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FIRE PROTECTION HISTORY-PART 114: 1930 ("CLASS B" SPRINKLER EQUIPMENTS-THE DEBATE)

By Richard Schulte

The thirty-fourth Annual Meeting of the National Fire Protection Association was held at (Hotel) Haddon Hall in Atlantic City, New Jersey in May 1930. Among the technical committees with reports at this meeting was the Committee on Automatic Sprinklers. The Committee proposed that rules for Class B (light hazard) sprinkler equipments be approved. The following is the discussion of the proposed rules for Class B sprinkler equipments:

"***Discussion. Division I.***

Mr. Boone: In presenting the report of the Automatic Sprinkler Committee, I wish to say a few words with reference to the proposed regulations for Class B standard systems[.]

The impression seems to have been gained by some of our members that the committee in this standard is breaking down the installation regulations that have proved entirely satisfactory and that, therefore, there should be no need for Class B or modified regulations. With all due respect to those who feel we are likely to take a wrong step, I wish to point out there is a growing need for the Class B regulations–a genuine demand of long standing for automatic sprinkler protection in light hazard occupancies, such as listed. To install sprinklers in accordance with the present regulations in these classes is positively prohibitive today because of the cost.

We are all familiar with the automatic sprinkler. We know what it is capable of under most adverse conditions. It stands today without a peer as a fire protection device; and as sprinkler protection is much needed in certain classes of occupancies, such as hospitals, hotels and institutions, it was up to this committee to prepare, and is for the Association to adopt a set of regulations that will encourage the installation of sprinklers in these classes.

The proposed regulations for the Class B system have been prepared after careful study and thorough tests by Underwriters' Laboratories. In addition, we have the country-wide experience over a period of thirty years with the performance of the automatic sprinkler under actual fire service. The record is phenomenal. It has proved its reliability in coping with fire under the most trying conditions. Actual failures have been few and far between. Many of these equipments were installed under regulations existing twenty or more years ago and are still giving good service. As the years have rolled by we have continued to refine our regulations until they have reached the point where they may be considered almost perfect, resulting in the installation of the "superfine" variety with all the trimmings and at very great cost.

Under the existing conditions today there seems to be no reason for requiring these "superfine" installations as to pipe sizes, spacing and water supply in the class of occupancies listed as acceptable for the Class "B" system. There is no leeway in the present regulations, no distinction being made between a sprinkler system for a cotton mill and an office building or a woodworker and an institution. The Class "B" regulations, if approved by the Association, will permit of the installation of positive protection in classes of properties listed, many of which are veritable fire traps where the protection is most needed. If a system of automat|c sprinklers is properly installed in accordance with these regulations, with dependable alarm service and proper maintenance, there need be no fear that the system will break down under the average fire condition, just because the spacing has been stretched and the pipe sizes modified. The sprinkler will do just what it is put in to do–check the fire in its incipiency and give the alarm summoning outside aid.

Mr. E. W. Harrington (Manufacturers Mutual Fire Insurance Company, New York): Is this rule on the spacing of the sprinklers to be printed in the regulations under Rule 223 without any identification as to where the 14-ft. spacing is to apply ? How will this be identified as applying only to the Class "B" system ?

Mr. Boone: It is my understanding that for the time being it is not the intention to incorporate this report in the Sprinkler Regulations; they will be printed separately. Eventually they will be included in the regulations, but without amplification.

Mr. Harrington: Without some amplification, I fear misinterpretation of the 14-foot spacing rule which might result in increasing the standard spacing to 14 feet in all occupancies.

Mr. Boone: I do not see how that is possible if you stick closely to the wording of the report.

Mr. Gorham Dana (Eastern Underwriters' Association, Boston): It seems to me that the trouble is due to the numbering system used[.] *If this could be so changed that there would not be any mixup between the numbering of the items in Class A and in Class B, I think it would clarify the situation; in other words, have a new system of numbering paragraphs, possibly using the present numbers of the old rules in parentheses.*

Mr. Harrington: That seems to me a suggestion that can be worked out to distinguish this from the regular standard and not to disturb the numbering of the regulations.

Managing Director Wentworth: This material on Class B systems is to be printed as a separate booklet, so there should not be confusion.

Mr. I. Osgood (Boston Board of Fire Underwriters): In Section 2, the headings are the same as in the present sprinkler regulations. It seems to me that it would be wise to include here a statement that the definitions of these various types of constructions are those given in the Sprinkler Regulations. In Section 225 we say, "Under open finish, no modification of spacing shall be permitted." That refers back to the standard rules. It seems to me that ought to read "For open finish, no modification of spacing permitted by the standard rules shall be permitted." In other words, this section ought to be tied up with the comparable section in the red book.

Managing Director Wentworth: The committee will be glad to consider that, I am sure, Mr. President

Mr. Harrington: No. 311 says that there is no limit to the number of sprinklers to be supplied by a 2[-]*1/2-inch pipe and the maximum number of sprinkler heads allowed for a two-inch pipe is ten, according to the regular standard schedule. Apparently this matter of pipe sizes takes no account of how large the room is in which the sprinklers are located. I mean a room without any partitions. I am thinking about an attic in a hospital, perhaps fifty by a hundred feet, which would ordinarily take sixty sprinkler heads. Is it the intention of this rule that a 2*[-]*1/2-inch pipe shall be the size of the riser to supply that attic?*

Mr. Boone: Mr. Harrington, I presume, would treat that situation exactly as many of us would; we would have in this blind attic of open joist construction a standard system as to pipe sizes. The rest of the layout through the small rooms or other sections would be in accordance with this new or modified schedule.

