SCHULTE & ASSOCIATES
Building Code Consultants
3500 Creighton Road, K5
Pensacola, FL 32504
fpeschulte@aol.com
847.312.7617

FIRE PROTECTION HISTORY-PART 183: 1916 (SPRINKLER PROTECTION AND LIFE SAFETY)

By Richard Schulte

The case for the use of sprinkler protection to protect the building occupants from fire was eloquently made at the twentieth Annual Meeting of the National Fire Protection Association held in 1916. The following is an excerpt of the Report of Committee on Safety to Life made at this meeting:

"*The President: The next order of business is the report of the Committee on Safety to Life, Mr. H. W. Forster, Chairman.*

[TEXT OMITTED]

SPRINKLERS AS LIFE SAVERS

At the May, 1914 meeting of this Association, your committee presented a report in which a section bore and in which the available data up to that time on life loss in sprinklered buildings was covered.

The report indicated that loss of life in sprinklered buildings had been primarily due to the following:

1. Persons killed by an explosion or burned to death by a fire of limited extent which usually set fire to their clothing.

2. Persons entering a burning building to rescue some article.

3. Firemen killed in the performance of their regular duties.

The accidents of which the committee had definite record indicated five lives lost due to the first cause, and four each due to the other two, making a total of 13.

Since that time, the N. F. P. A. has been making a special effort to gather data of this kind, and the Quarterlies to date have reports on the following:

S-15362. *Slight explosion in gauze room in plant handling mixed cotton and wool stock blew open door, ignited clothing of two men, who were fatally burned. Fire controlled by eight sprinklers and property damage slight.*

S-16198. *An operator working at switchboard had bucket of paint ignited by short circuit, had clothes ignited fell from ladder, rushed from building with clothes on fire, and died of injuries. One sprinkler head opened and completely extinguished the fire.*

S-16846. *Mixing machine room handling dried broken nitrated cotton and camphor and alcohol was scene of fire. Some 376 pounds of dried pyroxylin and perhaps eight or nine gallons of wood alcohol were involved. Cause of fire not ascertained. Three men who worked in room were either suffocated or burned to death. Two other employees near dry room were also fatally burned. The stock in three mixing machines, which were in operation, and therefore closed up, did not ignite. The prompt operation of eleven sprinklers in the room practically extinguished the fire and prevented any considerable less in the building. Twenty-four heads out of thirty-one in adjoining and communicating grinding room also opened and prevented spread of fire in that direction.*

S-16713. *Singeing machine in mercerizing buildings two stories high was located in second story. The structure was brick, concrete, and plank and timber. On a test run and owing to mishandling, gas flame ignited cloth, which men attempted to extinguish with pails of water. Fire gained, rapidly, and as men retreated they reported that sprinklers operated and water was being delivered from them.*

Fire travelling through a wooden chute, connecting the singeing machine with the mercemizing machine of the floor below, swept upward with great force, spread across second floor ceiling, and heat which spread in room owing to windows being open for ventilating purposes, resulted in opening some 318 sprinklers. The head above the top of the chute was prevented almost entirely from distributing water, because of timber which had been used for shafting and rail over which cloth passed. Fire was finally extinguished by hose streams. Of two men working at the singeing machine at the top of the fire, one was overcome by smoke and suffocated.

S-17329. *Explosion in small building used for waterproofing material consisting of rosin, benzol, and alcohol, burned a boy so badly that he died, wrecked the sprinkler system, and necessitated extinguishing the fire by means of four hose lines.*

S-17907. *One story, building used for dehydrating nitrated cotton suffered violent explosion, which wrecked the building and sprinkler system and killed one man.*

S-18545. Linseed Oil Mill. *Fire originated in percolator building, two stories and basement, joisted construction, brick walls. This building was equipped with an approved dry pipe sprinkler system. Plant was in full operation when suddenly an explosion from some unknown cause occurred on first floor, which wrecked the roof and carried the debris from same to a considerable distance above. This was followed a few seconds later by violent explosion in center of north side of building. This percolator building contained considerable naphtha and other volatiles. Five men working on the first floor of this building at the time of explosion were found to be missing and the body of one man had been recovered at the time report was written. Five men working in the basement were badly injured, one having died since.*

S-18807. Dextrine Department of Corn Oil Products Company. *Fire was caused by an explosion in the dextrine dust house. Explosion is said to have wrecked sprinkler system so that it was ineffective. Damage from fire was small but the explosion did considerable damage due to its great force. One man was killed and some ten or eleven were badly burned and taken to the hospital.*

