

# REPORT OF SURVEY FOR REPAIRS, &c., OF ENGINES AND BOILERS

(Received at London Office \_\_\_\_\_)

Date of writing Report 12. 8. 1947 When handed in at Local Office \_\_\_\_\_ 19\_\_\_\_ Port of LIVERPOOL

No. in Survey held at Birkenhead Date. First Survey 29th April Last Survey 10th July 19\_\_\_\_  
Reg. Book. \_\_\_\_\_ (No. of Visits 25)

86593 on the Machinery of the ESSEX Steel "ESSO BIRMINGHAM"

Tonnage { Gross 10730 Vessel built at Chester, Pa. By whom Sun.S.B. & Dry Dock Co. When 1943  
 Net 7419 Engines made at Lynn, Mass. By whom Gen.Elec. Co., When 1943  
 Nominal \_\_\_\_\_ Boilers, when made (Main) \_\_\_\_\_ (Donkey) \_\_\_\_\_  
 No. of Main Boilers \_\_\_\_\_ Owners Anglo-American Oil Co. Ltd., Owners' Address \_\_\_\_\_  
 No. of Donkey Boilers \_\_\_\_\_ Managers Esso Transportation Co. Ltd., (if not already recorded in Appendix to Register Book.)  
 Steam Pressure \_\_\_\_\_ in Main Boilers \_\_\_\_\_ Port London. Voyage \_\_\_\_\_  
 in Donkey Boilers \_\_\_\_\_ Surveyed Afloat in Dry Dock Birson & Cunnell Ltd Particulars of Classification (which must be inserted  
 (State name of Dock.) \_\_\_\_\_ precisely as in Register Book & Supplement.)

Last Report No. \_\_\_\_\_ Port \_\_\_\_\_

Particulars of Examination and Repairs (if any) Dr. T.S. Machinery Damage  
 Periodical Surveys, when held, must be reported in detail and serially in the terms of the Rules. State clearly the cause of Repairs, if any, and, in detail, the nature and extent of Examinations and subsequent Repairs. Repairs on account of Damage (the cause of which must be stated) should be separated from Repairs due to other causes; and besides being detailed in the body of the report, should be briefly summarised at the end of the report. State also the dates and initials of any letters respecting this case.

In damage cases where the Surveyor has not made a special damage report he is required to state whether he offered his services for this purpose, and why they were declined Offered but not required  
 Was a damage report made by anyone else? If so, by whom? yes J.R. Little Ltd.

Did the Surveyor personally go inside each Main Boiler separately and make a thorough examination at this time? yes  
 " " Donkey " " " none

If not, state for what reasons \_\_\_\_\_ What parts of the Boilers could not be thus thoroughly examined? \_\_\_\_\_

What special means, in the absence of internal examination, were adopted by the Surveyor to assure himself of the thorough efficiency of those parts of each Boiler? \_\_\_\_\_  
 State latest date of internal examination of each boiler 26. 6. 47. Present condition of funnel(s) Efficient

Did the Surveyor examine the Safety Valves of the Main Boilers? yes To what pressure were they afterwards adjusted under steam? 500lbs  
 Did the Surveyor examine the Safety Valves of the Donkey Boilers? yes To what pressure were they afterwards adjusted under steam? superheat valves

Did the Surveyor examine all the manholes, doors and their fastenings of the Main Boilers? yes and of the Donkey Boilers? yes  
 Did the Surveyor examine the drain plugs of the Main Boilers? none and of the Donkey Boilers? yes

Did the Surveyor examine all the mountings of the Main Boilers? yes and of the Donkey Boilers? yes  
 Has the screw shaft now been drawn and examined? yes Has it a continuous liner? yes Is an approved oil retaining appliance fitted at the after end? no

Has shaft now been changed? no If so, state reasons \_\_\_\_\_ Has the shaft now fitted been previously used? yes Has it a continuous liner? yes  
 Is an approved oil retaining appliance fitted at the after end? yes State date of examination of Screw Shaft 23. 6. 47. State the wear down in the stern bush close fit Is electric light and/or power fitted? yes If so, did the Surveyor examine the generators, motors, switchgear, cables and fuses? yes

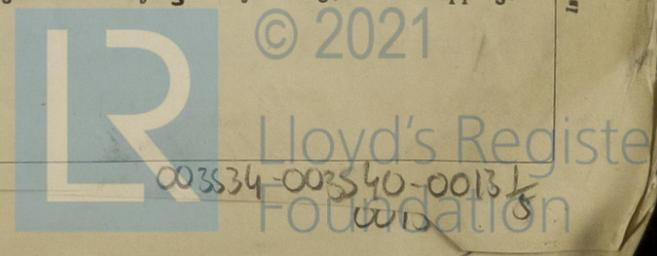
Has the insulation resistance of the generators, circuits and apparatus been tested and found to be not less than 100,000 ohms? yes  
 If the Survey is not complete, state what arrangements have been made for its completion and what remains to be done. No complete machinery

Survey all machinery requires to be examined except the following,  
**NOW DONE :-**  
Docking & T.S. Vessel placed in drydock. Examined propeller, stem bush, screw-thrust and intermediate shafts with their bearings, cocks, valves and outside fastenings of sea connections. The screw shaft liner was found somewhat worn in way of the packing but is considered efficient, it was stated that a new liner would be ordered for fitting at the first opportunity. Ship side blowdown valves are fitted, new cocks have been ordered and will be fitted at the first opportunity.  
Machinery. Examined main turbine rotor, casing, blading and bearings, water end of forward turbo-feed pump, pumping arrangements. Condenser tested.

