Public Works (1898) Department.

B

Steam Prot

V

G.O. No. 1741 W

DATED 8 July 98

[Despatch Abstract.]

Report of the Inspector of Steam-boilers & Steam-Mines, Madras.

Reviewing the ——— for 1897-98 & adverting its publication in the last Fort St George Gazette.

Indexed.

[P.W.D. 1,000—12-2-98.]

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Berth Appendices

BUILDINGS AND ROADS.
CIVIL WORKS.

Government {1898} of Madras.

PUBLIC WORKS.

Recd. } 1898. *Enclosures*

Regd. } *Spare copies*

G.O., No. 1741 W., 8th July 1898.

JULY.

Report of the Inspector of Steam-boilers and Prime-movers, Madras

Reviewing the ~~—~~ Forest annual for ~~1897–98~~ and ordering its publication in the *Fort St. George Gazette.*

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

Read—the following paper:—

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Secretary to Government, Public Works Department, dated Fort St. George, 27th May 1898, No. 1013.

I have the honour to forward herewith the annual report of the Inspector of Steam-boilers and Prime-movers, accompanied by two statements in regard to boilers inspected and (1) licensed, (2) not licensed.

ENCLOSURE.

The first report of the Inspector of Steam-boilers and Prime-movers, Madras.

This is the first report since the organisation of the office, and as such it embraces the work of the office since 1st May 1895, the date of assumption of charge of office by the late Mr. J. A. A. Turner, M.I.M.E., who was appointed to be Inspector of Steam-boilers and Prime-movers, Madras, under the Madras Steam-boilers and Prime-movers Act III of 1893 and who continued to be in office till the 4th July 1895, when on account of his ill-health he was obliged to resign his appointment.

2. The work during Mr. Turner's term of office was initiative in character, but the Boiler Inspector has duties attached to his office other than those performed under Act III of 1893, viz., the inspection of machinery in connection with Municipal Water Works throughout the Presidency, and in this capacity Mr. Turner visited the works at Tanjore, Trichinopoly and Madura.

3. After Mr. Turner's death, Government suspended the Act until the 1st February 1897.

4. The undersigned was appointed on 5th December 1896 and took charge on the 18th January 1897.

5. Appended to this report is a statement of all boilers situated in the City of Madras which have been inspected by the Boiler Inspector during the years 1896–97 (a portion) and 1897–98; the fees collected up to 31st March 1898 amounted to Rs. 3,612.

6. Before any license was issued each boiler was subjected to hydraulic test; in many instances the Boiler Inspector had to make as many as three journeys before applying the test owing to the bad condition of boiler mountings; in a few instances, it was evident that the cones of the feed, safety and stop valves had never been ground in; boiler mounting joints and mud hole joints had been allowed to leak causing plates in some instances to corrode and wear away sooner than they should have done. It was pointed out to the owners that if such leaks and inattention to valves were continued the boilers would soon become obsolete; with attention such boilers would last twenty to twenty-six years; and that if boilers did not receive proper care, they could not be expected to last more than a few years. In cases of corrosion, in order to arrest it, metallic zinc was recommended to be suspended inside of boilers below water line.

7. Several boilers were found with a large amount of scale on the plates internally; this can to a great extent be avoided, especially, in the larger type, as they can be opened out and cleaned by scaling hammers every month in those districts where the water is bad. A boiler that is kept free from scale is much more economical and safe than a dirty one and boilers that become scaled especially if thickly so, are dangerous owing to the water not being able to reach the plates; because, with fire on one side of a plate and no water in contact with it on the other, the flame

draws the plate down towards the fire and is likely to cause the plates to open out at seams, &c. As regards the smaller type of boiler which it is impossible to enter and clean with chipping hammers a good plan to maintain them free from scale is to fill the boiler at mid-day each day until the glass is full, and then blow off until the water shows itself at the centre of the glass gauge; if owners would only allow sufficient time for the above process, it would materially assist in keeping boilers of the smaller sizes clean. Owners were advised to apply the aforesaid method. In many cases half a gallon of kerosine oil and in some other instances eucalyptus oil was recommended to be injected into the boiler with the usual feed water daily for the purpose of removing scale that had become thickly deposited; this was attended with good results.

8. Fusible plugs do not seem to be recognised as an important item of boiler equipment because a large number of plugs were found scaled over as much as 1/32″ in thickness. Owners were informed that such an amount of scale on plugs of this description was dangerous. From plugs that were found in the above-mentioned condition scale was removed and the fusible metal renewed in the presence of the Inspector.

9. It will be noticed from the statement attached that a large number of boilers have had their pressure reduced; this was in a large measure due to the fact that the boiler so reduced had not been open to inspection by recognised Boiler Insurance Companies during the period of construction; the boilers generally were found weak in tube plates, rectangular bars and furnaces; shells as a rule are constructed by most makers with a good margin of strength to allow for wear and tear, and in cases where pressure was reduced because of the shells it was chiefly owing to reduction of material and general wear and tear. The reduction of pressure in such a large number of boilers alone proves the great necessity there was for all boilers to be periodically inspected.

