E. Standards** 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. **where possible** 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. **Drip proof and totally enclosed** if not of this type, state distance of the combustible material horizontally or vertically above the motors. **—** and **—**

have machines of over 100 BPH been inspected by the Surveyors during manufacture and testing. **Yes** Control Gear and Resistances, are the generator field and motor speed regulators, starters and controllers constructed and fitted as per Rule. **A.I.E.E. Standards** 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** are all fuses of the filled cartridge type. **Yes** are they of an approved type. **A.I.E.E. Standards**

If portable lamps for use in dangerous spaces are supplied, are they of a self-contained, battery-fed type approved by the Home Office. **Yes**

Spare Gear, if the vessel is for open sea service have spares been supplied as per Rule. **Yes**

The relay is connected to a current transformer whose primary is in series with the connection by means of which the generator neutral is grounded. This relay can be set to trip at ampere values of .5 to 2.5 amps. When a phase becomes grounded, current flows into the grounds neutral and energizes the ground relay which operates and closes its contacts thus removing the excitation. A resistor limits ground current to 20 amperes. No aural device is fitted, but no exception has been taken in this instance.

The plans attached have been examined and found to be in accordance with A.I.E.E. Standards and generally in accordance with the Rules except as noted hereafter.

- (1) No overload or short circuit protection is provided on main propulsion units.
- (2) No overload or short circuit protection is provided on the 75 KWS. exciter generators used for main propulsion excitation.
- (3) Main propulsion cable have no lead alley sheath as required by the Rules. The dimensions in this report have been taken from the attached plans. These dimensions have been checked as far as possible on the ship and found correct.

The materials and workmanship are good and the installation has been examined under working conditions and found to be satisfactory.

In our opinion, the electrical installation is such as could be accepted by the Committee for classification.

J.R.

DESCRIPTION	No. of Motors	No. Per Pole	Total Nominal Area Per Pole	STRAND		AMPS.		App. Length Lead & Return	Insulated With	HOW PROTECTED
				No.	Diameter	Circuit	A.I.E.E. Rule			
(each)										
2-Stripping Pumps	1	1	.0521	7	.097	61 ✓	99 ^x	-	V.C.	L.C. & Basket Weave Armoured
3-Cargo Pumps (ea.)	1	1	.3535	37	.110	243 ✓	367 ^x	-	"	"
Aux.Circ.Pump P14	1	1	.0261	7	.068	40 ✓	65 ^x	-	"	"
P12 & P13 (each)										
2-Main condensate Pumps Fwd. & Aft (each)	1	1	.0521	7	.097	31 ✓	55.5 ^x	-	"	"
2- Fire Pumps P7 & P8 P36 & 37 (each)	1	1	.0521	7	.097	60.5 ✓	99 ^x	-	"	"
2- Eng.Rm. Vent Fans P.38	1	1	.0051	7	.030	3 ✓	22 ^x	-	"	"
Refrig.Power	-	1	.0082	7	.038	23 ✓	30 ^x	-	"	"
2-Refrig Comp RS (ea)	1	1	.0051	7	.030	9.8 ✓	22 ^x	-	"	"
Refrig. Circ Pump P39 Atmos	1	1	.0051	7	.030	1 ✓	22 ^x	-	"	"
Drain & Rec. Pump P41	1	1	.0051	7	.030	3 ✓	22 ^x	-	"	"
Salt water Pump P45 Aft	1	1	.0051	7	.030	11 ✓	22 ^x	-	"	"
Drinking Water Pump P46	1	1	.0051	7	.030	1.6 ✓	22 ^x	-	"	"
Drinking Water Pump	1	1	.0051	7	.030	1.6 ✓	22 ^x	-	"	"
Sounding Machine P47	1	1	.0032	7	.024	1.6 ✓	22 ^x	-	"	"
Main Motor cooling fan	1	1	.013	7	.048	20 ✓	41 ^x	-	"	"
Shaft Turning gear P51	1	1	.0051	7	.030	7.5 ✓	22 ^x	-	"	"
Combustion Control 54	1	1	.013	7	.048	20 ✓	41 ^x	-	"	"
Pump Rm.Exh Blower	1	1	.0051	7	.030	2 ✓	22 ^x	-	"	"
Lathe	1	1	.0051	7	.030	3 ✓	22 ^x	-	"	"
Drill Press	1	1	.0051	7	.030	1.6 ✓	22 ^x	-	"	"
Grinder	1	1	.0051	7	.030	4.5 ✓	22 ^x	-	"	"

JFR.



