Rpt. 13.

No. 22995

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office DEC 17 1938

Date of writing Report 12th December 38. When Handed in at Local Office ..... to Port of HAMBURG

No. in Reg. Book. 76490 Survey held at HAMBURG Date, First Survey 11th October Last Survey 5th Decemb. 1938. (Number of Visits 14)

on the Steel Single Screw Motor Tanker INVERILEN Tons Gross 9456 Net 5561.

Built at HAMBURG By whom built Deutsche Werft A. G. Yard No. 204 When built 1938

Owners Inver Tankers, Ld. Port belonging to Dublin

Electric Light Installation fitted by Allgemeine Elektricitäts Gesellschaft Contract No. When fitted 1938

Is the Vessel fitted for carrying Petroleum in bulk yes

System of Distribution two wire, two conductor system ✓

Pressure of supply for **Lighting** 110 ✓ volts, **Heating** 110 ✓ volts, **Power** 110 ✓ volts.

Direct or Alternating Current, Lighting direct current ✓ **Power** direct current ✓

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 no ✓, 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 – Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing –

Have certificates for generators under 100 kw. been supplied and approved certificates attached.

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 front side of engine room floor ✓, 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 –,

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 front side of engine room floor ✓

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 marble, tested to 2000 volts A.C., 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 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

For each generator a double pole linked switch and a fuse on each pole
For each outgoing circuit a double pole change over 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 2 ✓ ammeters 2 ✓ 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

Voltmeter with Ohm 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

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current protection devices been tested under working conditions – are all fuses labelled as per rule 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* yes ✓ *are the cables insulated and protected as per Tables* IV, ~~V~~, X, XI, ~~XII~~ *or* ~~XIII~~ *of the Rules* generally the German Standards have been applied

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* 4.5 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* –, *or waterproof insulating tape* – **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 laid under machines or floorplates* yes ✓ *if so, are they adequately protected* 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* all lead covered and armoured cables clipped on galvanized sheet iron cable runs and where necessary enclosed in galvanized steel casings or tubing

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* gastight joint 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 and wood ✓

Earthing Connections, *state what earthing connections are fitted and their respective sectional areas* none ✓, *are their connections made as per Rule* –.

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* –

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 in wheel house ✓ *has each navigation lamp an automatic indicator as per Rule* yes ✓. **Secondary Batteries,** *are they constructed and fitted as per Rule* –, *are they ventilated as per Rule* –

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* –, *are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected* gastight fitted strongly protected glass bowles in pumps rooms ✓, *how are the cables led* in gastight galvanized tubes in forepeak pumproom and in the space immediately over the tanks in midships house *where are the controlling switches situated* on bridge deck ✓ *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* –

Searchlight Lamps, No. of – *whether fixed or portable* –, *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 axes of rotation fore and aft* yes except rudder motors ✓, *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* –

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing – *have certificates for all motors for essential services been supplied and approved* please find attached ✓ **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* steel masts **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 flameproof type approved for use in dangerous spaces –

Spare Gear, *if the vessel is for open sea service have spares been supplied as per Rule* yes ✓ *are they suitably stored in dry situations* yes ✓

PARTICULARS OF GENERATING PLANT.

DESCRIPTION OF GENERATOR.	No. of	RATED AT Kilowatts.	Volts.	Amperes.	Revs. per Min.	DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE. Fuel Used.	Flash Point of Fuel.
MAIN ...	1	30	115	260	450	Compound steam eng	–	
~~AUXILIARY~~	1	30	115	260	500	2-cyl. 2SC SA. Oil eng.	diesel oil	above 150°F.
EMERGENCY ...								
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS. No. per Pole.	CONDUCTORS. Total Nominal Area per Pole Sq. Inches	COMPOSITION OF STRAND. No.	COMPOSITION OF STRAND. Diameter.	TOTAL MAXIMUM CURRENT. AMPERES. Circuit.	TOTAL MAXIMUM CURRENT. AMPERES. Rule.	Approximate Length. (Lead and Return.) Feet. metres	Insulated with	HOW PROTECTED.
MAIN GENERATOR No. 1+2	1	240	91	1.84	260	271.8 ✓	14	Rubber	In accomodation spaces lead covered. All the other cables lead covered and armoured.
~~SHORE~~ CONNECTIONS ...	1	50	19	1.83	100	98.3 ✓	36		
AUXILIARY GENERATOR ...									
EMERGENCY GENERATOR ...									
ROTARY TRANSFORMER { MOTOR ... / GENERATOR ...									
ENGINE ROOM ... ... } ... BOILER ROOM ... ... } ...	1	1.5	1	1.38	~6	9.4 ✓	~22		
AUXILIARY SWITCHBOARDS No.2	1	25	19	1.3		63.2 ✓			
" " No.1	1	25	19	1.3	60	63.2 ✓			
Navigation control board	1	2.5	1	1.78		15.5 ✓			
Auxiliary switchboard No.5	1	2.5	1	1.78		15.5 ✓			
" " No.3	1	35	19	1.53	70	77.7 ✓			
" " No.4	1	10	19	0.82	30	38.1 ✓			
~~ACCENTUATOR~~ ... No.6	1	35	19	1.53	51	77.7 ✓			
" " No.7	1	70	37	1.55	117	123.7 ✓			
HEATING PLATE 3 kW	1	10	19	0.82	27	38.1 ✓	50		
" " 1.2 "	1	2.5	1	1.78	11	15.5 ✓	20		
ECHO SOUNDING DEVICE	1	2.5	1	1.78	10	15.5 ✓	212		
WIRELESS	1	10	19	0.82	32	38.1 ✓	184		
SEARCHLIGHT									
MASTHEAD LIGHT FORE & AFT	1	1.5	1	1.38	0.37	9.4 ✓	148 / 180		
SIDE LIGHTS	1	1.5	1	1.38	0.37	9.4 ✓	40		
COMPASS LIGHTS	1	1.5	1	1.38	0.14	9.4 ✓	15		
POOP LIGHTS	1	1.5	1	1.38	0.37	9.4 ✓	250		
CARGO LIGHTS on bell masts	1	2.5	1	1.78	4.6	15.5 ✓	104 / 120		
HEATERS									