10. If owners, when ordering new boilers, will require them to be constructed in accordance with the rules, they will be assured that the boilers would be capable of working at the pressure asked for.

11. Several boilers were required to have their safety valve area increased, additional stop valves fitted and wrought iron manhole covers fitted in lieu of the then existing cast iron covers and bridges. A few of the owners were refused licenses owing to their boilers requiring strengthening such as diagonal vertical and gusset stays fitting to steam domes and end plates of shells, likewise strengthening rings fitting to furnaces of boilers and shells patching.

12. It is desirable to state that the patching of boilers in Madras hitherto has been incorrectly carried out. When plates became corroded new plates were found placed on the outside of the boiler instead of the inside, the defective plate still being retained; if the defective plate had been cut away patches could then have been placed on the inside or outside with safety, but with a new cover plate outside over the defective plate it follows that the action is still at first on the old plate and then between the old plate and the patch as in time the old plate would become worn through owing to the corrosive action; on any sudden strain caused by expansion or contraction, patches of this description might be blown off; such a system of patching has been objected to by the undersigned and in several instances where he considered those patches dangerous the defective plates were ordered to be cut away and new plates or in other words lap patches placed on.

13. From this experience the Boiler Inspector agrees with many of the qualified Engineers in charge of Madras boilers that it would be advantageous to put clause 23 (*d*) of Act III of 1893 in force.

14. These remarks have been made to show the reasons which guided the Inspector in making recommendations when such defects were found.

15. It is satisfactory to report that wherever additions and alterations were considered necessary such were promptly carried out by the owners concerned, and there is reason to believe that the periodical inspection of boilers will ensure that boilers will be safer, work more economically and last longer than hitherto. It would be more satisfactory if all owners would retain the services of none but competent men to take charge of their boilers because it is absolutely essential that boilers should have the best of supervision, and it is regretted that this is not always the case. A number of the drivers were questioned as to the mode of procedure supposing the water in their boilers ran low; in some instances they stated that they did not know what should be done, and in one case which came to notice a driver lit the fire of his boiler with no water showing in the gauge glass column; it hardly reached the crown of combustion chamber, it followed that the crown plate became overheated but fortunately the fusible plug emitted its lead and saved an explosion of the boiler. It is presumed that the man did not know to what height the water should be in the glass gauge, otherwise he would not have lit the fire so as to have endangered his own life and the lives of the people surrounding him.

16. To the best of the undersigned's knowledge there is no boiler now working in the City of Madras above atmospheric pressure which has not been duly examined, tested and licensed.

17. In addition to discharging the duties as Inspector of Steam-boilers in the City of Madras the Boiler Inspector visited during 1897–98 the following pumping stations for the purpose of making complete survey of the engines, boilers and pumps that are situated at the respective municipal pumping stations:—

Madura visited twice.	Conjeeveram visited twice.
Dindigul visited thrice.	Kurnool visited once.
Trichinopoly visited thrice.	Cuddapah visited once.
Tanjore visited twice.	

18. After the Boiler Inspector made a survey of the several stations, complete reports on the condition of the machinery were forwarded to the respective municipal chairmen for their information and guidance with a request that wherever repairs were mentioned as required such ought to be carried out as early as practicable. The Inspector found on his second visits that the repairs, in most cases, were complete and others were in course of execution.

19. Wherever possible, indicator diagrams of the engines were taken for the purpose of determining the indicated horse power of the engines during the hours of harder work.

20. Several points were suggested by the Boiler Inspector for the better management and safer and more economical working of the machinery; these were adopted with satisfactory results. Fuel trials were also conducted for the purpose of ascertaining the amount of fuel expended per pump horse power for an ordinary day's work with the result that reductions were found to be possible in the consumption of both fuel and oil.

21. The undersigned is of opinion that the periodical inspection of the machinery at the municipal pumping stations will keep a check on the consumption of fuel and oil, and further more that the machinery will be maintained in a far better state of repair whereby municipalities will save more than the fees prescribed to be paid by G.O., No. 833 of 15th May 1895.

22. *Concluding Remarks.*—Inventories of valuable stock were maintained in this office during the year under report.

23. The staff has given entire satisfaction in the discharge of its duties.

FORT ST. GEORGE,
27th May 1898.

(Signed) H. T. WALTERS,
Inspector of Steam-boilers and Prime-movers.

ORDER—No. 1741 W., dated 8th July 1898.

Ordered to be published in the *Fort St. George Gazette* for general information.

2. His Excellency the Governor in Council is of opinion that much useful work has been done during the period under review and that private owners of boilers as well as the public generally may be expected to derive advantage from the suggestions made and precautions taken by the Inspector to ensure the economical and safe working of steam-boilers and prime-movers in the City of Madras.

