

THE FAIR ENGINE ROOM REGISTER

BY

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For ships which come under Class Authorities, the Fair Engine Room Register will, in due course, be replaced by a different system of recording. For many ships, however, it is likely to remain for some years.

INTRODUCTION

This article suggests a standard procedure for checking and auditing the quarterly Engine Room Register kept by the Engineer Officer's Writer in steam driven ships. The Author has had some experience in trying to audit such records, and these notes are the results of that experience. It is appreciated that the quarterly register, as we know it now, will eventually be superseded by other methods of documentation devised by Class Authorities but it is presumed that some classes of ships will still use the register in its present form.

The register can give a surprisingly clear picture of the efficiency with which the department and the machinery of a ship are being run. It should, therefore, be a first principle for the Engineer Officer of a ship to see that the book is an intelligent record of proceedings which can be easily examined. One that shows many errors in addition and subtraction, incorrectly calculated boiler hours, boilers being left at 'W' for long periods without steam, boiler water being incorrectly treated, tests and examinations overdue or not carried out at all, ships draught never taken, lubricating oil separator rarely run, will, at a glance, show its general unreliability. A 'cooked' register can also be distinguished at once and it is much easier to write an honest account and try to abide by the rules.

Producing a Good Register

If the Engineer Officer and his writer are keen to produce a well written register, they must have some standard method of checking their work, and such a standard for checking Small Ship Registers, S.467(52) is suggested in Part II of this article. When reading through this audit procedure some of the checks will seem ludicrous, but all have, in the Author's experience, at one time or another shown a mistake.

The entries required in both the Small Ship Register and the Large Ship Register, S.353(51), are compared in tabular form in Part III, and the audit procedure for the Large Ship Register can thus be interpolated from the procedure for small ships. The object of these proposals is to try to present some constructive guidance as a supplement to the notes contained in the various register instructions and the articles in B.R.16(50) in the hope that Engineer Officers and their writers will find it of value.

There is a popular school of thought which is prepared to condemn the Fair Engine Room Register as a useless document that, once written, is never referred to again. It is my experience, both as Engineer Officer of a ship and

when acting for an Administrative Authority that, if they are called in for inspection, it is not from idle curiosity, but in order that they may be properly checked and audited. Admittedly this form of documentation may not be of much value to a Class Authority, but it can still be of value to an Administrative Authority. Of the two steam registers in use, that for small ships is the better, but even this could be re-designed to make it easier to compile and check.

It seems that, whatever improvements in documentation are adopted, there must be some sort of fair register which presents an auditable account of the working, maintenance, repair, testing and examination of boilers and machinery and the expenditure of fuels, lubricants and water, otherwise the Engineer Officer of a ship will be in the equivalent position of a bank manager, or perhaps a wine caterer, who is not required to keep any accounts for audit !

I would personally be sorry to see the old register superseded entirely by a system of documentation which relies on ticks and crosses on a prepared chart. The unscrupulous could run the serviceability reservoir empty during a brief term of office with such a system, and the Administrative or Class Authority might well be none the wiser until too late.

PART II

A GUIDE FOR CHECKING THE FAIR REGISTER OF STEAM DRIVEN SHIPS UP TO AND INCLUDING DESTROYERS (S.467)

(Revised November, 1952)

Quarterly Statement of Fuels and Lubricating Oils—Page 1

Check :—

- (a) That receipt of fuels and lubricants and sources of supply are shown on the appropriate days in the daily record and that receipts shown in the daily record are shown on Page 1.
- (b) If the totals of fuels and lubricants taken on charge at the beginning of the quarter are shown in the daily record on the first day of the quarter, check that these agree with the figures on Page 1.
- (c) Additions of total receipts during quarter.
- (d) Total expenditures agree with expenditures shown in the abstracts of consumptions, Page 22.
- (e) That the types of lubricants used are entered at the head of the columns.
- (f) That any fuels and lubricants discharged are shown in the daily record, and any discharges shown in the daily record are entered on Page 1.
- (g) Mathematical balance of the summary for the quarter.

Complement : Particulars of Changes : Ratings Trained—Pages 2 and 3

Ensure that :—

- (a) Statements of changes in complement and awards of certificates correspond with the complement return for the quarter.
- (b) A notation of officers and ratings joining, or leaving, is entered in the daily record on the days applicable.