General Observations, Opinion, and Recommendation:— The machinery of this vessel,  
 (State clearly what alteration, if any, is suggested to be made in the existing classification of the vessel's machinery in the Register Book consequent upon this survey, and also any alteration required to be made in the records of the vessel's machinery, boilers, working pressures, &c.; thus, for example, BS 9,11, B&MS 9,11 \*LMC 9,11 or \*LMC 140 lb., FD, &c.)  
when now seen is eligible in our opinion to be classed and to have record of BS 4,47 and TS. Ch. 6,47 now and MS (with date) on completion of the survey.

Survey Fee (per Section 29) BS & Class 22 0 0 Fees applied for 22 AUG 1946  
 Special Damage or Repair Fee (if any) Last M.S. 110 0 0 Received by me, \_\_\_\_\_  
 (per Section 29.) 66 3 0 \_\_\_\_\_  
 Selling expenses (if chargeable) \_\_\_\_\_  
 LICENCE CASE 6 6 0 \_\_\_\_\_  
 Committee's Minutes LIVERPOOL 26 AUG 1946  
 Signed As now \_\_\_\_\_  
B.S. 4.47. T.S. 6.47

W. Stenhouse & Co.  
 Engineer Surveyors to Lloyd's Register of Shipping.



Insert Character of Ship and Machinery precisely as in the Register Book.

Is a Certificate required? If so, to be sent to \_\_\_\_\_

SS. "Esso BIRMINGHAM"

Machinery. It was stated that there was excessive vibration in the main turbine when running at 3,400 rpm, under load, and that the centre bearing temperature was high.

Main turbine opened up, rotor-casing-blading and bearings, including alternator bearing examined; the labyrinth packing between the 5<sup>th</sup> and 6<sup>th</sup> stages and on each side was bearing heavily over a part of the circumference, indicating whipping. The metal in the centre (10") bearing was hammered and both end (5") bearings wiped.

It was recommended that the rotor be removed ashore and dynamically balanced and the three bearings reinstalled. Whilst removing the rotor from the engine room the sling parted and the rotor dropped into the engine room from a height of about 36ft.

Damage.

How done an account of damage caused by the main turbine rotor falling out of the sling whilst the vessel was under repair at Bidston dock, Birkenhead, on the 6<sup>th</sup> May 1947;

the rotor and lower casing were considerably damaged, the <sup>emergency</sup> diesel alternator, 93.8 KVA, frame broken and control panel damaged, auxiliary turbo alternator cooling water pipelines broken.

Damage Repairs.

Main turbine removed ashore, crated and despatched to the United States for repair

Reconditioned main turbine fitted marked as follows;

G.E.C.

No. 42180 Form W. 4925/5000 KW.

3600/3415 rpm. 435 lbs/sq. in. 420 F.

1.5 lbs. abs 10 stages

\* 14.4 L.O. 5:14:45 (10.5.45)

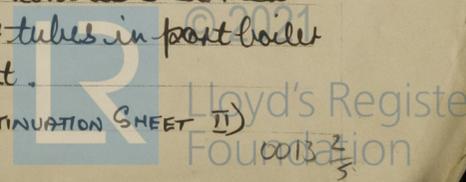
Emergency diesel alternator frame renewed.

Auxiliary turbo alternator cooling water pipelines renewed.

Main and auxiliary machinery examined under full speed conditions at sea, and found satisfactory.

Boiler Survey. Both Babcock & Wilcox water tube boilers examined internally and externally with mountings, manholes, doors and their fastenings; safety valves adjusted under steam. Oil fuel burning installation examined under working conditions and found satisfactory. Fire fighting equipment checked and control rods verified. Satisfactory accumulation tests carried out on both boilers. Majority of generator tubes in port boiler somewhat distorted but considered efficient.

(see CONTINUATION SHEET II)



noted  
Classification Survey party held  
13/9/47  
Bell

(II)

## S.S. "ESBO BIRMINGHAM"

Electrical EquipmentDone for Damage.

Damaged Emergency Oil-engine driven 93.8 K.V.A. alternator removed from vessel and a new stator frame manufactured & fitted to existing windings. Windings examined & tested.

Damaged control panel removed & removed; new metal case fitted. Machine and control panel tested on completion of repairs & found satisfactory.

