Rpt. 13. No. 1421

REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office 10 JAN 1936

Date of writing Report 7th Jan., 1936. When handed in at Local Office 8th Jan., 1936. Port of Malmö

No. in Survey held at Malmö Date, First Survey 6th Nov. 1935 Last Survey 2nd Jan., 1936.
(Number of Visits 17.)

Reg. Book suppl. 39508 on the Single Screw Steel Motor Tanker "ORION" Tons Gross 8064 Net 4751

Built at Malmö By whom built Kockums M.V. A/B. Yard No. 184 When built 1936

Owners Swedish Transatlantic Tankrederi A/S Port belonging to Arendal

Electric Light Installation fitted by Kockums M.V. A/B. Contract No. When fitted 1936.

Is the Vessel fitted for carrying Petroleum in bulk Yes

System of Distribution Two wire system.

Pressure *of supply for* **Lighting** 110 ✓ *volts,* **Heating** 110 ✓ *volts,* **Power** 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 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 ✓ *Are the lubricating arrangements of the generators as per Rule* Yes ✓

Position of Generators One on each side at fore end of the motor space driven by oil engines and one on 2nd deck, port side of motor space, driven by steam engine, *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* At fore end of motor space (centre) ✓ *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* Iron (main) ✓, *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 micanite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework* No conducting parts pass through the slab. Insulators for 5000 V. fitted. *and is the frame effectively earthed* Yes ✓. *Are the fittings as per Rule regarding :— spacing or shielding of live parts* Width of gangway behind switchboard = 900 mm. Yes ✓, *accessibility of all parts* Yes ✓, *absence of fuses on back of board* ✓, *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 circuit breaker with overload & reversed current trips & a single pole equalizer switch. For each outgoing circuit :- A double pole linked switch & a fuse on each pole.

Instruments *on main switchboard* 7 *ammeters* 4 *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* Ohm meters with indicators for both poles, lamps ✓

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 ✓

Cables: *Single, twin, concentric, or multicore* Single *are the cables insulated and protected as per Tables* IV, V, ~~VI to XIII~~ *of the Rules* Yes.

Fall of Pressure, *state maximum between bus bars and any point of the installation under maximum load* less than allowed in Sec. 4, Par. 4.

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* ✓

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* Supported by clips. All cables are lead covered except in cabins, armoured by galv. steel tap. Where necessary protected by steel sheet.

If cables are run in wood casings, are the casings and caps secured by screws ✓, *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* VIII Yes, equivalent

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

Joints in Cables, *state if any, and how made, insulated, and protected* No joints in main or power cables. For branch cables metal joint boxes and watertight glands.

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 armoured

Earthing Connections, *state what earthing connections are fitted and their respective sectional areas* ✓

, 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 *has each navigation lamp an automatic indicator as per Rule* Yes.

Secondary Batteries, *are they constructed and fitted 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 Lamps contained in gastight fittings in gastight tubing, *how are the cables led where are the controlling switches situated* Outside the spaces.

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

Arc Lamps, *other than searchlight lamps, No. of* ✓, *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 axes of rotation fore and aft* Yes, generally *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 and fitted as per Rule* Yes

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

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 Davies hand lamps.

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	2	2-75	110	682	350	Heavy oil engines	Heavy oil	Above 150° F.
AUXILIARY	1	15	110	137	600	Steam engine		
EMERGENCY								
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS. No. per Pole.	Total Effective Area per Pole Sq. ~~mm~~	COMPOSITION OF STRAND. No.	Diameter.	TOTAL MAXIMUM CURRENT. AMPERES. In Circuit.	Abt. Rule.	Approximate Length. (Lead and Return) ~~Feet~~ m.	Insulated with	HOW PROTECTED.
MAIN GENERATOR	3	185	37	2.52	682	700	max. 27	Rubber	Lead covered & armd. with galv. steel tape.
EQUALISER CONNECTIONS	2 -	185	37	2.52	-	-	" 27	"	" " "
AUXILIARY GENERATOR	1	95	19	2.52	137	150	50	"	" " "
EMERGENCY GENERATOR									
ROTARY TRANSFORMER { MOTOR									
ROTARY TRANSFORMER { GENERATOR									
ENGINE ROOM	1	10	7	1.35	30	40	30	"	" " "
BOILER ROOM	1	10	7	1.35	30	40	27	"	" " "
AUXILIARY SWITCHBOARDS									
light distr. board A	1	10	7	1.35	10	40	195	"	" " "
" " " B	1	50	19	1.83	60	100	112	"	" " "
" " " C	1	4	7	0.86	6	20	124	"	" " "
" " " D	1	16	7	1.71	30	50	52	"	" " "
" " " E	1	16	7	1.71	30	50	58	"	" " "
ACCOMMODATION	1	1.5	7	0.52	max. 4	8	max. 40	"	
WIRELESS	1	25	7	2.13	Abt. 20	65	120	"	" " "
SEARCHLIGHT SVEZ	1	70	19	2.51	-	120	195	"	" " "
MASTHEAD LIGHT	1	1.5	7	0.52	0.6	8	max. 130	"	" " "
SIDE LIGHTS	1	1.5	7	0.52	0.6	8	40	"	" " "
COMPASS LIGHTS	1	1.5	7	0.52	-	8	20	"	" " "
POOP LIGHTS	1	1.5	7	0.52	0.6	8	224	"	" " "
CARGO LIGHTS									
ARC LAMPS									
HEATERS	1	70	19	2.51	100	120	74	"	" " "