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS. No. Per Pole.	CONDUCTORS. Total Nominal Area per Pole Sq. Inches	COMPOSITION OF STRAND. No.	COMPOSITION OF STRAND. Diameter.	TOTAL MAXIMUM CURRENT. AMPERES. In Circuit.	TOTAL MAXIMUM CURRENT. AMPERES. Rule.	Approximate Length. (Lead and Return.) Feet. m.	Insulated with	HOW PROTECTED.
BALLAST PUMP										
MAIN BILGE LINE PUMPS ...										
GENERAL SERVICE PUMP ...										
EMERGENCY BILGE PUMP ...										
SANITARY PUMP	1	1	10	19	0.82	25.6	38.1 ✓	24		
CIRC. SEA WATER PUMPS ...										
~~CIRC.~~ FRESH WATER PUMPS FOR MIDSHIP HOUSE ...	1	1	2.5	1	1.78	6.3	15.5 ✓	29		
~~AIR~~ REFRIGERATING COMPRESSOR	1	1	25	19	1.3	69	63.2 ✓	72		
FRESH WATER PUMP	1	1	10	19	0.82	25.6	38.1 ✓	66		
ENGINE TURNING GEAR	1	1	50	19	1.83	120	114.8 ✓	68		
ENGINE REVERSING GEAR ...										
LUBRICATING OIL PUMPS ...										
OIL FUEL TRANSFER PUMP ...										
WINDLASS										
WINCHES, FORWARD									Rubber	Lead covered and armoured
LA-MONT DONKEY BOILER WATER CIRCULATING PUMP	1	1	10	19	0.82	25.6	38.1 ✓	92		
WINCHES, AFT										
OIL PURIFIER	2	1	10	19	0.82	25.6	38.1 ✓	15 / 16		
STEERING GEAR—										
(a) MOTOR GENERATOR ...	1	1	50	19	1.83	125/79	114.8 ✓	124		
(b) MAIN MOTOR	2	1	50	19	1.83	79	114.8 ✓	20		
WORKSHOP MOTOR										
VENTILATING FANS										
LATHE	1	1	4	19	0.52	17.6	22.1 ✓	30		
GRINDING STONE	1	1	1.5	1	1.38	4.5	9.4 ✓	34		
DRILLING MACHINE	1	1	4	19	0.52	17.6	22.1 ✓	28		
"DEMAG"- HOIST	1	1	35	19	1.53	79	84.7 ✓	22		
2 AIR COMPRESSORS FOR OILFIRED STOVE (1 for spare)	2	1	2.5	1	1.78	16.8	15.5 ✓	50		

The Electrical Equipment is installed in accordance with the approved plans.

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

The foregoing is a correct description.

DEUTSCHE WERFT AKTIENGESELLSCHAFT ABTEILUNG SCHIFFBAU

Electrical Engineers. Date 12.XII.38.

COMPASSES.

Minimum distance between electric ~~generators or~~ motors and standard compass about 18 metres

Minimum distance between electric ~~generators or~~ motors and steering compass about 10 metres

The nearest cables to the compasses are as follows :—

A cable carrying 0.2 Ampères close to ~~feet from~~ standard compass close to ~~feet from~~ steering compass.

A cable carrying ... Ampères ... feet from standard compass ... 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 ...

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 — course in the case of the standard compass, and nil degrees on — course in the case of the steering compass.

DEUTSCHE WERFT AKTIENGESELLSCHAFT

Builder's Signature. Date 12.12.1938.

Is this installation a duplicate of a previous case yes If so, state name of vessel INVERLIFFEY, INVERDARGLE, INVERSUIR.

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

Material and workmanship of this Electrical Installation are of good quality. It has been fitted under Special Survey in accordance with the approved plans, the Secretary's letter and otherwise in compliance with the requirements of the Rules and is eligible in my opinion to be classed. It has given satisfaction under working conditions.

Noted
J.Rm
19.12.38

Total Capacity of Generators 60 ✓ **Kilowatts.**

The amount of Fee ... ... £ R M : 570 :- When applied for, 10. 12. 1938.

Travelling Expenses (if any) £ : : When received. 10. 1. 1939

H. Rahrs

Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUE. 20 DEC 1938

Assigned See Ham. F.E. 22995

20.12.38.—Transfer.

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