Main propulsion alternator opened up, examined & found in good condition.

General Examination.

The whole of the propulsion electrical equipment including main & auxiliary alternators, exciters, propulsion motor, auxiliary motor, control gear, switchboards & cables generally examined & insulation test carried out.

The general lighting & power installation throughout vessel was generally examined & found in good order following repairs & alterations. The non flameproof fittings in combustible space were stripped out & flameproof fittings substituted; controlling switches removed from space & installed in accommodation above. An insulation test was carried out.

Sea trials were carried out when the electric propulsion equipment was examined under working conditions at full speed & during manoeuvring. The equipment operated satisfactorily.

The electric propulsion equipment & the general electrical installation are, in my opinion, eligible to be accepted subject to being examined & found in accordance with the plans when approved.

Drawings of the equipment were not available until the day the vessel sailed, and the plans forwarded with the Secretary's letter of the 10th July 1947 until the day following her departure from the Port.

Photostat copies of the above plans have been forwarded to London Office for consideration together with an Electrical Installation and Equipment Book.

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Lloyd's Register  
Foundation

"ESSE BIRMINGHAM"

The machinery of this vessel is, generally, as follows;

- Main turbo alternator. GEC. 2500V. 1500A. 65 cycles. 3450 rpm.
- 2 Aux " " GEC. 525 KW each. Type S-162. Geared 56u5/120 rpm.
- 1 " " GEC. 50 KW. Type DS120M. 3600 rpm.
- 1 Diesel alternator. 45 KW. 4 cyl. 4 SC.S.A. Type FuSS 420 rpm (homimer Diesel).
- Main propulsion motor GEC. 6000 HP at 90 rpm. Type TSM 80.
- Main condenser - underhung from main turbine - Ingersoll Rand.
- Auxiliary condenser. - Ingersoll Rand.
- Thrust shaft. 14½" diam.
- Intermediate shaft. 16½" diam.
- Screw shaft. 18½" diam. hines - after end 20½". fwd end 21"
- Stem tube. Cast steel 110" dia.
- Stem bush. Gun metal. length of bearing 4'3½". Wood 1½" thick.
- Propeller. 4-bladed solid bronze. 19'6" diam. Pitch at 6'6" - 14'6". 138.3 #.
- Main circulating pump. E.D. by 125 HP GEC motor.
- 2 main condensate pumps, each ED by 25 HP GEC motor.
- 2 main turbo feed pumps. GEC turbines type DS114M. Ingersoll Rand 6 stage pumps.
- 1 Auxiliary feed pump. Vertical duplex steam.
- Forward bilge pump (engine room) 145 G.P.M. E.D. geared drive.
- Bilge pump (fwd. pump room). Vertical duplex steam.
- After bilge pump (thrust space). 145 G.P.M. E.D. geared drive.
- Fire & GS pump. 450 G.P.M. E.D. drawing from sea, bilges or ballast.
- Fire pump (thrust space). 450 G.P.M. E.D. drawing from sea or bilges
- Auxiliary condenser circulating pump. E.D. by GEC motor.
- " " Condensate " do.
- 2 fuel oil transfer pumps (engine room). E.D. by GEC motors 10/20 H.P.
- 2 " " pressure " " " 3¾/½ H.P.
- 2 " " heaters (boiler room)
- 2 " " filters. " now efficiently screened & locking device fitted on covers.
- 2 lubricating oil pumps. ED by GEC 5HP motors.
- 2 " " gravity tanks with electric alarms and containing sufficient oil for 12 minutes lubrication from the time the alarm starts.
- Windlass. - steam
- Steering gear. - electric hydraulic, 2 independent units.
- Fire extinguishing arrangements - steam and CO<sub>2</sub> operated from outside machinery space.
- Fuel oil pressure and transfer pumps can be stopped from outside machinery space.
- Extended spindles fitted to essential fuel oil shutoff valves.
- Pumping Arrangements.
- Engine room bilge direct suction. 1 - 4" port side forward
- main <sup>bilge</sup> injection - 1 - 18" port side

## S.S. "ESBO BIRMINGHAM"

Pumping Arrangements.

Thrust space bilge direct suction, 1-4" inboard.

Indirect bilge suction.

Engine and boiler rooms,	4 at 4"	2 at 3½"
Propulsion motor well,	1 at 4"	
Thrust space	3 at 4"	
Forward pump room	2 at 2½"	
Deep tank under pump room	1 at 6"	
After cargo tank	2 at 6"	(blanks in pump room)
Fore peak	1 at 4"	

Ballast main, 4" B.

Sea Values.

main injection,	high	26"	(bilge injection 18")
do.	low	26"	
main discharge,		26"	
Aux condenser injection,		13"	
Fire & GS pump,		6"	
Sanitary pump,		2½"	
Boiler blow down		2"	
Evaporator blow down		2"	
Forward pump room		12" port side.	
do.		12" starboard side.	

H.W.