3. The periodical survey of the engines, boilers and pumps belonging to mofussil municipalities is also likely to prove of the greatest utility, and municipal councils should be instructed to give effect, as far as practicable, to the Inspector's recommendations in regard to the repair and economical working of machinery.

4. The question of giving effect to section 14 of Act III of 1893, in regard to certificates of competency, will be considered separately.

(True Extract.)

Under Secretary to Government.

To the Superintendent, Government Press.
" Sanitary Engineer.
" Local and Municipal Department.

Exd. Shaik Karim.

Public Works (1898) Department.

CURRENT No. 5667

From

The Sanitary Engineer to Govt.,
Fort St. George.

Order

No. 1013

Dated 27th.May 1898.

Received
Registered 31-5 / 7-7-98
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SUBJECT.

Forwarding the annual report of the Inspector of Steam-boilers and Prime-movers, Madras.

W/39

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GOVERNMENT OF MADRAS.

No. 1013

OFFICE OF SANITARY ENGINEER,

Fort St. George, 27th. May 189 8.

Desk 27. May 1898

From

J. A. JONES, ESQ., MEM. INST. C.E., F.R.S.E.,

SANITARY ENGINEER TO GOVERNMENT,

To

The Secretary to Government ,

Public Works Department.

SIR,

I have the honor to forward herewith the Annual report of the Inspector of Steam-Boilers and Prime-Movers , accompanied by two Statements in regard to Boilers inspected and (1) Licensed (2) Not licensed.

I have the honor to be,

Sir,

Your most obedient servant,

Sanitary Engineer to Govt.

lsBh

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5. Appended to this report is a statement of all boilers situated in the City of Madras which have been inspected by the Boiler Inspector during the years 1896/97-- (a portion) and 1897/98; the fees collected up to 31st. March 1898 amounted to Rs 3612.

6. Before any license was issued each boiler was subjected to hydraulic test; in many instances the Boiler Inspector had to make as many as three journeys before applying the test owing to the bad condition of boiler mountings; in a few instances, it was evident that the cones of the feed, safety & stop valves had never been ground in; boiler mounting joints and mud hole joints had been allowed to leak causing plates in some instances to corrode & wear away sooner than they

should have done. It was pointed out to the owners that if such leaks & inattention to valves were continued the boilers would soon become obsolete; with attention such boilers would last twenty to twenty-six years; and that if boilers did not receive proper care, they could not be expected to last more than a few years. In cases of corrosion, in order to arrest it, metallic zinc was recommended to be suspended inside of boilers below water line.

7. Several boilers were found with a large amount of scale on the plates internally; this can to a great extent be avoided, especially, in the larger type, as they can be opened out & cleaned by scaling hammers every month in those districts where the water is bad. A boiler that is kept free from scale is much more economical & safe than a dirty one and boilers that become scaled, especially if thickly so, are dangerous owing to the water not being able to reach the plates; because, with fire on one side of a plate and no water in contact with it on the other, the flame draws the plate down towards the fire and is likely to cause the plates to open out at seams &c. As regards the smaller type of boiler which it is impossible to enter & clean with chipping hammers - a good plan to maintain them free from scale is to fill the boiler at mid-day each day until the glass is full, and then blow off until the water shows itself at the centre of the glass gauge; if owners would only allow sufficient time for the above process, it would materially assist in keeping boilers of the smaller sizes clean. Owners were advised to apply the aforesaid method. In many cases half a gallon of kerosine oil and in some other instances eucalyptus oil was recommended to be injected into the boiler with the usual feed water daily for the purpose of removing scale that had become thickly deposited; this was attended with good results.

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17. In addition to discharging the duties as Inspector of

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Madura---------visited-twice.

Dindigul---------do----thrice.

Trichinopoly-----do----thrice.

Tanjore----------do----twice.

Conjeeveram------do----twice.

Kurnool----------do----once.

Cuddapah---------do----once.

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19. Wherever possible, indicator diagrams of the engines were taken for the purpose of determining the indicated horse power of the engines during the hours of harder work.

20. Several points were suggested by the Boiler Inspect for the better management and safer & more economical working of the machinery-these were adopted with satisfactory results Fuel trials were also conducted for the purpose of ascertaining the amount of fuel expended per pump horse power for an ordinary day's work with the result that reductions were found to be possible in the oonsumption of both fuel & oil.

21. The Undersigned is of opinion that the periodical inspection of the Machinery at the Municipal pumping stations will keep a check on the consumption of fuel and oil, and furthermore that the machinery will be maintained in a far better state of repair whereby Municipalities will save more than the fees prescribed to be paid by G.O. No.833 of 15th. May 1895.

Concluding

Concluding Remarks.

22. Inventories of valuable stock were maintained in this office during the year under repott.

23. The staff has given entire satisfaction in the dis-hharge of its duties.

D. T. Fraser

Inspector of Steam-boilers & Prime-movers.

Office of the Inspector of Steam-boilers
and Prime-movers,
Fort St.George, 27th May 1898.

Statement A

Act III of 1893.

