

# REPORT ON ELECTRIC FITTINGS.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office 19 SEP 1930

Date of writing Report 25th Aug. 1930 When handed in at Local Office 26th Aug. 1930 Port of NAGASAKI.

No. in Survey held at NAGASAKI. Date, First Survey 24th May 30. Last Survey 15th August 1930.  
Reg. Book. (Number of Visits 9.)

86658 on the Steel Twin Screw Motor Ship "TOKAI MARU".  
Tons { Gross 8365.28  
Net 5046.44  
Built at Nagasaki. By whom built Mitsubishi Zosen Kaisha. Yard No. 472 When built 1930

Owners Osaka Shosen Kabushiki Kaisha. Port belonging to Osaka.

Electric Light Installation fitted by Mitsubishi Zosen Kaisha, Ltd., Contract No. When fitted 1930.

System of Distribution Two wire system. /  
Pressure of supply for Lighting 225 volts, Heating / volts, Power 225 volts.  
Direct or Alternating Current. Lighting Direct 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 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 In Machinery Space.

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 of

Main Switch Boards, where placed At forward end/Machinery Space.

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

if semi-insulating material is used, are all conducting parts insulated from the slab with mica or micaite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework "Ebony sindanyo" insulating material is used.

and is the frame effectively earthed / 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, 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. A double pole circuit breaker with overload trip, time lag device, reverse current trip and single pole equalizer switch interlocked with the circuit breaker as per rule, and double pole knife switch for each generator. A double pole overload circuit breaker with time lag device or a double pole knife switch with enclosed fuse on each pole for each out-going circuit.

Instruments on main switchboard 7 ammeters 2 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 Lamp.

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

Steel Twin Screw Motor Ship "T O K A I M A R U".

