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FIRE PROTECTION HISTORY-PART 171: 1921 (A BRIEF HISTORY OF SPRINKLER SYSTEM WATER SUPPLY ISSUES)

By Richard Schulte

Concerns about supplying sprinkler systems from municipal water distribution systems have been around for a long time. The following is the transcript of the Report of Committee on Private Fire Supplies from Public Mains addressing the history of the issues surrounding sprinkler system water supplies from municipal systems presented at the twenty-fifth Annual Meeting of the National Fire Protection Association held in San Francisco in 1921:

"*The Secretary: Mr. Chairman, we have as the next item on the program, the report of the Committee on Private Fire Supplies from Public Mains.*

Report of Committee on Private Fire Supplies from Public Mains.

E. V. French, Chairman,

A. T. Bell, Geo. W. Booth, H. A. Burnham, Ira G. Hoagland, H. B. Machen, Thos. McCaughern, R. H. Morris, Benjamin Richards, H. P. Smith.

The work of this Committee began more than a dozen years ago. It was somewhat interrupted during the war period so that it is now believed that a brief review of the past twelve years will be of interest and value.

Review.

In 1909-10 the subject of automatic sprinkler protection and the size and arrangement of sprinkler connections from public mains was presented and discussed, the matter of accessibility of the controlling valves was also considered in its bearing on possible bleeding of the public water system and a set of rules was drawn up summarizing the conclusions from these discussions.

In 1910 there were also presented details of an approved method then just being developed for safeguarding water systems from the effect of reverse flow from secondary private supplies of unapproved quality by the use of two check valves of special construction with special arrangement to insure accessibility and periodical inspection.

During several years following, two other principal topics have been brought up: namely, in 1915-16 the matter of utilizing "high pressure systems," so called, as a supply for automatic sprinklers, was taken up in co-operation with the special committee on that subject; and in 1917 the matter of fair adjustments of rates charged for private fire protection was introduced.

Over this entire period there is noticeable a good spirit of co-operation among all who contribute to the increased efficiency of fire protection.

Double Check Valves.

Perhaps the most important development under the scope of the committee work is the continued excellent record of the double check valve equipment above mentioned and described in the National Fire Protection Association proceedings of 1910. Over 500 such equipments are now in actual service in various parts of the country. These are periodically inspected internally and tested for tightness and as far as is known no case of trouble in public water mains from leakage of these equipments has yet occurred. Information regarding this safeguard has been welcomed by many Water Works and Health officials as the best solution available for problems in which the conservation of both life and property must be recognized.

Separation of Industrial from Fire Service and Detection of Waste.

Incidental to the development of the double check valve equipment there has also developed the need and practice of more complete separation of the private pipe systems within the property so there would be no use of water through a fire service connection except for the purpose of extinguishing fire or for testing. This desirable separation of fire use from industrial use is also tending to simplify the detection of waste or wrong usage of water through the private fire service.

There is still need of further study in the matter of this kind of waste from strictly fire systems and it is hoped some simple device will yet be produced which will give a reasonably accurate record of what happens in a fire system without the heavy expense of the large and somewhat elaborate measuring devices which in many of the simpler cases tend unnecessarily to discourage the extension of automatic sprinkler protection.

Operation of Controlling Gates.

There have been no developments to show the need of any material changes in the rules for size and arrangement of the fire service connection as outlined in the 1910 proceedings. The importance of the matter of accessibility of the controlling valves can, however, properly be emphasized repeatedly.

To insure the intelligent operation of the controlling valves at the proper time it is not only necessary to have them accessible or controllable under any conditions of fire in the territory they protect but there is need of knowledge on the part of responsible men of the water and fire department as to what the sprinkler system can do.

The danger of unnecessarily bleeding the public mains will be greatly reduced by the co-operation of the water and fire departments in a careful study of the location of the sprinklered buildings in relation to the controlling valves on all pipes whether for fire service or industrial service, this study to be made with special reference to the construction features of the localities protected. With the knowledge gained by such study a small squad of men who would go to every fire would be able to prevent all unnecessary waste of water.

Charges for Private Fire Service.

In the matter of charges for private fire protection service there is still much diversity of practice and as yet no general agreement on the fundamental principles involved.

