

T H E S I S

SUGGESTED MODEL BOILER LAW FOR THE

STATE OF TENNESSEE

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There may be some phase of the subject overlooked or intentionally omitted in this thesis, but it is the writer's opinion that the important questions are here treated and anything omitted will through necessity present itself.

Some opposition may be expected from manufacturers, operators, owners, unions and insurance companies.

The manufacturers insist, and they should, that the administration be carried on by men qualified for such responsibility. They are not interested so much as to who does the work but insist that they have sufficient training to enable them to handle that job. The man who does not know enough to be a designer would be at a loss to know when a boiler is correctly designed. Hence, it is necessary that an inspector must have a sufficient training in design that he may pass judgment on a design and on the building of such design. If such men as these are given the administration of the rules, little opposition will be had from the manufacturers.

The operators are the men who are most apt to be imposed upon. In their case, they are out of the use of their boiler while inspection is taking place, and it is they who pay the inspection fees. However, it is they whom the law is attempting to protect. To protect their lives and the lives of their men as well as their property is its object. If the inspection be made at such time causing the least loss in time with sufficient notice being given of the time of inspection, with every effort being made to cause as little loss as possible, their support may be expected.

The union will have little objection, as they realize that it is to their interest and protection to have such inspection.

The insurance companies have inspectors who inspect boilers. The writer is recommending that the state accept this inspection. Duplicate inspection would work an added hardship on the operator and he would be slow to insure. If, on the other hand the inspection made by the insurance company inspector be accepted by the state, the fee would be saved for the operator and he would prefer insurance. Then it is only necessary to accept their inspection to have the support of insurance companies.

This thesis is being prepared with the expressed aim of stimulating thought to action. The author is interested in securing proper supervision of the use of all boilers in the state of Tennessee.

At the outset we recognize the problem confronting those who may attempt to arrange a set of necessary rules and regulations to govern such a system of supervision. Hence, if the contents of this should suggest as much as two or three points that may be instrumental in securing the adoption of such a system, or that it may be of some influence toward increasing its practical value to the people and state, it will then have accomplished its purpose and the effort will not have been in vain.

After a survey of the opinions of men connected with such a system in other states, we are unable to find a single opposing opinion. All men written to on this question were enthusiastic over the success of the efforts given on this in their respective states.

For some time it has been the desire of those interested in Tennessee to secure boiler code legislation. In fact there has already been such a bill before the Legislature. The failure of the bill proposed was not due to the opposition to the main content, but only to some minor provisions of the bill.

The purpose of the creation of a Boiler Inspection Division of the Department of Labor of Tennessee is to promote greater safety for those whose duties make it necessary for them to be near boilers that are under steam pressure; those who for any reason may be near such boilers; and the property incident to the use of such boilers.

This is to be brought about by the elimination of boilers liable to explosion and the repairing of defects calculated to cause explosion.

Then the object back of such action is to promote safe and efficient steam boiler practice, thereby insuring better protection to life and property. To this end we invite the co-operation of boiler builders, operators, engineers, inspectors, and insurance companies.

This thesis is designed as a discussion of a model bill in view of the fact that others are working on such a bill. It is thought that this may be of some value to those who are so interested. It is to be considered as a reference on the subject of boiler legislation.

Many letters have been sent out to different parts of the United States as well as to the State of Tennessee. It was the hope of the writer that in so doing he might ascertain what objections, if any, had been experienced by other states. This survey revealed little or no objections, but introduced many points of encouragement.

SUGGESTED MODEL BOILER BILL FOR THE STATE OF TENNESSEE

Section 1. Be it enacted by the General Assembly of the State of Tennessee that within sixty (60) days after the passage of this act and at any time thereafter that the office may become vacant, the Commissioner of Labor shall appoint, and may remove for just cause, when so appointed, a citizen of this state who shall have had at the time of such appointment not less than (-) years' practical experience with steam boilers, to be chief inspector of the Boiler Inspection Department of the Bureau of Labor, for a term of () years, and until his successor shall have been appointed, at an annual salary of () dollars.

The said Chief Inspector is hereby authorized and empowered, subject to the approval of the Commissioner of Labor, to employ two deputy inspectors of boilers, who shall have passed a written examination as to their knowledge of the construction, installation, maintenance and repair of steam boilers and their appurtenances, at annual salaries not to exceed () dollars each and to employ one clerk who shall act as stenographer and bookkeeper for the Boiler Inspection Department, at a salary of not more than () dollars per annum.

