

# REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

21 AUG 1935

Received at London Office

Date of writing Report 8/8 1935 When handed in at Local Office Odense Port of Copenhagen  
 No. in Survey held at Odense Date, First Survey 31/5 1935 Last Survey 2/8 1935  
 Reg. Book. 38752 on the Twin S. Motor Tugs "KROSSFONN" (Number of Visits 8) Tons { Gross 9323  
 Net 5550  
 Built at Odense By whom built Odense Haaskibsvaerft No. 56 When built 1935  
 Owners Skibskompagni "Dalforn" Port belonging to Skavanger  
 Electric Light Installation fitted by Dansk Elektriske Kompagni Contract No.          When fitted 1935  
 Is the Vessel fitted for carrying Petroleum in bulk Yes.

System of Distribution Two conductor insulated system.  
 Pressure of supply for Lighting 110 volts, Heating          volts, Power 220 & 110 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 temperature rise 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.  
 Have certificates of test results for machines under 100 kw. been submitted and approved Yes. Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing         

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 plates in the motor room, port, starboard & center, 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.

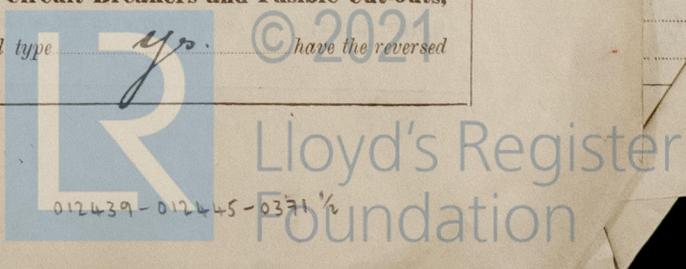
Earthing, are the bedplates and frames of the generating plant efficiently earthed Yes. are the prime movers and their respective generators in metallic contact Yes. Main Switch Boards, where placed on a platform aft in the motor room  
 If the generators and main switchboard are not placed in the same 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 micamite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework Yes., 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 Yes., accessibility of all parts Yes., absence of fuses on back of board Yes., temperature rise of omnibus bars Yes., 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  
 GENERATORS: 1 2-BLE POLE LINKED CIRCUIT BREAKER W. OVERLOAD & REVERSED CURRENT TRIP AND EQUALIZER AS PER SECT. 3 A. 1.  
 OUTGOING CIRCUITS: 1 2 BLE POLE LINKED SWITCH AND A FUSE ON EACH POLE.

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 6 ammeters 4 voltmeters          synchronising device for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connection         

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system 2 sets of earth lamps, 1 Voltmeter with 2 scale Switches, Circuit Breakers and Fusible Cut-outs, do these comply with the requirements of the Rules Yes. are the fusible cutouts of an approved type Yes. 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 *Yes.*

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

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 *3.5 Volts.* **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 *Yes.*

**Support and Protection of Cables,** state how the cables are supported and protected *armoured cables used supported by galv. steel clips, when necessary laid in the tubes or steel casing*

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 *Yes.*

**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 *None.*

**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 *Yes.* 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 *Yes.*

**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 *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 *the lamps in the pump room are contained in gaslight glass globes protected by steel grids, how are the cables led through gaslight steel tubes, carried into fittings.* where are the controlling switches situated *in the deck house amidships.*

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 *Yes.* are air heaters constructed and fitted as per Rule *Yes.*

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

**Arc Lamps,** other than searchlight lamps, No. of *Yes.* 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 *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 *Yes.* if not of this type, state distance of the combustible material horizontally or vertically above the motors *Yes.* and *Yes.*

have machines of over 100 BHP 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 *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.* are all fuses of the filled cartridge type *Yes.* are they of an approved type *Yes.*

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.*

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	66	220	300	320	30% 2 cyl. 25. C.S.A. DIESEL ENG.	crude oil	210° F	
AUXILIARY	1	8	110	72.6	650	Steam			
EMERGENCY									
ROTARY TRANSFORMER	1	25	110	227	1425	off 38 HP electric motor			