S-18808. Manufacturing Shrapnel and High Explosive Shells. *Explosion occurred in varnish room located on fourth floor of east section. Copal varnish was spread on inside of shells in this room, after which they were placed in metal and asbestos gas-fired ovens to dry. Fourteen of these ovens were in the room. It is claimed that gas was turned on in one of these ovens but not lighted. The flames from the other ovens ignited the gas, and a heavy explosion followed. One employee was blown through terra cotta wall and almost instantly killed, while another was severely injured. No fire followed the explosion, and the water was quickly shut off sprinklers.*

S-18042. *This was a four-story brick, open finish, joisted floor factory occupied for oilcloth and linoleum manufacturing. The fire started near the coating room which contained quantities of paint mixture and other highly inflammable materials. Sprinkler system was poorly arranged and not in accordance with the best modern practice. All heads were 286 degree. Oilcloth was hung in festoons and seriously obstructed the water from the sprinklers. The spread of the fire was very rapid and necessitated the turning in of four alarms. During the progress of the fire several firemen were on the roof of a one-story building adjoining the main building when suddenly and without warning over half of the north wall in the main building fell onto the roof burying the firemen under tons of brick. The Battalion Chief and one of the men were killed while some twenty others were injured.*

This fire comes under the heading of unsatisfactory sprinkler fires, the failure of the sprinklers to hold the fire in check being due to high test heads, sub-standard arrangement together with serious obstruction to distribution.

These reports add 21 to the known total of deaths occurring in sprinklered buildings, making a grand total to date of 34.

The additional fires reported herein with the exception of S-18042 fall in the same class with Group 1 above, namely, persons killed by explosion, exceedingly rapid spread of fire, or some comparatively small fire which ignited clothing with resulting fatality. Fire S-18042 comes in Group 3, namely, firemen killed in the performance of their regular duties.

It is only fair to call attention to the fact that there have been a number of instances in which sprinkler tanks have collapsed and caused a great deal of damage. However, with the possible exception of the Herald Building Collapse in Montreal on June 13, 1910, the Association has no record of any fatalities. Several of these tank collapses, as described in various issues of the Quarterly, have caused a complete wrecking of the building and if there had been anyone in it at that time, there would surely have been a loss of life. A complete report of the Herald Building Collapse, which resulted in a loss of 32 lives, was given in the July, 1910 Quarterly. The amount, if any, of the blame which was chargeable to the sprinkler tank could not be determined.

Your Committee does not feel that these additional fires in any way warrant a modification of the committee's formal opinion of two years ago to the effect that "it is today an almost unquestioned fact that the automatic sprinkler affords the largest degree of protection of life against fire in practically all cases where there is combustible construction or material, the rapid burning of which is liable to be a menace to the lives of the occupants of the building."

There have, within the last year, been two factory fire horrors, namely, the Union Paper Box Company of Pittsburgh and the Diamond Candy Company of Brooklyn, in which 13 and 12 lives respectively were lost.

In writing of the Pittsburgh fire, Mr. Lew R. Palmer, Chief Inspector of the Department of Labor and Industry of Pennsylvania, and a member of this Committee, said in part:

> *"Had either the Pittsburgh or Brooklyn buildings been equipped with sprinklers, I believe the fire would have either been put out, or at least retarded to allow the operators to have escaped.*

Had the owner of the building protected the workers against the risk internal to the building, the same as he had protected them against the risk external to the building, that is, installation of wired glass down the front of his building in the area surrounding the external fire escape, the same as had been installed in the windows opening to the side walls of the building, I believe no lives would have been lost. Samples of the wired glass in these side windows, which withstood the heat for more than an hour, are the basis of the above opinion."

From such knowledge of these fires as your committee has, it agrees entirely with Mr. Palmer.

Your Committee urges on our membership the preaching of the gospel of sprinklers as life savers.

The Committee presents this section of its report to the Association as a record of recent development. There probably is no need of any action other than to receive and print it in the Proceedings.

Given the above, it is quite interesting that there is any discussion today regarding sprinkler protection and building occupant safety. We've known about the protection provided for building occupants by sprinkler system installations for at least a century.

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Source: "*Proceedings of the Twentieth Annual* [NFPA] *Meeting*", Chicago, Illinois, 1916.