Statement showing boilers licensed in the City of Madras between the 23rd April 1897 and 31st March 1898.

Name of owner.	Place where boiler is situated	When made.	Horse Power.	Pressure in the lbs per □" Original	Pressure in the lbs per □" Limited	Date of License	Alterations & additions made & scantlings found weak which caused the reduction to boiler pressure.
Messrs. Massey & Co.	Cochrane Basin Road	—	8	80	80	23.4.97	Brass plugs fitted to fire box casing to improve washing out.
Governor Asylum Press	Mount Road	—	12	140	80	23.4.97	Shell & tube plate = 80 lbs pressure.
Messrs. Binny & Co.	Perambore	1893	55	175	175	23.4.97	Drain pipes fitting to glass water gauge column to arrest water from dripping on boiler.
" Best & Co.	1st Line Beach	1895	10	100	80	23.4.97	Stop valve fitting (steam). Bracing bars only = 80 lbs per □"
" Deschamps & Co.	Mount Road	—	15	80	80	23.4.97	
" C. Gopaul Nayagar & Sons	Cochrane Basin Road	—	6	70	35	23.4.97	Reduction of material by wear & tear, and Longitudinal stays = 35 lbs per □"
" Binny & Co.	Perambore	—	55	125	125	23.4.97	Drain pipes fitting to glass water gauge column to arrest water from dripping on boiler.
do	do	—	50	150	150	23.4.97	Feed stop valve, fusible plug & 6 vertical stays fitting
" Best & Co.	Rayapuram	—	10	70	70	23.4.97	Zinc suspended to arrest corrosion.
College of Engineering	Chepauk	—	8	80	80	23.4.97	Brass plugs fitting to fire box casing to improve the system of washing out roof bars tube plate and longitudinal stays = 80 lbs only.
Messrs. Simpson & Co.	Mount Road	—	14	100	80	23.4.97	Fusible plug fitting to furnace crown.
							— manhole door fitting in lieu of existing cast iron

	Carriage Factory	Kepery	1886	12	70	70	3·5·97		
125	do	do	1892	40	100	100	3·5·97	Fusible plug fitting to furnace crown	
5	do	do	1869	20	60	35	3·5·97	Reduction of pressure owing to wear & tear of material	
126	Madras Club	Mount Road	1896	5	80	60	23·4·97	Time to be suspended to arrest corrosion & pin fitting to safety valve weight to obviate it from slipping off lever. Certificate not produced, tension strength of material not known	
127	General Hospital	Genl: Hospital Road	1883	12	45	45	23·4·97	Gusset stays fitted to domes, furnace strengthened with doubling rings & fusible plug placed in furnace crown.	
128	do	do	1883	12	50	50	23·4·97	do	do
129	Madras Municipality	Rayapuram	about 1883	18	75	45	27·4·97	Tube plate & rectangular bars = 45 lbs.	
130	do	do	1883	18	75	46	27·4·97	do	do 46 lbs.
131	do	do	1886	22	80	80	27·4·97	Shield plates fitting to fire holes rings to arrest grooving of plates with fire tools.	
132	do	do	1886	22	80	80	27·4·97	do	do
133	Madras Electric Tramways Co.	Kepery	1895	55	140	120	23·4·97	Certificate not produced, tension strength of material not known, circumferential laps are not properly closed. Additional safety valve fitted.	
134	Madras Municipality	Municipal Workshops	about 1882	12	80	75	27·4·97	Tube plate & rectangular bars = 75 lbs only, strengthened manhole door fitting in lieu of existing cast iron	do

Madras Municipality	Municipal Workshop	about 1882	8	50	50	27.4.97		
do	do	about 1882	4	80	80	27.4.97	Lead plugs renewal.	
do	do	about 1879	12	50	45	27.4.97	Zinc suspended to arrest corrosion.	
do	do	about 1892	8	60	60	27.4.97		
do	Napier Park	about 1893	5	80	80	27.4.97	do	do
do	do	1882	8	50	50	28.4.97	Wear + tear = 50 lb per □"	
do	Kistnampet	1883	8	60	50	28.4.97	Mounting plugs repaired & joints refaced.	
do	do	1883	8	60	60	28.4.97	Certificate not produced, tension strength of material not known; circumferential joints of shell not properly closed.	
Madras Electric Tramways &	Vepery	1896	55	140	125	28.4.97	do	do
do	do	1896	55	140	125	28.4.97	do	do
Government Press	Mint Buildings	1890	11	70	70	3.5.97		
Venkatachellum	Poonamalle Road	1892	30	160	130	5.5.97	Certificate not produced, tension & strength of material not known; additional pipes fitted to blow off.	
do	do	1895	12	125	94	11.5.97	Tube plate = 94 lb per □"	
The Southern India Ginning & Weaving Co	Kayapuram	1889	40	100	100	20.5.97	Pressure gauge renewal.	
Messrs. Binny & Co	Perambore	1889	50	150	135	20.5.97	2 fusible plugs fitted to furnace crown. Manhole cover replaced by one this boiler having 4 segments as rebuilt.	