Daily Treatment of Boilers—Pages 4 to 15

Check that :—

- (a) Page headings are entered correctly.
- (b) The hours boilers were under steam correspond to the time between which boilers were connected and shut down, shown in the daily record, making allowances for any adjustment of clocks when changing zone times.
- (c) The boiler states are correct, compared with entries in the daily record, and that they are underlined when the state has changed during the day.
- (d) The alkalinity and salinity readings are within the limits laid down in B.R.16(50), Article 190, para. 5(b) and (c) : that readings have been taken on all occasions required by B.R.16(50), Article 185, para. 3(d) and Article 192, para. (2) (b) : that boiler compound added is shown in the appropriate columns.
- (e) Boiler hours under steam re-start at zero, in each column affected, after the various types of clean.
- (f) On occasions where boilers have been pumped up from E.O. to W.W. there is a corresponding increase in the water used for M.U.F. shown in the abstract of consumptions.

Quarterly Abstract of Boilers—Page 16

Check :—

- (a) That column headings are entered correctly.
- (b) That the total number of hours the boilers have steamed during the quarter is correct and is shown to the nearest hour.
- (c) The number of days that the boilers have been in various states is correct.
- (d) That the dates of the last cleans correspond with the entries in the register or any previous reports.
- (e) That the date when the last wear and waste test was carried out is correct.
- (f) That the dates on which the next boiler clean and wear and waste test are due agree with the regulation intervals between cleans and tests.
- (g) That the durability of the boilers and fittings agree with the last wear and waste test report, allowing for the time elapsed since the last wear and waste test.

Spare Gear Removed from Ship—Page 17

Check against authority for removal, and that a notation has been made in the daily record when gear was removed. Also check that any spare gear removed in the past, and not yet returned, has continued to be entered in successive registers.

Daily Abstracts of Distances Run and Consumptions—Pages 18 to 23

Make sure that :—

- (a) All page headings and column headings for lubricating oil types are correctly entered.

- (b) Receipts and discharges of feed water and ships water are entered in the daily record, and any receipts and discharges entered in the daily record are shown in the abstract.
- (c) The totals under the various headings, both monthly and quarterly, are correct.
- (d) The feed water and ships water accounts balance daily, monthly and quarterly, that is, that the water remaining at the beginning of the day, month or quarter, the water distilled and the water received, minus the water used, the water discharged and run down to bilge equals the water remaining at the end of the day, month or quarter.
Note, however, that if the water run down from boilers is entered it must not be taken into account in the balance above, as this water was already accounted as used for M.U.F. when it was pumped into the boilers.
- (e) The conversion of the Diesel fuel consumed from gallons to tons is correct.
- (f) The time under way and the time awaiting orders equals the total time between which main engines were ordered and finished with, shown in the daily record, making allowances for any adjustment of clocks when changing zone times.
- (g) No auxiliary expenditure of F.F.O. is shown on days when there has been a main expenditure, (B.R.16(50), Article 33).
- (h) The expenditure of fuels, lubricants and water is reasonable and consistent with the working of the machinery on each day, and that the distance run is compatible with the hours under way.

Daily Abstract of Working Auxiliary Machinery—Pages 24 to 53

Check :—

- (a) That page and column headings are entered correctly.
- (b) The addition of total hours run, and that daily entries have been made to the nearest hour, making allowances for any adjustment of clocks when changing zone times.
- (c) That previous totals are correctly carried over from month to month and entered above or below the diagonal line as appropriate.
- (d) That overhauls are shown, and that a fresh series of running-hours are started after overhauls.
- (e) That the auxiliaries shown as running daily are consistent with the working of the machinery shown in the other parts of the register, i.e. if No. 1 boiler is steaming then No. 1 boiler room auxiliaries are shown as having been run.
- (f) That, when applicable, the lubricating oil separators have been run and tests taken, as required by B.R.16(50), Article 58(5).

Periodical Tests and Examinations—Pages 54 to 63

Check that tests and examinations that are applicable have been recorded and that any tests or examinations, made during the quarter covered by the register, are also shown on the daily record on the day they were carried out.

Daily and Weekly Record—Pages 64 to 119

Make sure that :—

- (a) All page headings are entered correctly.
- (b) The daily and weekly remarks are adequate to describe the working of machinery, employment of hands, and repairs and examinations carried out by ship and dockyard staffs.
- (c) The following tests and examinations have been entered :—
 - (i) Turning main and auxiliary machinery not in use daily. (B.R. 16(50), Article 50).
 - (ii) Working safety valve hand easing gear, weekly. (B.R.16(50), Article 208).
 - (iii) Creep test of telemotor system, weekly. (B.R.16(50), Article 262).
 - (iv) Telegraphs, weekly and before getting under way. (B.R.16(50), Article 8 and 261).
 - (v) Steering gear, before getting under way. (B.R.16(50), Article 263).
 - (vi) Temperature of F.F.O. tanks, daily and weekly. (B.R.16(50), Article 441, para. 3(d), (e) and (f)).
 - (vii) Tests of main and reserve feed tanks, weekly. (B.R.16(50), Article 192(c)).

