M.R.O. 1—77,066—8-6-31.

(1) Number of pages 1 2 0

(2) Date of repair 1 2 2 7

(3) Initials of the Referencer

# MADRAS RECORD OFFICE.

## Government of Madras.

Public works DEPARTMENT.

G.O. No. 320-21 Press Mis.

614-16

Dated 26 1 1870.

***Not to be folded or roughly handled***

No. 614. Read the following letter from the Consulting Engineer for Railways, to the Secretary to Government, Public Works Department, dated Madras, 4th January 1870, No. 1:—

IN continuation of my letter, dated the 3rd June 1869,* No. 179, I have the honour to submit a letter† from the Agent of the Great Southern of India Railway giving cover to a copy of a communication from Mr. Bruce, the Company's Consulting Engineer, upon the subject of testing engine boilers.

* *Vide* G. O., 29th June 1869, No. 2,112.
† No. 3,248, 15th December 1869.

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From the Agent, of the Great Southern of India Railway, to the Consulting Engineer for Railways, dated Negapatam, 15th December 1869, No. 3,248.

WITH reference to your docket, No. 333, dated the 16th October last, I forward herewith copy of a letter from Mr. Bruce conveying his remarks upon the subject of "Boiler incrustation."

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From G. B. BRUCE, Esq., to the Secretary to the Great Southern of India Railway, dated 2, Westminster Chambers, S. W., 18th October 1869.

BOILER TESTS.

I DULY received the paper forwarded with yours of 15th June last having reference to the explosion of a locomotive in Bombay, and the reports of various Locomotive Superintendents in India upon the question of regular testing of locomotive boilers; and also theOrder of Government based upon the report of their Consulting Engineer, which Order is dated April 1869, No. 1,098.

2. I have carefully examined the whole of these as well as the letters of Mr. Sheward upon the same subject. I think that Mr. Sheward, in his letter of 6th May 1869, has correctly described the mode generally in use in England as to the watching and examination of the state of the boilers. The Engine Drivers have books into which at the end of each day they make entries regarding the condition of their engine. These are examined by the Shed Foreman, and, if necessary, the engine is kept in the shed for further examination, and not sent out again to work until any complaints have been thoroughly sifted and repairs made accordingly. The first link on the chain of examination is the day-to-day experience of the Driver and his record accordingly in this book. On some lines of railway the boilers are tested once a year by hydraulic pressure without any reference to the reports made by the Driver, but on other lines no such test is applied unless the Locomotive Foreman has reason to suspect from the complaints of the Drivers that there is something wrong. On no railway that I am aware of are the tubes ever taken out and the engine thoroughly dismantled for the simple purpose of examining the boiler. As a rule boilers do not require repairs until the tubes are burnt through, when, of course, a careful examination of every part internally is made before renewing the tubes; and, as the duration of a set of tubes may be (in round numbers) said to be 100,000 miles, run, the object aimed at by the Consulting Engineer to the Bombay Government is necessarily gained, inasmuch as, at or about the time when the engine has run that distance, new tubes being required, there is the opportunity for thorough internal examination. There is no such rule in force by the Government in England as the dismantling of an engine at certain fixed times, and I should deprecate the introduction of such a rule into India. With the thousands of locomotives that work in England, it is the rarest thing possible to hear of the explosion of one, and you cannot lay down rigid rules of the kind adverted to without relieving both the Drivers and the Locomotive Superintendents of the responsibility which fairly rests upon them to exercise care and judgment in the discharge of this part of their duty. However such an order may be accompanied by a reservation that the Company is not relieved of its responsibility, it is contrary to human nature to feel responsibility of acting according to iron rule apart from the exercise of judgment. Drivers and Foremen, from constant

Consulting Engineer for Railways

hourly experience, can ascertain with wonderful accuracy the condition of their engines, and the fact already adverted to of the extreme rarity of accidents shows that it is as unnecessary as undesirable to lay down any fixed rules upon the subject. In testing boilers with hydraulic pressure the usual practice is to test them to double the working pressure, and I think that at all events such tests should not be less than 50 per cent. in excess of the working pressure. I observe that the Bombay Superintendent proposes to use hot water in testing his boilers by hydraulic pressure. The same effect is gained probably more thoroughly by filling the boilers quite full of water and then heating the water up to the required pressure at which it is to be tested without the use of the hydraulic press at all. The strains thus produced are considered to be more thoroughly like the ordinary working strain upon the engine, and on that account this mode of testing is preferred in some quarters.