125	Messrs. Binny & Co.	Trambore	1893	55	175	175	20.5.97	Existing cast iron manhole door replaced by a wrought iron one.
126	do	do	1891	50	150	150	20.5.97	do do Zinc suspended to arrest corrosion.
127	Madras Arsenal	Vyasarpady	1894	10	80	80	22.5.97	Fusible plug fitting to crown of fire box, 1 steam stop valve fitted to boiler; zinc suspended to arrest corrosion.
82	do	Fort St. George	1890	8	125	125	22.5.97	Fusible plug fitted.
83	do	Gun Carriage Factory	1890	8	-	120	31.5.97	
124	Madras Ice Manufacturing Co. Ltd.	Bonamalle Road	1889	21	80	80	9.6.97	All mountings placed under repairs.
45	Harbour Trust Board	Beach	1885	15	80	65	9.6.97	Furnace of boiler = 65 lbs per □".
46	do	do	1894	6	80	80	9.6.97	
47	do	do	1885	4	60	60	9.6.97	Lead plug fitting to crown of furnace.
48	do	do	1891	12	80	80	9.6.97	
49	do	do	1886	4	50	50	9.6.97	Fusible plug fitting to furnace crown; zinc suspended to arrest corrosion.
50	do	do	1889	10	120	120	9.6.97	4 brass plugs fitting to fire box for improvement in washing out.

12	Madras Municipality	Mylapore	1895	4	120	120	9.6.97	Zinc suspended to arrest corrosion.
	do	Rayapuram	1895	4	120	120	9.6.97	
	do	Wallajah Road	1893	6	120	120	9.6.97	
	do	China Bazaar Road	1893	6	120	120	9.6.97	
	Madras Electric Tramways Co.	Kopery	1895	55	140	120	9.6.97	Certificate not produced, tension strength of material not known; circumferential seams not properly closed.
56	Madras Ice Manufacturing Co.	Poonamalle Road	1889	21	80	80	9.6.97	
57	P.W. Workshops	Seven Wells	1889	8	60	60	16.6.97	Cast iron door replaced by one of wrought iron
58	do	do	1882	12	80	50	16.6.97	Licensed for 9 months owing to corrosive condition of tubes & mud collector seating. Should the boiler be placed under a thorough repair steps will be taken to recover a higher pressure
59	do	do	1880	8	80	75	16.6.97	Pressure gauge renewal. Zinc suspended to arrest corrosion.
60	do	do		6	80	80	16.6.97	
61	Gun Carriage Factory	Poonamalle Road	1869	20	60	35	16.6.97	Wear & tear = 35 lb.; fusible plug fitted to furnace
62	do	do	1892	40	100	100	16.6.97	
63	Messrs W.E. Borham & Co.	Black Town	1876	6	80	50	16.6.97	Stop valve fitting to boiler; reduction of pressure owing to wear & tear.

11	Messrs. W. E. Botham & Co.	Black Town	1890	6	80	80	16.6.97	
12	D. Raju & Co.	St. Thomé	1889	20	80	60	16.6.97	Tube plate & rectangular bars = 60 lbs pressure only; all mountings were placed under repair.
	Madras Municipality	D'Mellows Road	1882	8	60	60	23.6.97	Fusible plug renewal, cast iron manhole door replaced by one of wrought iron; & tubes renewal.
	Madras Brick, Tile & Iron Works	Perambore	1887	16	60	60	23.6.97	Fusible plug fitting to fire box crown; all boiler mountings placed under repair.
	Messrs. Oakes & Co.	Peliams Broadway	1893	12	110	85	28.6.97	Pressure reduced owing to tube plate & rectangular bars.
	——do——	——do——	1887	10	80	75	28.6.97	All parts = 75 lbs per □"
	Southern India Spinning and Weaving Co.	Rayapuram	1896	50	150	145	7.7.97	Certificate not produced, tension strength of material not known; furnace = 145 lbs only vertical stays fitted to furnace.
71	Madras United Spinning & Weaving Mills Co.	Chulai	1889	40	100	90	7.7.97	——do—— ——do——
72	Messrs. Oakes & Co.	Mount Road	1887	6	80	52	7.7.97	Cast iron manhole door replaced with a wrought iron one Stay heads much reduced in fire box; should the firm see fit to renew stays, pressure can be raised.
	Madras Municipality	Municipal Workshop	1884	4	120	100	7.7.97	Wear & tear = 100 lbs only.
	Carriage [illegible] & Sons	[illegible] Road	1889	20	140	100	21.7.97	Wear & tear = 100 lbs only.

