

REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office.

Date of writing Report 12th Decbr. 1923 When handed in at Local Office

10 Port of Copenhagen

No. in Survey held at Copenhagen Date, First Survey 23rd August Last Survey 16th Novbr. 1923.
 Reg. Book. (Number of Visits 27.)
 40225 on the Steel Twin Screw Motor Vessel "Nordbo"
 akt. Burmeister & Wain's
 Built at Copenhagen By whom built Maskin- og Skibsbyggeri Yard No. 327 When built 1923.
 Owners akt. Dampskibsselskabet Nordstjern (P. Brown jun. & Co) Port belonging to Copenhagen
 Electric Light Installation fitted by akt. Burmeister & Wain's Maskin- og Skibsbyggeri Contract No. 327 When fitted 1923.

System of Distribution Two-wire direct current insulated system.

Pressure of supply for Lighting 110 volts, Heating ✓ 220 volts, Power

Direct or Alternating Current, Lighting Direct current Power

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 overload Yes, are they compound wound Yes.

are they over compounded 5 per cent. No, o per cent, 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 and clearly marked Yes, are they so spaced or shielded that they cannot be accidentally earthed, or short circuited

Are the lubricating arrangements of the generators as per Rule Yes.

Position of Generators On port side of the engine room. , 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 Not situated near unprotected wood work, or other combustible and material, are the generators protected from mechanical injury and damage from water, steam or oil Yes.

are their axis of rotation fore and aft Yes. , are the prime movers and

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. , are the prime movers and

Main Switch Boards, where placed In 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. , if situated near unprotected

are they protected from mechanical injury and damage from water, steam or oil Yes. , if situated near unprotected woodwork

woodwork or other combustible material, state distance of same horizontally from or vertically above the switchboards or other combustible and material.

are they constructed wholly of durable, incombustible non-absorbent materials A marble plate used, is all insulation of high dielectric strength and of

permanently high insulation resistance Yes, if semi-insulating material is used, are all conducting parts connected to one pole

insulated from the slab with mica or micanite and the slab similarly insulated from its framework Yes. , and is the

frame effectively earthed Yes. Are the following fittings as per Rule, viz.:— spacing or shielding of live parts

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

bars 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 each generator:-

A double-pole breaker with overload and reversed current trips, coupled with a single-pole equalizer switch

as required by the Rules. — For each outgoing circuit:- a double-pole linked switch and a double-pole fuse. ✓

5 ✓ ammeters 4 ✓ voltmeters ✓ synchronising device for paralleling purposes.

Instruments on main switchboard



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

provided with an Ohm scale and the switchboard is provided with two earth lamps. ✓

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

Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule Yes. ✓

Insulation of Cables, state type of cables, single or twin Both types are the cables insulated and protected as per Tables III or IV of the Rules. Table III

Fall of Pressure, state maximum between bus bars and any point of the installation under maximum load 3 Volts.

Cable Sockets and other connections, are the ends of all cables having a sectional area of 0.007 square inch and above provided with soldering sockets Under 10 mm² soldering sockets, - above 10 mm² cable sockets with screws.

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 No paper insulated cables used.

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 Wire armoured cables used, protected by sheet iron or fitted in tubes.

If cables are run in wood casings, are the casings and caps secured by screws No, are the cap screws of brass ✓, are the cables run in separate grooves ✓. If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VI 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 Watertight junction boxes with bowed covers and connections used.

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 Positions, 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 earthing connections.

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

Emergency Supply, state position and method of control of the emergency supply and how the generator is driven ✓

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., are separate screens provided for the use of oil and electric side lights Yes.

are separate oil lanterns provided for the mast head lights and side lights 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 No.

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

where are the controlling switches situated ✓

Searchlight Lamps, No. of None, whether fixed or portable ✓, are their fittings as per Rule ✓

Arc Lamps, other than searchlight lamps, No. of None, are their live parts insulated from the frame or case ✓, are their fittings as per Rule ✓

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 axis 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 ✓

, if not of this type, state distance of the combustible material horizontally or vertically above the motors ✓ and ✓

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

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 Flash point of oil about 150° F.

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.	Rev. per Min.		
MAIN ...	3	50	220	227	325	auxiliary Diesel engines.	
AUXILIARY ...							
EMERGENCY ...							
ROTARY TRANSFORMER	1	15	110	136	1650		

LIGHTING AND HEATING CONDUCTORS.