The Chief Inspector of the Boiler Inspection Department shall furnish a bond in the sum of () dollars and each of the deputy inspectors shall furnish a bond in the sum of () dollars, conditioned upon the faithful performance of their duties and upon a true account of all money handled by them respectively and the payment thereof to the proper recipient; and said bond to be approved by the Attorney General and deposited with the Secretary of State. The Chief Inspector, with the deputy inspectors and clerk herein provided for shall constitute the Boiler Inspection Department of the Bureau of Labor. The salaries of the Chief Inspectors, the deputy inspectors and the clerk, together with the necessary expenses of the Boiler Inspection Department, shall be paid out of the fees, for which provision is hereinafter made.

Section 2. Be it further enacted that the Chief Inspector of the Boiler Inspection Department, either personally or by the deputy inspectors of the department, shall carefully inspect internally and externally, once annually, every steam boiler and steam generating apparatus located in the State of Tennessee which is not excepted from such inspection by the provisions of this act, and shall give the owner or operator of each such boiler at least five days notice of the time when such inspection will be made. Provided, that boilers in ice factories shall be inspected when not in operation for the manufacture of ice and similarly with boilers of other industries, choosing the time of inspection that will cause the least idle time of the boilers while inspection is being made. The Chief Inspector shall have free access at all reasonable times for himself and his deputies to any premises in this State where a boiler or power plant apparatus is being installed or operated, for the purpose of ascertaining whether such boiler or apparatus

is built, installed and operated in accordance with the provisions of this act.

The Chief Inspector shall enforce the laws of the State governing the use of steam boilers. He shall examine into and report to the Commissioner of Labor the cause of steam boiler explosions which occur in the State. He shall keep in his office a complete and accurate record of the names of all owners or operators of steam boilers inspected by his department, together with the location, make, type dimensions, age, condition, pressure allowed upon and date of last inspection of such boilers and he shall make an annual report thereon to the Commissioner of Labor.

Section 3. Be it further enacted, that boiler inspectors employed by insurance companies which are authorized to insure boilers in this State shall hold certificates of competency issued by the State Boiler Inspection Department, as hereinafter provided, and shall inspect all boilers insured by their respective companies. Such insured boilers shall be exempt from all inspection other than that of the respective insurance companies' inspectors. Each such insurance company shall within thirty (30) days following each inspection made by its inspector, file a copy of its inspection report and date of such inspection with the Boiler Inspection Department on forms to be approved by said department and shall report to said department the location of all boilers on which insurance has been refused or cancelled because of existing dangerous defects, together with the names of the owner or user of such boilers.

Section 4. Be it further enacted, that upon receipt by the Boiler Inspection Department of a report of each annual inspection from a state inspector or from an inspector employed by an insurance company that a boiler is in safe working condition, with the fittings necessary to safety properly adjusted, the Commissioner of Labor shall issue to the owner or user of such boiler, upon the payment of a fee of one (1.00) dollar, a certificate of inspection which shall state the maximum pressure at which the boiler may be operated as may be determined by the rules adopted by the Boiler Inspection Department, as hereinafter provided, and thereupon such owner or user may operate the boilers described in the certificate for the remainder of the State's fiscal year and until another inspection is made, unless it shall be sooner withdrawn.

Section 5. Be it further enacted, that any owner or operator of a steam boiler who is dissatisfied with the results of an inspection made by an inspector employed by an insurance company may appeal to the Chief Inspector of the Boiler Inspection Department who shall cause a special inspection to be conducted and upon the report of such inspection shall render his decision, such decision to be final.

Section 6. Be it further enacted, that certificates of competency and commissions as inspectors of steam boilers shall be issued by the Boiler Inspection Department to persons in the employ of any company authorized to insure boilers against explosions in this State, provided that such persons employed as inspectors pass a written examination as to their knowledge of the construction, installation, maintenance and repair of steam boilers and their appurtenances. Said examination shall be confined to questions, the answers to which will aid in determining the fitness and competency of the applicant for the intended service and shall be of uniform grade throughout the State.

For each certificate of competency and commission as inspector of steam boilers issued under the provisions of this act, a fee of () dollars shall be charged to the person to whom the certificate and commission is issued. Any commission issued under the provisions of this act shall be immediately returned to the Boiler Inspection Department when the inspector to whom it has been issued shall cease to be employed by the insurance company employing him at the time said commission was issued. If a person holding a commission as an inspector shall be employed by any other insurance company than the one by which he was employed at the time the commission was issued, a duplicate commission may be issued upon the payment of a fee of one (\$1.00) dollar. Certificate of competency and commissions issued to boiler inspectors may be revoked upon notice to the holder thereof and to the employer of such inspector for (1) incompetency or untrustworthiness, or (2) for willful falsification of any matter or statement contained in his application or any report of any inspection; but the holder of such certificate shall be entitled to a hearing before the Boiler Inspection Department to show cause why such certificate shall not be revoked.