...rbour Trust Board	Harbour Works	1892	10	140	100	4·7·97	Wear & tear is m... ...d of reduction of pressure.
...ings. Arbuthnot & Co.	Washermenpet	1896	8	80	80	26...·97	
...th ...ical Stores	Mint Street	1883	6	50	45	29·7·97	Pressure reduced owing to large amount of scale on furnace that was exposed to impact of flame
...gent, Methodist Episcopal Press	Mount Road	1894	8	125	125	29·7·97	
...i P. W. Workshops	Seven Wells	-	10	80	55	7·8·97	Furnace = 55 lb per □"
Southern India Spinning & Weaving Co. Ltd.	Rayapuram	1889	46	125	110	14·8·97	Certificate not produced, tension strength of material not known which was the cause of reduction in pressure.
...ssrs. Binny & Co.	Perambore	1892	50	152·5	150	18·8·97	Cast iron manhole door replaced by a wrought iron one.
...do...	...do...	1889	50	100	100	18·8·97	Feed pipe renewal, cast iron manhole door replaced by a wrought iron one & 10 rivets renewal in gusset stays.
...do...	...do...	1895	55	180	180	18·8·97	Zinc suspended to arrest corrosion.
Madras United Spinning & Weaving Mills Co.	Chulai	1891	41	125	125	18·8·97	Cast iron manhole door replaced by a wrought iron one.
...ssrs. Binny & Co.	Perambore	1892	50	150	150	18·8·97	...do... ...do...
...Carriage van ...7"	...do...	1896	55	180	180	18·8·97	

137 ... Wagon ...
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s United	Chulai	189	46	125	125	18.8.97		
ing & Weaving Mills Co.								
ros. Arbuthnot & Co.	Washermenpet	1894	46	125	125	18.8.97	Zinc suspended to arrest corrosion.	
Binny & Co.	Perambore	1893	55	175	175	18.8.97	—	
uthern India inning and aving Co.	Kayapuram	1894	44	125	125	18.8.97		Cleaned replaced
eers. Binny & Co.	Perambore	1892	50	150	150	18.8.97	Cast iron manhole door replaced by one of wrought iron.	
do	do	1883	50	150	60	18.8.97	Reduction of pressure owing to furnace plates being found reduced by wear & tear	
Arbuthnot & Co.	Washermenpet	—	30	60	35	18.8.97	Pressure reduced owing to reduction in material by wear & tear. Diagonal stays fitted to steam dome.	
b. Gopaul Nayagar & Sons	Cochrane Basin Road	about 1883	10	80	60	18.8.97	Pressure reduced owing to wear & tear, all tubes renewal, also 18 rivets.	
Agent, Methodist Episcopal Press	Mount Road	1890	12	80	60	9.9.97	Furnace was found to sustain 60 lbs pressure. Six vertical stays fitted.	
Harbour Trust Board	Harbour Works	1879	6	60	45	10.9.97	Furnace = 45 lbs pressure only.	
Carriage Factory	Bonamalle Road	1879	14	50	50	10.9.97	Gusset stays fitted to end plates.	
do	do	1879	14	50	50	10.9.97	do	do

137 [illegible] Nagy & Sons

United Spinning & Weaving Mills Co.	Chulai	–	46	160	160	11.9.97		
Balakrishna & Saraswamma	Kirwattur High Road	1872	10	60	35	13.9.97	Rectangular bars removed & fire box crown made level. Rectangular bars = 35 lb pressure only	
do	do	–	13	60	40	13.9.97	Owing to reduction of material, pressure = 40 lb; strengthening ring fitted to furnace.	leaned replaced
Messrs. W. & J. Smith & Co.	Mount Road	1897	4	70	60	14.9.97	No certificate	
Harbour Trust Board	Harbour Works	1885	14	60	45	15.9.97	Vertical furnace = 45 lb pressure only.	
Madras United Spinning & Weaving Mills Co.	Chulai	1896	50	160	160	15.9.97		
Messrs. Massey & Co.	Cochrane Basin Road	about 1882	10	80	60	15.9.97	Renewal of fire box foundation frame; tubes & new manhole filled; pressure worked out generally to 60 lb per □".	
Binny & Co.	Perambore	1889	50	100	100	27.9.97	Fusible plug fitted to furnace crown. Cast iron door replaced by a wrought iron one.	
" Massey & Co.	Cochrane Basin Road	about 1889	9	80	65	27.9.97	Vertical furnace = 65 lb pressure only; set screw fitting to safety valve weight to obviate weight slipping off.	Tear
Madras Municipality	Municipal Workshop	1882	8	60	60	29.9.97		
137 a. R. Ippoo Natty Thomas & Sons	Natty Thomas	about 25 years	10	60	45	3.11.97	Wear & tear = 45 lb pressure only.	