© 2021

Lloyd's Register Foundation

0033 3/4

PARTICULARS OF GENERATING PLANT.

DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Amperes.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN ...	2	400	450	642	1200	Steam Turbine	-	-
Exciters	2	75	110	682	1200	Steam Turbine	-	-
Exciters	2	55	120	458	1200	" "	-	-
Emergency	1	75	450	120.5	720	Diesel Engine	Diesel oil above 150°P.	
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT. AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED
	No. per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	Circuit.	A.I.E.E.			
MAIN GENERATOR	1	.7854	61	.128	642	864	-	V.C.	L.C.& Basket Weave Armoured
75 Kws exciters	1	.7854	61	.128	682	864	-	"	" " " " " "
55 Kws exciters	1	.5890	61	.110	458	705	-	"	" " " " " "
5400 Kws Propulsion	2	2.3562	91	.128	1315	2272	-	"	Bronze Tape
6600 H.P. Propulsion	2	2.3562	91	.128	1160	2272	-	"	" "
2300/450 volts TRANSFORMER	1	.1318	19	.094	151	185	-	"	" "
ENGINE ROOM L6	1	.0521	7	.097	70	99	-	"	L.C.& Basket Weave Armoured
BOILER ROOM L7	1	.0206	7	.061	35	55.5	-	"	" " " " " "
Emergency	1	.1045	19	.083	150	158	-	"	" " " " " "
440/230 volts P.33	1	.0521	7	.097	58	99	-	"	" " " " " "
Galley transformers	1	.5100	61	.103	600	466	-	"	" " " " " "
440 volts Shore Conn.	1	.0521	7	.097	70	99	-	"	" " " " " "
Midship & Feeds Lts. L3	1	.0261	7	.068	50	65	-	"	" " " " " "
Boat Dk. Qrts. Itg. L.4	1	.0521	7	.097	70	99	-	"	" " " " " "
Upper Dk. Qrts. Itg. L.5	1	.1045	19	.083	120.5	158	-	"	" " " " " "
Emergency Generator	1	.0032	7	.024	15	11.5	-	R.I.	" " " " " "
Battery charger	1	.0521	7	.097	70	99	-	V.C.	" " " " " "
450/120 volts Itg.	1	.0082	7	.038	25	30	-	V.C.	" " " " " "
Transformers	1	.0521	7	.097	70	99	-	V.C.	" " " " " "
Navigation Itg. L.E.I.	1	.0082	7	.038	25	30	-	V.C.	" " " " " "
WIRELESS	1	.0261	7	.068	50	65	-	"	" " " " " "
SEARCHLIGHT 1000 W.	1	.0051	7	.030	10	16.5	-	R.I.	" " " " " "
MASTHEAD LIGHT	1	.0032	7	.024	.45	11.5	-	R.I.	" " " " " "
SIDE LIGHTS	1	.0032	7	.024	.45	11.5	-	R.I.	" " " " " "
110 volts Shore Conn.	1	.5100	61	.103	400	466	-	V.C.	" " " " " "
POOP LIGHTS	1	.0082	7	.038	15	30	-	V.C.	" " " " " "
Gyro Compass	1	.0414	7	.086	55	88	-	"	" " " " " "
Galley Ranges	1	.013	7	.048	24	41	-	"	" " " " " "