3. As to the use of Baker's Anti-incrustrators I have no faith in the application of any of these things, and the probability is that they will do more harm than good where used. This at all events has been the experience up to the present time in the country. I certainly would not recommend its adoption on the Great Southern of India. I know of no means of keeping the boilers clean where the water is inferior except more frequent washings out where the water is bad. It would be worth while to see whether, by a careful examination of the country, good water could not be got, because a little expense to secure this would very soon re-pay itself in the greater efficiency and the smaller repairs required in the Locomotive Department.

4. I return the papers herewith.

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No. 615. ORDER THEREON, 26th January 1870, No. 320.

RAILWAY, No. 70.

ORDERED that these papers be forwarded to the Government of India.

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R. E.,
*Secretary to Government.*

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No. 616. DOCKET No. 321, dated 26th January 1870.

COPY of the above forwarded to the Government of India in continuation of the docket from this office, No. 2,113, dated 29th June 1869.

(True Extract.)

Colonel, R.E.,
*Secretary to Government.*

Exd. A. S. Rodgers.

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No. 1

CONSULTING ENGINEER'S OFFICE,

**Railway Department.**

No. 1

From Major J. H. M. Shaw Stewart, R.E.,
*Consulting Engineer for Railways,*

To Colonel, C. A. Orr, R.E.
*Secretary to Government,*
*Public Works Department,*
*Fort Saint George.*

SIR,

In continuation of my letter dated
× Vide G.O. 29th June 1869, No. 2112 the 3d June 1869, × No. 179, I have the honour
* No. 3248. 15 Dec. 1869. to submit a letter* from the Agent of the Great Southern of India Railway, giving cover to a copy of a communication from Mr Bruce, the Company's Consulting Engineer, upon the subject of testing engine boilers.

I have the honour to be
Sir
your most obedient servant

Madras
4th January 1870

Major, R.E.
Consulting Engineer for Railways

Public Works Department
No 320 23

Proceedings of the Madras Government
Under date the 26th January 1870

Read the following.

From the Consulting Engineer
for Railways. } No 16 of 4th January 1870

Enclosed that there
from be forwarded
to the Government of
India.

No 327

To The Court Juror
for Railways.

Rockhill No 11 dated
Copy of the above
forwarded to the Govern-
ment of India in
continuation of the docket
from this Office
No

No 614

Pro. of Govt. for January

RAILWAY DEPARTMENT.

No. 16.

From

The Consulting Engineer
for Railways,

To

The Secretary to Government,
Public Works Department,
Fort Saint George.

Dated 4th
Received 5th } January 1870.

No. 1

Ltr. 2 Vs.

Submitting a letter from the
Agent of the Great Southern of
India Railway regarding the
subject of testing engine
boilers.

No 320 to 315 26 January 1870

No. 2113 dated 29

June 1869.

No. 2113 dated 29 June 1869 -

Cue 16.

Govt. of {1870} Orders.

PUBLIC WORKS.

To The Consulting Engineer for Railways

Dated 1
Read.

G. O. 26 January 1870. No. 320 & 321

Nos. 611 - 615-616.

Engine Boilers (Rly) Replying orders on the letter from the Consulting Engineer submitting one from the Agent of the G.S.J. Ry on the subject of testing Engine Boilers -

Engine Boilers A Copy of letter No on the Cons. Engr's letter submitting one from the Agent of the G.S.J. Ry on the subject of testing Engine Boilers, forwarded to the Secy to the

Dec 31/70.