	Tachellum	Poonamalle Road	1894	14	150	150	15.11.97	
12	Workshops	Seven Wells	1880	6	80	45	29.11.97	Rectangular bars = 45 lb per □"; cast iron manhole door replaced by a wrought iron one. Additional safety valve fitted; vertical furnace = 50 lb pressure only.
12	do	do	-	12	60	50	8.12.97	
	do	School of Arts	-	4	60	60	8.12.97	
	do	Seven Wells	1880	6	90	45	8.12.97	Vertical furnace = 45 lb pressure only
	do	do	1882	8	70	70	8.12.97	cast iron manhole door replaced by a wrought iron one. One 2" additional safety value fitted to boiler.
	dras Municipality	Westcott Road	1893	6	120	120	17.12.97	
	do	Mylapur	1897	2	80	80	17.12.97	
	do	Wall Tax Road	1884	4	100	100	7.1.98	
	W. Workshops	Seven Wells	1890	12	80	60	11.1.98	Furnace of boiler = 60 lb only.
	Kincatachellum	Poonamalle Road	1897	12	90	90	20.1.98	
	Madras Club	Madras Club	1897	20	100	100	9.2.98	
	ers & Binny & Co.	Perambore	1882	50	150	65	12.2.98	Both furnaces & bottom shells patched; reduction of pressure owing to deterioration of furnaces.
	adras Municipality	Mylapore	1896	6	120	120	14.2.98	
	rs & Binny & Co.	Perambore	1882	50	150	65	14.2.98	Furnaces patched & strengthening rings added, shells patched. Reduction of pressure owing to deterioration of furnace.

137 " "

& Sons

125	Messrs. Massey & Co.	Cochrane Basin Road	–	8	80	80	17.2.98		
126	" C. Balakistna Moodelly & Co.	Tiruvattur High Road	about 1869	13	40	40	19.2.98		
127	——do——	——do——	–	16	80	45	19.2.98	Rectangular bars removed & scale cleaned from fire box crown plate & bars replaced	
128	The Southern India Spinning & Weaving Co.	Rayapuram	1896	50	145	145	24.2.98		
129	Messrs. Binny & Co.	Perambore	1891	50	150	150	8.3.98		
130	——do——	——do——	1893	55	175	175	8.3.98		
131	——do——	——do——	1892	55	125	125	8.3.98		
132	Madras Club	Madras Club	1897	20	100	100	8.3.98		
133	Messrs. W. Coleridge & Co.	Tyasarpady	1895	16	80	50	9.3.98	Rectangular bars = 50 lbs per □"	
134	Lawrence Asylum Press	Mount Road	–	12	80	80	9.3.98		
135	Messrs. Deschamps & Co.	——do——	–	15	80	75	9.3.98	Pressure reduced owing to wear & tear of furnace.	
136	" Best & Co.	1st line beach	1895	10	80	80	12.3.98		
137	" C. Gopal Rayagar & Sons	Cochrane Basin Road	–	6	35	35	12.3.98		

138	Messrs. Binny & Co.	Perambore		1891	50	150	150	12.3.98	
139	" Best & Co.	Rayapuram		1895	10	70	70	23.3.98	

Office of the Inspector of
Steam-boilers & Prime-movers
Fort St. George, 27th May 1898

W. T. Walters
Inspector of Steam-boilers & Prime-movers.

Statement B

Statement of boilers for which licenses were refused & are not as yet repaired.
those that were condemned outright are marked thus x.

Number.	Owners.	Description.	Reasons for refusing license.
1 x	Messrs. Simpson & Co.	Portable multitubular	The shell was found nearly worn through on bottom half, smoke box tube plate worn through, steam was virtually held in boilers by corrosion that covered the defect on bottom portion; the remaining portion of the tube plate was grooved badly ~~badly~~, likewise furnace end plate was grooved $\frac{1}{8}$" deep. Combustion chamber pitted

					pitted in several places $\frac{1}{16}$" deep & 4 rivet collars cracked.
2	X	Harbours Trust Board	Vertical tubular		Fire box badly grooved all round bottom, the plate was reduced from $\frac{5}{16}$" down to $\frac{3}{32}$" = which = 15 lbs pressure.
3	4	——— do ———	Cornish		It was found on survey that the furnaces would sustain 21·5 lbs only owing to the furnaces being without strengthening rings.
5		——— do ———	Vertical cross water tubular		Uptake was found cracked through nearly all round top flange.
6	X	——— do ———	Locomotive		Boiler barrel, tubes, roof bars & crown of fire box scaled thickly; boiler barrel in a state of corrosion. Fire box iron casing bottom back corners worn out, mud

			mud plugs & hole threads in bad condition waterways & stays (24) broken. Fire box tube plate bulged, sides & back plate bulged badly. Smoke box tube plate worn out on bottom portion.
7 ×	Harbours Trust Board	Locomotive	General condition very defective. and the boiler is very old.
8	Messrs. W. E. Smith & Co.	Vertical tubular	All the tubes require re-expanding, waterways cleaning, additional safety valve 2" diameter fitting & 1 steam stop valve fitting directly on to shell of boiler
9	Messrs. Arbuthnot & Co.	Cornish	Shell on right side badly bulged inwards.
10	× Public Works Workshops	Vertical cross water tubular	Condition in all parts bad.
11	Southern India Spinning & Weaving Co.	Fairbairns patent tubular	End plates & angles cracked in several places, furnaces bulged down in 4 places 1/4 inch & much reduced by corrosion.