Should any tests be discontinued during a prolonged refit period, care should be taken to check that they are done before the machinery involved is put into use.

- (d) The notice for steam and change of notice has been recorded as required by Register Instructions, para. 20.
- (e) The draught of the ship has been shown on the occasions required by Register Instructions, para. 19.
- (f) If there is a delay of more than one hour in getting under way after main engines are ordered, the reason is noted as required by B.R.16(50), Article 46, para. 2(b).
- (g) The register has been signed by the Engineer Officer daily and weekly, and by the Commanding Officer weekly.

Flysheets

Check that all totals for the quarter correspond with entries in the register ; full power data and readings are correct, and that any special reports, called for by Admiralty Fleet Orders, have been made.

PART III**TABULAR COMPARISON**

Notes:—

- (i) Figures in brackets in Column 1 refer to B.R. 16(50).
- (ii) Figures in brackets in Columns II and III refer to the instructions in the front of the respective Engine Room Registers.

TABLE I

<i>Fuels, Lubricants and Water</i>		<i>Engine Room Register S.467 (Nov., 1952)</i>	<i>Engine Room Register S.353 (June, 1951)</i>
(1)	Daily and Quarterly expenditure of fuels and lubricants, and quantities remaining on charge	Page 1 and Daily Abstract of Consumptions	Fuel and Lubricating Oil Statement. Daily Record and Daily Abstract of Consumptions
(2)	Feed Water : account of expenditure, etc.	Daily Abstract of Consumptions	Daily Abstract of Consumptions
(3)	Ships Water : account of expenditure, etc.	Daily Abstract of Consumptions	Daily Abstract of Consumptions
(4)	Receipts and discharges. Type, amount, by or to whom and when supplied: (i) Fuels (ii) Lubricants (iii) Water	Page 1 and Daily Record (No. 18) Page 1 and Daily Record (No. 18) Daily Abstract of Consumptions and Daily Record (No. 18)	Page 10 (No. 7) Page 11 Daily Abstract of Consumptions

TABLE II

<i>Boilers</i>		<i>Engine Room Register S.367 (Nov., 1952)</i>	<i>Engine Room Register S.353 (June, 1951)</i>
(1)	Time under steam in hours and minutes	Daily Treatment of Boilers (No. 5)	Daily Record and Daily Treatment of Boilers (No. 6)
(2)	Change of state of boilers (underlined)	Daily Treatment of Boilers (No. 6)	Daily Record and Daily Treatment of Boilers (No. 6)
(3)	Time of lighting up, connecting and shutting down boilers	Daily Record (No. 16)	Daily Record (Nos. 3 and 6)
(4)	Test of steaming boilers, daily (192(2)b)	Daily Treatment of Boilers	Daily Treatment of Boilers
(5)	Test of non-steaming and W.W. boilers, weekly (185(3)d) and (192(2)b)	Daily Treatment of Boilers	Daily Treatment of Boilers
(6)	Departure from authorized treatment of boilers (185(5)f)	Daily Treatment of Boilers (No. 23)	Daily Treatment of Boilers
(7)	Treatment of boilers with compound (190(5)f)	Daily Treatment of Boilers	Daily Treatment of Boilers
(8)	Quarterly figures for hours steamed and total days at various states	Quarterly Abstract of Boilers (No. 7)	Quarterly Abstract of Boilers
(9)	Durability of boilers from last wear and waste test figures	Quarterly Abstract of Boilers (No. 7)	Quarterly Abstract of Boilers

