

REPORT ON ELECTRICAL EQUIPMENT.

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

Date of writing Report 19 Jan 1938 When handed in at Local Office 21 Jan 1938 Port of New York
 No. in Survey held at New York Date, First Survey 31 Dec 1937 Last Survey 14 Jan 1938
 Reg. Book. 5/5 Esso Houston (Number of Visits.....)
 on the Esso Houston Tons { Gross 7699
 Net 4654
 Built at Kearny R. J. By whom built Federal S. B. & D. D. Co. Yard No. 145 When built 1938
 Owners Standard Oil Co. of New Jersey Port belonging to Wilmington Del.
 Electric Light Installation fitted by Federal S. B. & D. D. Co. Contract No. 145 When fitted 1938
 Is the Vessel fitted for carrying Petroleum in bulk Yes.

System of Distribution

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

Direct or Alternating Current, Lighting

D.C.

Power D.C.

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. Flat compounded ✓, 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 By American Bureau of Shipping

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 Eng. Room Tween Decks. Starboard Side ✓, 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 near combustible material ✓

are the generators protected from mechanical injury and damage from water, steam or oil Yes ✓, are their axes of rotation fore and aft Yes ✓

Earthings, 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 Eng. Room Tween Decks. Starboard Side ✓

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 not near combustible material ✓

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 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 ✓, 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 ✓, 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 1 Circuit Breaker for each Generator, 1 Double Pole Switch for each outgoing circuit. Equalizer switches combined with Main Switches ✓

Are turbine driven generators fitted with emergency trip switch as per rule No. Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material Yes ✓

Instruments on main switchboard 3 ✓ ammeters 3 ✓

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

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system YES ✓

Switches, Circuit Breakers and Fusible Cut-outs, Ground Lamps, Also Indicating Voltmeter ✓

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 + twin* 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 *less than 5%* 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 *Leaded + Armored throughout*
Supporting clips less than 2' apart

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 armored 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 *yes*

Earthing Connections, state what earthing connections are fitted and their respective sectional areas *none*

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 *none*

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 *none*

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 *yes*

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 *none*, are air heaters constructed and fitted as per Rule *none*

Searchlight Lamps, No. of *1*, whether fixed or portable *fixed*, are their fittings as per Rule *yes*

Arc Lamps, other than searchlight lamps, No. of *none*, 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 *not near combustible material* 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 *not reqd* 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 *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.	Amperes.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.	
MAIN	2	300	230	1260	1200	GEARED STEAM TURBINES			
AUXILIARY	1	125	"	560	600/900	MAIN REDUCTION GEARS			
EMERGENCY	NONE								
BALANCERS	2		230/115	40					
ROTARY TRANSFORMER	2	1.5	115	14					

GENERATOR, LIGHTING AND HEATING CONDUCTORS.										
DESCRIPTION.	No. per Pole.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT. AMPERES.		Approximate Length. (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
		Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	Circuit.	Rule.				
MAIN GENERATOR	3	1.649	61	.1071	1250		60	VARNISHED CAMBRIC	LEADED + ARMORED	
EQUALISER CONNECTIONS	2	1.099	"	"				"	THROUGHOUT.	
AUXILIARY GENERATOR	1	.621	"	.1105	560	560	130	"		
EMERGENCY GENERATOR										
BALANCERS	1	.0259	7	.0687	40	68	80	V.C.		
ROTARY TRANSFORMER										
ENGINE ROOM	1	.0521	7	.0973	60	94	140	V.C.		
BOILER ROOM	1	.0327	"	.0792	50	78	180	"		
AUXILIARY SWITCHBOARDS										
MIDSHIP QUARTERS	1	.2589	37	.0973	120	214	240	V.C.		
AFT	1	.0687	7	.1093	66	83	140	RUBBER		
"	1	"	"	"	"	"	"	"		
MACHINE SHOP	1	.0081	"	.0385	16	25	160	V.C.		
ACCOMMODATION										
MIDSHIP QUARTERS	1	.0032	7	.0242	60	129		RUBBER		
AFT	1	"	"	"	"	"	"	"		
"	1	"	"	"	"	"	"	"		
MACHINE SHOP	1	.0051	7	.0305	20	20	550	RUBBER		
WIRELESS	1	.0032	"	.0242	9	129	60	"		
SEARCHLIGHT	1	"	"	"	1	"	200	"		
MASTHEAD LIGHT	1	"	"	"	"	"	80	"		
SIDE LIGHTS	1	"	"	"	"	"	30	"		
COMPASS LIGHTS	1	"	"	"	"	"	"	"		
POOP LIGHTS	1	.0081	7	.0385	8	24	160	RUBBER		
CARGO LIGHTS		NONE								
ARC LAMPS		NONE								
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. Ins.	No.	Diameter.	In Circuit.	Rule.			
FIRE										
BALAST PUMP	1	1	.1962	19	.1147	244	266	160	V.C.	Leaded + Armored
CONDENSATE PUMP	1	1	.0051	7	.0305	10	164	170	"	throughout
MAIN BRIDGE PUMP	1	1	.0032	7	.0282	6	116	110	"	
AUX CONDENSATE PUMP	1	1	"	"	"	"	"	170	"	
GENERAL SERVICE PUMP	1	1	"	"	"	"	"	120	"	
LUB OIL PURIFIER	1	1	"	"	"	"	"	100	"	
EMERGENCY DRAIN PUMP	1	1	"	"	"	"	"	200	"	
SANITARY PUMP	1	1	"	"	"	"	"	220	"	
MAIN CIRC. SEA WATER PUMPS	1	1	.0529	"	.1228	130	140	110	"	
AUX CIRC. FRESH WATER PUMPS	1	1	.0327	"	.0772	49	94	110	"	
AIR COMPRESSOR	1	1	.0051	"	.0305	10	16	200	"	
WASH FRESH WATER PUMP	1	1	.0032	"	.0242	2	116	220	"	
ENGINE TURNING GEAR	1	1	.0081	"	.0385	16	25	"	"	
DRINK WATER PUMP	1	1	.0032	"	.0242	2	116	170	"	
ENGINE REVERSING GEAR	1	1	.0129	"	.0485	28	51	210	"	
LUBRICATING OIL PUMPS	1	1	.0051	"	.0305	10	16	110	"	
OIL FUEL TRANSFER PUMP										
WINDLASS			STEAM							
WINCHES, FORWARD			STEAM							
WINCHES, AFT			STEAM							
STEERING GEAR—										
(a) MOTOR GENERATOR	2	1	.02327	7	.0792	49	94	220	RUBBER	L + A THROUGHOUT
(b) MAIN MOTOR	3	1	.0032	"	.0242	6	116	160	V.C.	
WORKSHOP MOTOR	2	1	"	"	"	4	"	230	RUBBER	
VENTILATING FANS	2	1	"	"	"	"	"	140	V.C.	
FORCED DRAUGHT BLOWERS	1	1	.0327	"	.0772	49	94	150	"	
PUMP ROOM VENT. FAN	1	1	.0032	"	.0242	3	116	170	"	
ICE MACHINE	1	1	.0129	"	.0485	18	51	150	"	
CARGO PUMPS	2	2	.2589	37	.1162	810	834	"	"	
STRIP PUMP	1	1	.2589	"	.0973	324	324	"	"	
BOOSTER DRAIN PUMP	1	1	.0327	7	.0772	50	94	230	"	