12	×	School of Arts	Vertical tubular		General condition very defective.
13		Messers. Binny & Co.	——do——		Condition in all parts very defective
14		——do——	Fairbairns patent tubular		Circumferential seams patched, all patches in bad repair; both furnaces of the Adamson's anti collapsible type were found entirely worn out.
15	×	——do——	——do——		Shells were patched at circumferential seams, but in bad repair; furnaces were found reduced from ½" down to 5/16"; in this case the material was found to be very brittle in shell, it followed that repairs were useless.
16		Public Works Workshops	Portable multitubular		Waterways & crown of fire box completely chocked with scale, crown of fire box requires renewal,

longitu-

				longitudinal stays, and collector seating on bottom of shell, complete set of tubes, all waterway stays & crown stays require renewal; and back covering plate of fire box patching.
17	Public Works	Workshops	Portable-multitubular	Both side plates of fire box and all tubes require renewal.

Office of Inspector of Steam-boilers & Prime-movers,
Fort St. George, 27th May 1898

D. T. Walters
Inspector of Steam boilers & Prime-movers

Enclosure to letter No. 1013 dated 1898

Public Works DEPARTMENT.

11-

Papers to be read in Proceedings:—

Report of the Inspector of Steam-boilers and Prime-movers

Again G.O., dated 189 , No.

Again G.O., dated 189 , No.

Current No. of 1898, dated 31st May , from the Sanitary Engineer to Government.

" " " 189 , " , "

" " " 189 , " , "

ORDER.

His Excellency the Governor

No 1741 W dy 8-7-98

Ordered to be published in the Fort St. George Gazette for general information.

2. His Excellency the Governor in Council is of opinion that much useful work has been done during the period under review and that private owners of boilers as well as the public --- generally may be expected to derive advantage from the suggestions made and precautions taken by the Inspector to ensure the economical and safe --- working of Steam Boilers and Prime Movers in the city of Madras.

3. The periodical survey of the --- engines, boilers and pumps belonging to Mofussil Municipalities is also --- likely to prove of the greatest utility, and Municipal Councils should be instructed to give effect, as far as practicable, to the Inspector's recommendations in regard to the repair and

Print without the Appendices to the Report

Short proc

The Report, which is interesting, should be furnished, but without the appendices.

D.H 4.7.98

(1) JSSae as amended - & then (2) I.O. for reply & reference made

Sanl. Engr. 5 July 98

[P. W. 4. 500—24-3-98.]

055.3 / 5869/98

and economical working of machinery.

4. The question of giving effect to Section 14 of Act III of 1893 in regard to certificates of competency (~~has already engaged the attention of Government, and it has been decided that no action shall be taken at present. Vide para 5 of G.O. 174 Judicial dated 25th January 1895~~) will be considered hereafter.

R.S.

Abell 23.6.98

Note If it be decided to publish the report, it is thought that the appendices should be printed. Owners might object to the condition of their machinery being published. The value of the property might thus be depreciated.

As regards para 4 of the draft order, ~~it would perhaps be well to maintain the status quo to in 1895. It is not likely that the class of men generally employed would be able to pass examinations of any kind. They would all pass as a rule.~~

R.S.

* It should be impossible for a driver to light a fire in a boiler-less boiler!

Abell 23.6.98

Yes. A.S.H.

It would be impracticable to do this at present. It would be difficult to find enough competent men, and the requirement would result in an increase of wages.

Mr. De Winton should say how he would propose to institute the examinations necessary for such a test; i.e., whom he would appoint as examiners and what degree of proficiency he would require. When all this has been settled, it might be advisable, for the first year or two, to make the examination permissive. Later on, it might be made compulsory. Employers would probably prefer men who possessed the proper certificate. In this way, men would be induced, without compulsion, to submit to the examination. A.S.H. 4.7.98

I think it is quite time some test of competency for managing boilers was imposed. The need of be a simple examination in practical details, the demands to be drawn up by the Insp. of Steam Boilers, & made applicable to future appointments.

The Superintendent, Govt. Press.
" Sanitary Engineer.
" Local & Municipal Department.

23/6/98

RATES OF CHARGE FOR INLAND TELEGRAMS.

The address (including name of Sender, and name and residence of Addressee) is transmitted free.

	First 8 words.	Each additional word.
Deferred Message	... 8 Annas	... 1 Anna.
Ordinary "	... 1 Rupee	... 2 Annas.
Urgent "	... 2 Rupees	... 4 Annas.

A group of 3, or less figures, is reckoned as one word.

No charge for delivery within a distance of 5 Miles.

further papers will probably be found with G.O. 2242W which was sent to R. 21.8.01 & H.C. on 22.8.01 & await reply from Bombay Govt. Pwn 29.8.01

Ex 1741W 8.7.98 telegram + letter cre 6871 cre 6000