Ref. No.	Description.	No. of Cond.	Effective area of each con. sq. in.	Composition of strand No. Dia.	Total Maximum current amperes	Approximate length (L & R ft)	Insulated with	How Protected.
1	No. 3 Main Dynamo.	4	1.07885	127 .104	1155	186	Rubber	Lead covered & armoured.
2	Equalizer for above	1	"	"	"	"	"	"
3	No. 2 Fuse board	6	.6062	91 .093	1050	274	"	"
4	No. 1 Fuse board	4	"	"	640	148	"	Lead covered & braided.
5	Windlass motor	2	.4064	61 "	220	176	"	"
6	No. 1, 5 ton winch motor	2	"	"	222	80	"	"
7	No. 11, 3 ton winch motor	2	.1168	37 .064	120	234	"	"
8	No. 3 Fuse board	6	.4064	61 .093	857	264	"	"
9	No. 4 Fuse board	4	"	"	513	142	"	"
10	No. 12, 3 ton winch motor	2	.1168	37 .064	120	86	"	"
11	No. 19, 5 ton "	2	.4064	61 .093	222	76	"	"
12	Aux. switchboard for Ref. Mach.	2	.6062	91 "	287	164	"	"
13	No. 2 Ref. comp. motor.	2	.1168	37 .064	123	72	"	L.C.A.
14	No. 2 Brine pump motor	2	.00701	7 .036	11.5	164	"	"
15	No. 1 Cooling pump motor	2	"	"	9	126	"	"
16	Steering motor starter	2	.1964	37 .083	114	78	"	"
17	Steering motor	4	.0600	19 .064	11	700	"	"
18	Junct. box for cooking fan motor	2	.00701	7 .036	9	204	"	"
19	No. 2 Cooking fan motor	2	"	"	4.5	60	"	"
20	Wireless switchboard	2	"	"	17	292	"	"
21	Sec. battery for wireless tel.	2	"	"	19	110	"	"
22	Motor side for 2 K.V.A. Mot-Gen.	2	"	"	17	124	"	"
23	Gen. side for "	2	"	"	10	"	"	"
24	Motor side for 1/2 K.V.A. Mot-Gen.	2	"	"	19	"	"	"
25	Gen. side for "	2	"	"	2.5	"	"	"
26	Gyro-compass control panel	2	"	"	4.8	146	"	"
27	Battery for Gyro-compass	2	"	"	6	18	"	"
28	Motor side for Mot-Gen.	4	.00322	1 .064	4.8	14	"	L.C.
29	A.G. Gen. side for "	7	"	"	3	"	"	"
30	D.C. " " " " }	1	"	"	6	"	"	"
31	No. 1 Turbu blower motor	8	.6062	91 .092	1330	139	"	L.C.A.
32	No. 2 Aux. air comp. motor	4	"	"	740	228	"	"
33	No. 1 Jacket & piston C.P. Motor.	2	"	"	285	148	"	"
34	No. 2 Lub. oil pump motor	2	.1964	37 .083	148	100	"	"
35	No. 1 Engine turning motor	2	.02214	7 .064	42	285	"	"
36	Bilge & ballast pump motor	2	.1964	37 .083	128	176	"	"
37	G.S. & fire pump motor	2	"	"	"	186	"	"
38	Bilge & sanitary pump motor	2	.01267	7 .048	24	153	"	"
39	No. 2 Fuel oil shifting P. Motor.	2	.1168	37 .064	94	137	"	"
40	No. 1 Fuel oil service P. Motor.	2	.00706	7 .036	7.4	160	"	"
41	Lub. oil service pump motor	2	"	"	"	206	"	"
42	Work shop motor	2	"	"	"	229	"	"
43	Junct. box for fuel oil purifier	2	.02214	" .064	36	170	"	"
44	No. 1 Fuel oil purifier motor	2	.00701	" .036	12	39	"	"
45	Junct. box for Lub. oil purifier	2	.01267	" .048	24	192	"	"
46	No. 1 Lub. oil purifier motor	2	.00701	" .036	12	44	"	"
47	Junct. box for Eng. Rm. Vent Fan M.	2	.03458	19 .048	62	56	"	"
48	No. 2 Eng. Rm. Vent Fan Motor	2	.01267	7 "	31	430	"	"
49	No. 1 Submain board	2	"	"	24.91	180	"	"
50	No. 1 Dist. board	2	.00322	1 .064	4.46	112	"	"
51	No. 2 "	2	"	"	7.45	64	"	"
52	No. 3 "	2	"	"	7	4	"	"
53	No. 4 "	2	"	"	3.09	4	"	"
54	No. 5 "	2	"	"	2.91	4	"	"
55	No. 2 Submain board	2	.00701	7 .036	15.11	180	"	"
56	No. 6 Dist. board	2	.00322	1 .064	8.64	64	"	"
57	No. 7 "	2	"	"	6.47	4	"	"
58	No. 8 Submain board	2	.00701	7 .036	18.92	62	"	"
59	No. 8 Dist. board	2	.00322	1 .064	4.45	4	"	"
60	No. 9 "	2	"	"	7.1	4	"	"
61	No. 10 "	2	"	"	6	4	"	"
62	Socket for 300 W. lamp	2	"	"	1.37	236	"	"
63	Flex. cord for 300 W lamp	2	"	"	1.37	30	"	Hemp braided flex cord.
64	Bus-bar lamp	2	.00475	168 .006	1.09	62	"	L.C.A.
65	No. 4 Submain board	2	.00181	1 .048	16.09	274	"	L.C.A.B.
66	Socket for cargo cluster (No. 1 H)	2	.00181	1 .048	2.18	140	"	"
67	Flex. cord. " " "	2	.00475	168 .006	1.09	80	"	H.B.F.C.
68	Socket for " " (fore mast)	2	.00181	1 .048	4.09	140	"	L.C.A.B.
69	Flex. cord " " "	2	.00475	168 .006	1.36	80	"	L.C.A.B.
70	Fore mast cargo lamp (fixed)	2	.00181	1 .048	11	90	"	H.B.F.C.
71	Socket for cargo lamp (fore twin mast)	2	"	"	5.46	4	"	L.C.A.B.
72	Flex cord " " "	2	.00475	168 .006	1.36	80	"	H.B.F.C.
73	Fore twin mast cargo lamp (fixed)	2	.00181	1 .048	1.36	100	"	L.C.A.B.
74	No. 5 Submain board	2	.00701	7 .036	16.09	300	"	"
75	Socket for cargo cluster (No. 6 H)	2	.00181	1 .048	2.18	120	"	"
76	Flex cord " " "	2	.00475	168 .006	1.09	80	"	H.B.F.C.
77	Socket for cargo lamp (aft twin mast)	2	.00181	1 .048	5.46	4	"	L.C.A.B.
78	Flex cord " " "	2	.00475	168 .006	1.36	80	"	H.B.F.C.
79	Aft twin mast cargo lamp (fixed)	2	.00181	1 .048	1.36	100	"	L.C.A.B.
80	Socket for cargo lamp (M. mast)	2	.00181	1 .048	4.09	120	"	"
81	Flex cord " " "	2	.00475	168 .006	1.36	80	"	H.B.F.C.
82	Main mast cargo lamp (fixed)	2	.00181	1 .048	1.36	90	"	L.C.A.B.
83	Nav. lamp (signal light indicator)	2	.00701	7 .036	1.46	298	"	L.C.A.
84	Fore mast lamp	4	.00181	1 .048	.272	708	"	L.C.A.B.
85	Main mast lamp	4	"	"	"	730	"	"
86	Socket for Star. side lamp	4	"	"	"	86	"	"
87	Flex cord " " "	4	.00189	67 .006	"	4	"	"
88	Socket for Port side lamp	4	.00181	1 .048	"	62	"	L.C.A.
89	Flex cord " " "	4	.00189	67 .006	"	4	"	H.B.F.C.
90	Stern lamp	4	.00181	1 .048	"	756	"	L.C.A.B.
91	No. 11 Dist. board (cabin fan)	2	.00322	1 .064	6.82	218	"	L.C.A.
92	Charging board for battery lamp	2	.00181	1 .048	4	10	"	"