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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.

J.H. Blarne
Federal Shipbuilding & Dry Dock Co.

Electrical Engineers.

Date Jan. 20, 1938

COMPASSES.

Distance between electric generators or motors and standard compass

AST 350'

Distance between electric generators or motors and steering compass

The nearest cables to the compasses are as follows:—

Binnacle Lights 1/4 Ampères close 5 feet from standard compass close 5 feet from steering compass.

Navigation Lights 5 Ampères AST 10 feet from standard compass AST 10 feet from steering compass.

RADIO 20 Ampères AST 20 feet from standard compass AST 20 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 NOT STATED degrees on course in the case of the standard compass, and degrees on course in the case of the steering compass.

J.H. Blarne
Federal Shipbuilding & Dry Dock Co. Builder's Signature.

Date Jan 20, 1938

Is this installation a duplicate of a previous case YES If so, state name of vessel ESSO BAYWAY N.Y. Reg No 38079

General Remarks (State quality of workmanship, opinions as to class, etc.)

The Electrical Installation of this vessel has not been built under Special Survey but it has been examined & found to comply with the Rules & the workmanship & material are good.

It has been satisfactorily tried at full load, & it is now in good & safe working condition

Condition

For further remarks, please see attached sheet

Noted.

J.H. Blarne
16-2-38.

Total Capacity of Generators 725 Kilowatts.

The amount of Fee ... £ INCLUSIVE FEE : When applied for, 19
Travelling Expenses (if any) £ : When received, 19

John S. Heck
Surveyor to Lloyd's Register of Shipping.

Committee's Minute NEW YORK FEB 2 - 1938

Assigned Elec. light

Rpt. 9a.

Port of NEW YORK

Continuation of Report No. 3817 dated 19th Jan. 1938 on the

S.S. "ESSO HOUSTON"

ELECTRICAL INSTALLATION

This Electrical Installation was not built under Special Survey but it has been examined and as far as can be seen the workmanship and material are good.

There are two 300 K.W. generators driven by Auxiliary Steam Turbines and one 125 K.W. generator driven by the Main Reduction Gears of the Main Turbines. At sea the 125 K.W. generator takes the load, and one of the 300 K.W. machines idles at speed but without load. When the propeller revolutions fall to 60 R.P.M., the 300 K.W. generator takes up the load, and the 125 K.W. generator is cut out through automatic switches.

The generators are ordinary 2 wire generators and provide 220 volts for the Power Circuits. The 110 volt lighting circuits are provided by means of balancer sets and the bus bar system is therefore 3 wire on the switchboard. From out of the switchboard throughout the vessel the system of Lighting is the ordinary 2 wire system.

Special precautions have been taken on this ship. No wiring and no lamps are fitted in dangerous spaces. Pump room lights are placed entirely outside bulkheads and shine through bulls eyes in bulkheads. Cargo pump motors are placed outside pump room and drive their pumps by shafts passing through stuffing boxes in the bulkheads. Accommodation and furniture are built entirely of steel panels filled with insulating material and reported fireproof.

In view of the above special precautions it is respectfully submitted that the arrangement adopted for the lighting system can be accepted by the Committee.

John S. Heck

Surveyor to Lloyd's Register of Shipping.