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT. AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED
		No. per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	A.I.E.E.			
BALLAST PUMP P.43 - 44 (each)	1	1	.008	7	.038	14.5	30	-	V.C.	" " " " " "
MAIN BILGE LINE PUMPS										
GENERAL SERVICE PUMP										
EMERGENCY BILGE PUMP										
SANITARY PUMP P.42	1	1	.0051	7	.030	11	22	-	" "	" " " " " "
CIRC. SEA WATER PUMPS P.6	1	1	.2356	.37	.090	150	279	-	" "	" " " " " "
CIRC. FRESH WATER PUMPS										
AIR COMPRESSOR P.40	1	1	.0051	7	.030	6.9	22	-	"	" " " " " "
FRESH WATER PUMP (each) P.31 & 32	1	1	.0051	7	.030	3	22	-	"	" " " " " "
ENGINE TURNING GEAR P.48	1	1	.0051	7	.030	4.5	22	-	"	" " " " " "
ENGINE REVERSING GEAR										
LUBRICATING OIL PUMPS (ea.) P.20 & 21	1	1	.0051	7	.030	7.5	22	-	"	" " " " " "
OIL FUEL TRANSFER PUMP P.16 & 17 (ea)	1	1	.013	7	.048	11	41	-	"	" " " " " "
WATER SERVICE PUMPS P.18 & 19 (ea)	1	1	.0051	7	.030	11	22	-	"	" " " " " "
WINCHES, FORWARD										
WINCHES, AFT										
STEERING GEAR—										
(a) MOTOR GENERATOR P.9 & 10										
(b) MAIN MOTORS (ea.)	1	1	.0206	7	.061	46	55.5	-	"	" " " " " "
WORKSHOP MOTORS P.11										
VENTILATING FANS P.34 & 35	1	1	.0051	7	.030	3	22	-	"	" " " " " "
VENTILATION P.27 & 28 (ea) P.26	1	1	.0051	7	.030	2.5	22	-	"	" " " " " "
Evap. Feed Pumps P.23, P.24 & P.25 (ea.)	1	1	.0051	7	.030	1.6	22	-	"	" " " " " "
Ported draught	1	1	.0829	19	.074	64	134	-	"	" " " " " "
Lub. Oil Separator	1	1	.0051	7	.030	3	22	-	"	" " " " " "
ux. Condensate Pump P.15	1	1	.013	7	.048	30	41	-	"	" " " " " "

) American Institute of Electrical Engineers current rating for two and three conductor cables, table No. 9)

© 2021 Lloyd's Register Foundation
0033 4/4

All Conductors are of annealed copper conforming to British Standard Specification No. 7 (or International Electro-technical Commission Publication No. 28).

The Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules.

The foregoing is a correct description.

Electrical Engineers.

Date

COMPASSES.

Distance between electric generators or motors and standard compass 26 feet

Distance between electric generators or motors and steering compass 20 feet

The nearest cables to the compasses are as follows:—

A cable carrying .25 Ampères .75 feet from standard compass .75 feet from steering compass.

A cable carrying 1 Ampères 6 feet from standard compass 4 feet from steering compass.

A cable carrying 10 Ampères 6 feet from standard compass 6 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 Nil degrees on Any course in the case of the standard compass, and Nil degrees on Any course in the case of the steering compass.

Builder's Signature.

Date

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

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

Classing

The electrical installation to the requirements of the American Bureau of Shipping has been in operation since 1944. The vessel is propelled by electric machinery consisting of a turbine driven totally enclosed alternator (with surface air cooler), 4925/5400 KWS, 2300/2370 volts, 1237/1315 amps, 100% P.F., 3 phase, 60/62 cycles, 3600/3715 R. P.M., 110 volts excitation, armature temperature rise by imbedded detector 60°C, field temperature rise by resistance 85°C, and a motor (forced ventilated) 6000 H.P., 2300 volts, 1160 amps, 100% P.F., 3 phase, 60 cycles, 90 R.P.M., 120 volts excitation, armature temperature rise by imbedded detector 80°C, field temperature rise by resistance 60°C, both connected by necessary control switch gear.

The motor operates as an induction motor during starting and reversing periods, and during such operations, the motor field winding is closed through the motor field discharge resistor. The operation of the control gear equipment is from the engine room. For the protection of the equipment, the following items are fitted:

- (a) Motor or generator field temperature indicator with selector switch. No aural alarm has been fitted to indicate when the temperature exceeds that allowable, but no exception has been taken in this instance.
- (b) Motor or generator stator temperature indicator with selector switches.
- (c) Phase balance relay to protect against unbalancing or single phase operation. This relay operates when the current unbalance reaches 25%.
- (d) Ground detecting relay provides protection in event of faults between any one of the 3 phases to ground.

Total Capacity of Generators 6535 Kilowatts. 725

The amount of Fee ... £ \$ 550.00 When applied for, Feb. 20 19 48
Traveling Expenses (if any) £ : : When received, 19

Noted SW
11/2/48

James A. Robertson
Surveyor to Lloyd's Register of Shipping.

Committee's Minute

NEW YORK APR 7 1948

Assigned Elec light

SW



© 2021

Lloyd's Register Foundation