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

**Fall of Pressure,** state maximum between bus bars and any point of the installation under maximum load **9.8 volts for Power. 8.6 volts for Lighting.**

**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 **Clamped to metal bracket or perforated and galvanized steel plate by metal clip and protected by steel armoring, steel pipe or steel plate where necessary.**

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**

**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 **In Junction box as per Rule.**

**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 **Earthing connection for wireless telegraph only - sectional area 0.00715 sq. in.**

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 /

**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 **Lamps in store and Cargo space (silk room) are protected by strong metal guard.**

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

how are the cables led /

where are the controlling switches situated /

**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** 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 **Totally enclosed** 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. /

If portable lamps for use in dangerous spaces are supplied, are they of a type approved by the Home Office /

**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 ...	<b>3</b>	<b>260</b>	<b>225</b>	<b>1155</b>	<b>340</b>	<b>Diesel engine.</b>	<b>Diesel.oil</b>	<b>Above 150°</b>
AUXILIARY ...								
EMERGENCY ...								
ROTARY TRANSFORMER								

**LIGHTING AND HEATING CONDUCTORS.**

Ref. No.	DESCRIPTION.	No. of Conductors.	Effective Area of each Conductor. Sq. Ins.	COMPOSITION OF STRAND.		Total Maximum Current. Ampères.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
	MAIN GENERATOR...								
	EQUALISER CONNECTIONS								
	AUXILIARY GENERATOR								
	EMERGENCY GENERATOR								
	ROTARY TRANSFORMER...								
	AUXILIARY SWITCHBOARDS								
	ENGINE ROOM								
	BOILER ROOM								
	ACCOMODATION								
	WIRELESS								
	SEARCHLIGHT								
	MASTHEAD LIGHT...								
	SIDE LIGHTS								
	COMPASS LIGHTS								
	POOP LIGHTS								
	CARGO LIGHTS								
	ARC LAMPS								
	HEATERS								

**MOTOR CONDUCTORS.**

Ref. No.	DESCRIPTION.	No. of Motors.	Effective Area of each Conductor. Sq. Ins.	COMPOSITION OF STRAND.		Total Maximum Current. Ampères.	Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
				No.	Diameter.				
	BALLAST PUMP								
	MAIN BILGE LINE PUMPS								
	GENERAL SERVICE PUMP								
	EMERGENCY BILGE PUMP								
	SANITARY PUMP								
	CIRC. SEA WATER PUMPS								
	CIRC. FRESH WATER PUMPS								
	AIR COMPRESSOR								
	FRESH WATER PUMP								
	ENGINE TURNING GEAR								
	ENGINE REVERSING GEAR								
	LUBRICATING OIL PUMPS								
	OIL FUEL TRANSFER PUMP								
	WINDLASS								
	WINCHES, FORWARD								
	WINCHES, AFT								
	STEERING GEAR—								
	(a) MOTOR GENERATOR...								
	(b) MAIN MOTOR								
	WORKSHOP MOTOR								
	VENTILATING FANS								

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.

NAGASAKI WORKS, MITSUBISHI ZOSSEN KAISHA, LTD.

*S. Motora*  
 GENERAL MANAGER.

Electrical Engineers.

Date AUG 27 1930

**COMPASSES.**

Distance between electric generators or motors and standard compass 15 feet from Gyro pilot motor.

Distance between electric generators or motors and steering compass 2 feet 3 inches from Gyro pilot motor.

The nearest cables to the compasses are as follows:—

A cable carrying 0.1 Ampères 1 feet from standard compass 1 feet from steering compass.

A cable carrying 3 Ampères 15 feet from standard compass 2.2 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 No degrees on Any and every course in the case of the standard

compass, and About 10 degrees on Easterly or Westerly course in the case of the steering compass. due to gyro pilot motor.

NAGASAKI WORKS, MITSUBISHI ZOSSEN KAISHA, LTD.

*S. Motora*  
 GENERAL MANAGER.

Builder's Signature.

Date AUG 27 1930

Is this installation a duplicate of a previous case Yes If so, state name of vessel "Kinai Maru" Nag.Rpt No.1737.

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

The materials and workmanship are good, and the installation has been fitted in accordance with the Rules, tested under working condition and found satisfactory.

Plans sent under separate cover of:- Wiring diagram (2 sheets).

*It is submitted that this record is eligible for THE RECORD Elec. Light.*

*[Signature]*  
28/9/30

Total Capacity of Generators 780 Kilowatts.

The amount of Fee ... ¥ 510:00 : 13. 8. 30

Travelling Expenses (if any) £ : : 25. 8. 30

*George Anderson*  
 Surveyor to Lloyd's Register of Shipping

Committee's Minute FRI. 26 SEP 1930

Assessed Elec Light

Im. 228. Transfer. (The surveyors are requested not to write on or below the space for Committee's Minute.)



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