Ref. No.	DESCRIPTION.	No. of Conductors.	Effective Area of each Conductor. Sq. In.	COMPOSITION OF STRAND.		Total Maximum Current Ampères.	Approximate Length (Lead and Return.) Meters.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
MAIN GENERATOR...									
AUXILIARY GENERATOR									
EMERGENCY GENERATOR									
ROTARY TRANSFORMER	2	95	19.	2.52	136	✓	8	Varnished rubber	Wire armoured.
AUXILIARY SWITCHBOARDS									
ENGINE ROOM	2	6	7	1.05	abt. 15	✓	6	—	—
BOILER ROOM									
Saloon house	2	6	7	1.05	✓ 15	✓	66	—	—
Officers	2	6	7	1.05	✓ 20	✓	44	—	—
Crew space aft	2	4	9	0.85	✓ 6	✓	48	—	—
Navigation lights	2	6	7	1.05	✓ 8	✓	8	—	—
WIRELESS	2	16	7	1.70	abt. 40	✓	86	Varnished rubber	Wire armoured.
SEARCHLIGHT									
MASTHEAD LIGHT	2	1.5	1	1.38	2	✓	120	—	—
SIDE LIGHTS	2	1.5	1	1.38	2	✓	20	—	—
COMPASS LIGHTS	2	1.5	1	1.38	0.3	✓	10	—	—
POOP LIGHTS	2	1.5	1	1.38	1	✓	110	—	—
CARGO LIGHTS									
ARC LAMPS									
HEATERS									

MOTOR CONDUCTORS.

Ref. No.	DESCRIPTION.	No. of Motors.	Effective Area of each Conductor. Sq. In.	COMPOSITION OF STRAND.		Total Maximum Current Ampères.	Approximate Length (Lead and Return.) Meters.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
BALLAST PUMP	1	25	19	7	2.13	abt. 56	44	Varnished rubber	Wire armoured.
MAIN BILGE LINE PUMPS									
GENERAL SERVICE PUMP									
EMERGENCY BILGE PUMP									
SANITARY PUMP <i>Bilge Pump</i>	1	10	7	1.35	abt. 29.5	✓	61	—	—
CIRC. SEA WATER PUMPS <i>Oil Pumps</i>	2	50	19	1.83	✓ 90	✓	20	—	—
CIRC. FRESH WATER PUMPS									
AIR COMPRESSOR	1	2x120	37	2.03	✓ 330	✓	52	—	—
FRESH WATER PUMP	1	2.5	3	1.04	✓ 4	✓	60	—	—
ENGINE TURNING GEAR	2	10	7	1.35	✓ 25	✓	60	—	—
ENGINE REVERSING GEAR									
LUBRICATING OIL PUMPS									
OIL FUEL TRANSFER PUMP	1	4	7	0.85	✓ 16	✓	30	—	—
WINDLASS <i>4 Winches</i>	5	150	39	2.27	✓ 190	✓	168	—	—
WINCHES, FORWARD	2	50	19	1.83	✓ 90	✓	28	—	—
WINCHES, AFT	5	95	19	2.52	✓ 144	✓	110	—	—
STEERING GEAR	1	25	7	2.13	✓ 45	✓	145	—	—
WORKSHOP MOTOR	1	2.5	3	1.04	✓ 8.5	✓	12	—	—
VENTILATING FANS	1	1.5	1	1.38	✓ 4	✓	12	—	—

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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
BURMEISTER & WAINS MASKIN- OG SKIBSBYGGERI Electrical Engineers.

Date

COMPASSES.

Distance between electric generators or motors and standard compass about 56 feet.

Distance between electric generators or motors and steering compass — 45 —

The nearest cables to the compasses are as follows :—

A cable carrying abt. 8 Ampères abt. 10 feet from standard compass abt. 8 feet from steering compass.

A cable carrying 4 0.3 Ampères to pump in feet from standard compass and in 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 all course in the case of the standard compass, and 0 degrees on all course in the case of the steering compass.

AKTIESELSKABET
BURMEISTER & WAINS MASKIN- OG SKIBSBYGGERI

Builder's Signature. Date

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 whole electric lighting and power installation as above described are fitted in accordance with the Rules, the approved plan and the requirements contained in Rardon letter E dated the 1st August 1923.

The material used and the workmanship are of good description in every respect.

The whole installation has been tested under full power working condition and found satisfactory.

Recommend the vessel to have notation of "Electric light" in the Register Book.

It is submitted that
this vessel is eligible for
THE RECORD.

Elec. Light

C.W. 21/12/23

Total Capacity of Generators 150 Kilowatts

The Fee is noted on the Machinery Report.
The amount of Fee £ : : When applied for,
Travelling Expenses (if any) £ : : When received,

A.C. Arbeck. M. Clausen.
Surveyor to Lloyd's Register of Shipping.

FRI. DEC. 21.1923

Committee's Minute

Assigned