Section 7. Be it further enacted, that every manufacturer, owner or user of a steam boiler or boilers in use or to be used in any part of the State and subject to inspection by the Boiler Inspection Department, as provided by this act, shall report to the said department the location of such steam boiler or boilers within sixty (60) days after the passage of this act, and thereafter, at such time and in such manner and form as may be determined by the rules and regulations of said department. Such steam boilers may be tested by hydrostatic pressure, one-quarter greater than the ordinary working steam pressure used, when in the judgment of the inspector such a test is necessary to ascertain the true condition of the boiler. All boilers to be tested by hydrostatic pressure shall be filled with water by the owner or user and pumps shall be furnished by the inspector if necessary. Any inspector of the Boiler Inspection Department or any commissioned inspector of an insurance company, who, after inspection of a steam boiler, shall find it unsafe for operation, shall suspend its certificate of inspection and forbid its further use until it shall have been made to conform by the Boiler Inspection Department and until its certificate of inspection shall have been reinstated by an authorized inspector.

Section 8. Be it further enacted, that no owner or user of a steam boiler, or engineer or fireman in charge of it shall operate or allow it to be operated without a certificate of inspection issued by the Commissioner of Labor, or shall allow a greater pressure in it than is allowed by the said certificate of inspection.

All boilers used for generating steam or heat in this state, hereafter purchased, shall be constructed, installed and operated in accordance with the A. S. M. E. Boiler Code and with the rules and regulations set forth in this act.

Section 9. Be it further enacted, that there shall be paid for the annual inspection of each boiler by the Boiler Inspection Department made according to the provisions of this act, the sum of () dollars where there is only one boiler in a plant, but where there are two or more boilers in a plant there shall be paid the sum of () dollars for the first boiler and the sum of () dollars for each additional boiler.

Section 10. Be it further enacted, that any inspector of steam boilers who shall report a steam boiler for a certificate of inspection as safe to operate while knowing such report to be false and that said boiler is unsafe to operate, or who shall fail to perform his duties as herein stated, shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to exceed () dollars, or by imprisonment not to exceed () 0 years or both.

Section 11. Be it further enacted, that all money received under the provisions of this act shall be paid to the State Treasurer, who shall place same to the credit of the General Revenue Fund, and the salaries and expenses of operating the Boiler Inspection Department shall be paid therefrom. The Commissioner of Labor is authorized to issue vouchers for salaries and expenses of the boiler inspection department, when proper appropriation has been made for such expenditures.

Section 12. Be it further enacted, that the provisions of this act shall not apply to boilers in marine or railroad service which are under the inspection regulations of the United States Government; or to boilers of steam fire engines brought into the state for temporary use in time of emergency to check conflagrations; or to portable boilers used for agricultural purposes; or to heating boilers carrying less than fifteen (15) pounds pressure per square inch.

Section 13. Be it further enacted, that all laws and parts of laws in conflict herewith are hereby repealed, and this act shall take effect and be in force from and after its passage, the public safety requiring it.

In conclusion, it may be stated that the only thing needed in support of such a bill for the State of Tennessee is that the existing desire be stimulated to action. Most of the parties interested in boilers are enthusiastically supporting the effort being given to this subject and all are very reasonable in conceptions as to what they consider a practical law.

Therefore, in conclusion the writer recommends the above bill as a model for the conditions as found in his study of the situation.

BIBLIOGRAPHY.

1. Low Pressure Heating Boilers, Ohio - Rules
2. Bureau of Boiler Inspection, Oklahoma - Rules and Regulations
3. Steam Boiler Inspection - New Jersey.
4. Boiler Safety Orders, California 1915.
5. Boiler Bulletin, Arkansas.
6. Ohio Boiler Inspection Law 1925.
7. Boiler Laws of Indiana 1923.
8. Standard Boiler Code, New Jersey.
9. Labor laws, Pennsylvania 1925.

APPROVAL SHEET.

The foregoing thesis is hereby approved as a creditable study of an engineering subject, carried out and presented in a manner sufficiently satisfactory to warrant its acceptance as a pre-requisite to the degree for which it has been submitted.

It is to be understood that by this approval the undersigned does not necessarily endorse or approve any statement made, opinion expressed, or conclusions drawn therein, but approves the thesis only for the purpose for which it is submitted.

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