The full value of automatic fire equipment has not thus far been sufficiently recognized by municipal or other official bodies in its effect on fire prevention. In consequence private fire service connections are usually placed in the same class as industrial and manufacturing services and the benefits are thus ignored which a community receives in its protection against greater loss of industry and possible loss of life which would surely follow the removal of all automatic sprinkler systems.

It has been amply demonstrated in the large manufacturing and mercantile plants of the country that these beneficial effects do exist and therefore it is only fair that their existence be taken into account in determining any charge for the private fire service connection even if the intention of this connection has been merely to protect privately owned property.

It is a hopeful sign that in recent years some public utilities commissions which have been asked for a ruling in this matter have largely held to the principles that any charge for the private fire service should be based on the cost of the service and that the charge should be borne by all who benefit from the service.

There are yet some marked differences of opinion as to the true basis upon which any charges for private fire service should be made. It is now desirable that these different views as expressed by public officials, water works men and fire protection engineers should be reviewed further and analyzed with care to the end that the general position which is fair to all interests may be brought out clearly. The time is approaching when this can be done and it will mean a distinct step in establishing a uniform practice which can be applied to practically all cases.

Members of the Committee have kept in touch with the water works associations in connection with all of these matters and this, with the discussions which come up at the various meetings of these associations, is all helping toward a better understanding of the whole problem and a better appreciation of the fact that our interests are identical and that the best results can be obtained by working in full co-operation. It is believed that the work should be continued along these lines and that we shall in due time reach satisfactory agreement on all points and establish standard practices which will be of benefit to all interests.

Automatic Sprinkler Connections to High Pressure Fire Systems.

The round table discussion in 1915 following the report of Committee on High Pressure Fire Service Systems (which committee was later consolidated with the Committee on Private Fire Supplies from Public Mains) brought out some pertinent points regarding difficulties which might be encountered in using special or high pressure fire systems to supply automatic sprinkler equipments.

In the belief that such use of these special systems would contribute materially to the value of these systems and that anticipated difficulties could be overcome, this Association by vote went on record as favoring such connections and meanwhile "to watch developments and to work out the necessary details."

Among the many points brought out in the discussion were three of outstanding importance, namely:

1. Need of controlling flow in case of excessive waste or breakage of pipes.
2. Detection and control of waste or theft of water.
3. Possible bursting of sprinkler pipes due to high pressures.

The first two points are the same as have been discussed with reference to public systems of moderate pressure and the solution of these problems for both high and moderate pressures will naturally develop along parallel lines. With reference to the third point mentioned, there is need of continued study of practices prevailing with the high pressure systems now in use.

The working out of details for these connections will involve special consideration of the physical effect of continued or intermittent high pressures on sprinkler heads and pipes. There is only a comparatively small amount of data on this point, but such as is available is encouraging. Several manufacturing plants exist where a pressure of 175 to 200 lbs. has been maintained continuously for ten years or more, without trouble, and excepting for the usual providing of sufficient mechanical strength for all materials entering into the equipment, the experience from these high pressure sprinkler equipments does not indicate the need of precautions other than are usually taken with sprinkler equipments under more moderate pressures.

Lacking actual field data for higher ranges of pressure than this (about 200 lbs.), the need of pressure regulating valves and relief valves, the determination of limits for pressure at which these devices should be used, and the types of controlling gates must all have careful consideration.

The outline contributed by Mr. R. H. Morris at the above mentioned discussion contains many topics bearing on this general question, and it is hoped that a careful consideration of these topics may soon lead to a workable set of regulations governing the use of high pressure fire systems as automatic sprinkler supplies.

Discussion.

Mr. Hoagland: Speaking as a member of this Committee, I would like to state that there is an increasing tendency on the part of public utilities to require the general installation of costly apparatus in the way of private fire service connections to public mains. It would seem to me that this is something to which this Association needs to give especial attention, because it is going to have a great tendency to discourage the extension of private fire fighting apparatus.

The Secretary: Is the member making a recommendation for the consideration of his own Committee?

Mr. Hoagland: For the consideration of this meeting.

The Secretary: Has his Committee declined to consider it.

Mr. Hoagland: In view of the rapid increase in such demands, of which the Association may not be cognizant, I am merely offering an opinion."

The sprinkler system water supply issues discussed above sound quite familiar with similar discussions still taking place even today in some localities within the United States.

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