TABLE III

	<i>General Information</i>	<i>Engine Room Register S.467 (Nov., 1952)</i>	<i>Engine Room Register S.353 (June, 1951)</i>
(1)	Draught of ship before leaving and after entering harbour	Daily Record (No. 19)	Daily Record (No. 2)
(2)	Draught of ship on each Saturday in harbour if not taken during week	Daily Record (No. 19)	Not Applicable
(3)	Notice for steam and change of notice	Daily Record (No. 20)	Not Applicable
(4)	Use of auxiliary exhaust	Not Applicable	Daily Record (Nos. 3 and 6)
(5)	Working of main and auxiliary machinery	Daily Record for main engines and Daily Abstract of auxiliary machinery (Nos. 12, 13 and 17)	Daily Record (No. 3)
(6)	Notation of any abnormal occurrence and probable cause	Weekly Record	Daily Record (Nos. 1 and 3)
(7)	Times man engines ordered. Reasons if more than one hour in getting under way (46(2)b)	Daily Record (No. 17)	Daily Record — Special Remarks (No. 4 (c) and 5)
(8)	Times of trying main engines	Not Applicable	Daily Record (No. 3)
(9)	First and last movement of main engines	Not Applicable	Daily Record (No. 3)
(10)	Time finished with main engines	Daily Record (No. 17)	Daily Record (No. 3)
(11)	When lubricating oil separators are run	Daily Abstract of Auxiliary Machinery	Daily Record
12 (i)	Test of water separated one hour after getting under way and daily at sea (59)	Daily Abstract of Auxiliary Machinery	Daily Record
(ii)	Test of water separated day after entering harbour and weekly in harbour (59)	Daily Abstract of Auxiliary Machinery	Daily Record
(13)	Test of main and reserve feed tanks (192(c))	Weekly Record	Daily Record (No. 10)
(14)	Distance run and hours under way	Daily Abstract of Consumptions	Daily Record and Daily Abstract of Consumptions
(15)	Repairs and examinations by ships staff	Daily Record as progressed (No. 21)	Daily Record as completed, date progressed to be given. Record of Examinations & Repairs Pages 111-123 (No. 3)

TABLE III (cont.)

<i>General Information</i>		<i>Engine Room Register S.467 (Nov., 1952)</i>	<i>Engine Room Register S.353 (June, 1951)</i>
(16)	Repairs and examinations by dockyard (93(2))	Weekly Record as progressed (No. 23)	Daily Record as progressed with details : Number of workmen employed on board : references in Record of Examinations & Repairs (No. 3)
(17)	Officers and ratings joining, leaving and absent from duty (32(5))	Page 3 (No. 23)	Daily Record
(18)	Removal of spare gear from ship (67(5))	Page 17 (No. 23). Continued in successive registers until replaced	Daily Record : Special Remarks and back of register pages 111-123 (No. 4(b)). Continued in successive registers until replaced
(19)	Signature of Engineer Officer (32(2))	Daily Record Weekly Record	Daily Record
(20)	Signature of Commanding Officer (32(2))	Weekly Record (No. 22)	Weekly in Daily Record

TABLE IV

<i>Coal Fired Ships</i>		<i>Engine Room Register S.467 (Nov., 1952)</i>	<i>Engine Room Register S.353 (June, 1951)</i>
(1)	Description of coal received (451(3))	Daily Record (No. 23)	Daily Record Special Remarks
(2)	Periods for which coal bunker lids are off (455(2))	Daily Record (No. 23)	Daily Record Special Remarks
(3)	Temperature of coal bunkers (457)	Daily Record (No. 23)	Daily Record Special Remarks

TABLE V

<i>Examinations and Tests</i>		<i>Engine Room Register S.467 (Nov., 1952)</i>	<i>Engine Room Register S.353 (June, 1951)</i>
(1)	Turning main and auxiliary machinery daily (50)	Daily Record	Daily Record Special Remarks
(2)	Telegraph control shafting: weekly and before getting under way (8) and (261)	Daily Record	Daily Record Special Remarks (No. 11)
(3)	Safety valve lifting gear both under steam and not under steam. Direct acting valves to be taken off their seats (208)	Daily Record	Daily Record Special Remarks
(4)	Creep Test—weekly (263)	Daily Record	Daily Record Special Remarks
(5)	Temperature of F.F.O. tanks : weekly and daily (441(3) (d), (e) and (f))	Daily Record	Daily Record Special Remarks (No. 10)
(6)	Magazine floods and sprays and associated fittings (523(2))	Daily Record and Periodical Tests and Examinations, Page 54	Daily Record Special Remarks (No. 11)
(7)	Friction test of shafting (104(4))	Daily Record (No. 23)	Daily Record Special Remarks
(8)	Use of shore water and sea water in boilers (190(1) (b) and (c) 190(2)b)	Abstract of Consumptions, Daily Record— In red ink if not distilled water (No. 23)	Abstract of Consumptions and Daily Record. Special Remarks—In red ink if not distilled water (No. 23)
(9)	Method of avoiding priming (190(5)d)	Daily Record (No. 23)	Daily Record Special Remarks
(10)	Emptying of boilers (195(2))	Daily Record and Daily Treatment of Boilers (No. 23)	Daily Record Special Remarks Daily Treatment of Boilers
(11)	Periodical Tests : intervals 3 months and/or over	Daily Record and Pages 54-63	Daily Record Special Remarks and Pages 124-129 (No. 4(d))