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS. No. Per Pole.	Total Effective Area per Pole Sq. Ins.	COMPOSITION OF STRAND. No.	Diameter.	TOTAL MAXIMUM CURRENT. AMPERES. In Circuit.	Rule.	Approximate Length. (Lead and Return) Feet.	Insulated with	HOW PROTECTED.
BALLAST PUMP										
MAIN BILGE LINE PUMPS										
GENERAL SERVICE PUMP	1	1	35	7	2.53	64	75	46	Rubber	Lead covered & armd. with galv. steel tape.
EMERGENCY BILGE PUMP	1	1	35	7	2.53	68	75	50	"	" " "
SANITARY PUMP										
CIRC. SEA WATER PUMPS	2	1	150	37	2.3	192	200	45	"	" " "
CIRC. ~~FRESH~~ SEA WATER PUMPS FOR AUX. ENG.	1	1	25	7	2.13	60	65	25	"	" " "
AIR COMPRESSOR										
FRESH WATER PUMP	1	1	2.5	7	0.67	7	15	50	"	" " "
ENGINE TURNING GEAR	1	1	70	19	2.51	112	120	50	"	" " "
ENGINE REVERSING GEAR										
LUBRICATING OIL PUMPS	2	1	185	37	2.52	224	240	max. 51	"	" " "
OIL FUEL TRANSFER PUMP	1	1	16	7	1.71	40	50	50	"	" " "
WINDLASS										
WINCHES, FORWARD										
WINCHES, AFT										
STEERING GEAR—										
(a) MOTOR GENERATOR										
(b) MAIN MOTOR	1	1	70	19	2.51	max. 110	120	120	"	" " "
WORKSHOP MOTOR	1	1	6	7	1.05	24	30	44	"	" " "
VENTILATING FANS										
CO_2 compressor	1	1	35	7	2.53	68	75	73	"	" " "
Lubr. oil separator	1	1	2.5	7	0.67	15	75	44	"	" " "
" " heater		1	95	19	2.52	137	150	69	"	" " "
Fuel oil separator	1	1	2.5	7	0.67	15	15	52	"	" " "
" " heater		1	150	37	2.3	191	200	50	"	" " "

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.

Reiss Brainerd Electrical Engineers. Date 7-1-1936.

COMPASSES.

Distance between electric generators or motors and standard compass From engine room to bridge

Distance between electric generators or motors and steering compass

The nearest cables to the compasses are as follows :—

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

The maximum deviation due to electric currents was found to be ..... *degrees on* ..... *course in the case of the standard compass, and* ..... *degrees on* ..... *course in the case of the steering compass.*

KOCKUMS MEKANISKA VERKSTADS AKTIE-BOLAG

T. L. Mossum *Builder's Signature.* Date 7-1-1936.

E.H.-T.

Is this installation a duplicate of a previous case Yes *If so, state name of vessel* M/T "Fagerfjell"

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

The above described electric installation has been installed under my inspection and has been tested and found satisfactory.
The materials and the workmanship are both good.
All the Rule requirements have been complied with.

Ahlid
L.J.
14/1/36.

Total Capacity of Generators 165 *Kilowatts.*

The amount of Fee ..... £Kr. 632.45 — When applied for, 8th Jan, 1936.

Travelling Expenses (if any) £ : : — When received. 17.1.1936

Aslundein
Surveyor to Lloyd's Register of Shipping.

Committee's Minute FRI. 17 JAN 1936

Assigned See the F.E. Rpt

2m.3.31.—Transfer.

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