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. mm.	No.	Diameter.	Circuit.	Rule.			
MAIN GENERATOR	1	275	61	2.39	300	295	82	india rubber	lead covered
EQUALISER CONNECTIONS		150	37	2.27		205	41	"	and steel wire
AUXILIARY GENERATOR									armoured
EMERGENCY GENERATOR									when necessary
ROTARY TRANSFORMER MOTOR	1	95	19	2.52	130	147	44	"	lead in steel
GENERATOR	1	185	37	2.52	227	233	44	"	tubes.
ENGINE ROOM	1	10	7	1.35	20	38	6	"	"
BOILER ROOM									
AUXILIARY SWITCHBOARDS	1	2.5	7	0.67	5	15	260	"	"
NAVIGATION									
ACCOMMODATION									
AFT	1	25	7	2.13	30	63	100	"	"
DECKHOUSE	1	50	19	1.83	40	98	260	"	"
FORWARD	1	35	19	1.53	40	77	280	"	"
WIRELESS	1	16	7	1.70	12	48.7	260	"	"
SEARCHLIGHT									
MASTHEAD LIGHT	1	1.5	1	1.38	0.5	10	120	"	"
SIDE LIGHTS	1	1.5	1	1.38	0.5	10	30	"	"
COMPASS LIGHTS	1	1.5	1	1.38	0.5	10	30	"	"
POOP LIGHTS	1	1.5	1	1.38	0.5	10	180	"	"
CARGO LIGHTS									
ARC LAMPS									
HEATERS									

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. mm.	No.	Diameter.	In Circuit.	Rule.			
BALLAST PUMP	1	1	16	7	1.70	34	48.7	54	india	lead covered
AUXIL. ENG. COOLING MAIN-BILGE LIME PUMPS	1	1	2.5	7	0.67	10	15	22	rubber	and steel
GENERAL SERVICE PUMP										when necessary
EMERGENCY BILGE PUMP AND										when necessary
SANITARY PUMP	1	1	16	7	1.70	34	48.7	54	"	lead in galv.
CO2 CONDENSER	1	1	2.5	7	0.67	7	15	22	"	steel tubes.
CIRC. SEA WATER PUMPS	1	1	2.5	7	0.67	7	15	22	"	"
FUEL OIL	1	1	2.5	7	0.67	7	15	22	"	"
CIRC. BILGE WATER PUMPS	1	1	10	7	1.35	28	38	50	"	"
CO2 COMPRESSOR	1	1	2.5	7	0.67	10	15	33	"	"
FRESH WATER PUMP	1	1	2.5	7	0.67	10	15	33	"	"
ENGINE TURNING GEAR	2	1	35	19	1.53	51	77	42	"	"
ENGINE REVERSING GEAR										"
COOLING WATER AND LUBRICATING OIL PUMPS	2	1	120	37	2.03	150	177	50	"	"
OIL FUEL TRANSFER PUMP	1	1	16	7	1.70	34	48.7	98	"	"
WINDLASS										"
WINCHES, FORWARD										"
WINCHES, AFT										"
STEERING GEAR—										"
(a) MOTOR GENERATOR										"
(b) MAIN MOTOR	1	1	50	19	1.83	115	115	100	"	"
WORKSHOP MOTOR	1	1	10	7	1.35	30	38	34	"	"
VENTILATING FANS										"
LUBR. OIL PURIFIERS	2	1	2.5	7	0.67	10	15	40	"	"
FUEL OIL - "	1	1	2.5	7	0.67	12	15	40	"	"

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.

*Dansk Elektricitetscompagni*  
*Aktieselskab Lyngby*

Electrical Engineers.

Date 15-8-1935.

COMPASSES.

Distance between electric generators or motors and standard compass 25'

Distance between electric generators or motors and steering compass 18'

The nearest cables to the compasses are as follows:—

A cable carrying 5 Ampères 12 feet from standard compass 12 feet from steering compass.

A cable carrying 0.5 Ampères 8" feet from standard compass 8" 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 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.

PR. ODENSE STAALSKIBSVÆRFT

VED A. P. MØLLER

*John August Nielsen*

Builder's Signature.

Date 16.8.35

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, etc.)

The electric light & power installation as herein described has been fitted in accordance with the Society's Rules, the approved plans and the requirements contained in the Secretary's letter E dated 17/6 1935.

The material used is of good description throughout and the workmanship is good.

On completion the whole installation was tested as per Rules and found satisfactory.

*Noted*  
*L. J.*  
*22/8/35*

Total Capacity of Generators 206 Kilowatts.

The amount of Fee ...

11820.96

When applied for,

2/8 1935

Travelling Expenses (if any) £

When received,

26.8.35

*Chubb*  
Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI, 23 AUG 1935

Assigned

*See minute on*  
*H. Rpt*

2m. 5.31. — Transfer.  
The Surveyors are requested not to write on or below the space for Committee's Minute.



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