Mr. Harrington: I am worried about the risers coming up from the basement.

Mr. Boone: You would select the size of the riser, whether it be three-inch, four-inch or larger, required to supply the number of sprinkler heads in the attic[.]

Mr. Harrington: I did not interpret your rule in that way; there is nothing here that would indicate larger pipe sizes than required for ten heads.

Mr. Boone: The whole matter of the correct interpretation of this Class B standard is left with the inspection department having jurisdiction. They can decide as to the type of property to be equipped with this system, and they can elect to have, if they choose, a standard equipment in one section of the building and modified equipment in another. There is nothing in these rules that prohibits that, and there is nothing that says they must be installed in this, that or another way.

Mr. Dana: I think if Mr. Harrington will read the first part of Section 311, he will find the answer to his question. It says, "No pipe in excess of two and a half inches shall be required inside of buildings where water pressure is sufficient to maintain twenty pounds residual pressure at top of riser, with 250 gals. per minute flowing at top of riser." In other words, if you do not get enough water to comply with that rule, you have got to put in a larger riser.

The President: I think that is also covered in the second paragraph under "Occupancies where Permitted."

Mr. Dana: I think, in order to clarify the matter, where it says "no limit," there ought to be an exception "except as noted (somewhere else)." It is a little misleading as it now stands.

Mr Boone: It is specifically left to the inspection department having jurisdiction to decide as to where these equipments shall be installed and where two and a half inch pipe shall be used.

Mr. Dana: I think we want the rules as clear as possible, and they are not clear today.

Managing Director Wentworth: Would it be satisfactory to change the words "no limit" to "consult the inspection department having jurisdiction" ?

Mr. Boone: The chairman would not undertake to make any change in this printed report without the unanimous consent of the committee, and I would like to see this stand as printed and as approved by the committee.

Mr. F. B. Quackenboss (Western Factory Insurance Association, Chicago): The paragraph under Occupancies Permitted, referred to by our President, clearly covers the situation. "Approval of the use of Class B standard systems must be secured in advance from the inspection department having jurisdiction, since this type of system may not furnish adequate protection for all buildings (or all portions of buildings) housing the listed occupancies." I think that clearly points out that inspection departments having jurisdiction must analyze the individual property and determine in advance the application of these rules. I think it would be unwise and unnecessary to modify the text as printed[.]

Mr. W. D. Grier: (North British and Mercantile Insurance Company, New York): I hesitate to differ with some high authorities who have spoken on this subject and in whom I have the greatest confidence. But I cannot help agreeing with Mr. Dana that there is a possibility here of misunderstandings. "No limit" is pretty strong language. I think there should be attention called to the fact that under certain conditions there may be a limit.

Mr. C. W. Mowry (Associated Factory Mutual Fire Insurance Companies): I cannot refrain from agreeing with the last speaker. I understand that this first note does call attention to the underwriters having jurisdiction studying the matter carefully, but when some people use the pipe schedules hurriedly and see "no limit," there may be a temptation to exceed the safe limit. I move that after the words "no limit," there be added the following: "except that in all areas of open joist construction and in kitchens, storerooms, laundries and similar rooms not of light hazard, the risers shall be of standard size."

Mr. C. B. Langdon (Factory Insurance Association, Hartford): If the last line were left out entirely, would it not leave the thing complete? The first paragraph specifies where larger sized pipes are necessary.

Mr. Osgood: It seems to me that that table might be left as it is, but perhaps, the note under Occupancies where Permitted might more definitely indicate that the matter must be referred to the inspection department[.] *"Approval of the use of Class B standard systems in any building or in any portion of a building must be secured in advance," etc*[.] *That would indicate that the inspection department may allow a Class B system in parts of the building and require a standard system in other parts*[.]

Mr. Boone: It seems to me, in reply to Mr. Osgood, that the present second paragraph takes care of that situation I would so interpret it.

Mr. Osgood: But I do not think it is quite clear. It allows a Class B system in parts of the building and requires a standard system in other parts?

Mr. Boone: It does.

Mr. Osgood: Then why not say so?

Mr. Harrington: Even the standard rules have to be interpreted, and they specify the spacing of the sprinklers and pipe sizes; why can't we do it for this system as well? I like Mr. Mowry's suggestion of specifying that in certain sections standard pipe sizes must be used.

Mr. Benjamin Richards (Underwriters' Service Association, Chicago): When you designate certain occupancies and conditions, you always have a little different occupancy and condition coming up and are in just as much trouble as before. The real thought seems to be that these paragraphs about the underwriters having jurisdiction apply here, so instead of "no limit," why not say "this limit to be set in each case by the inspection department having jurisdiction"? One of the troubles with this whole thing is that it specifies certain occupancies. Of course we all know that there will be a good many occupancies besides those mentioned to which this will be applied. Therefore, I do not see how we will get very far with the amendment that Mr. Mowry proposes, as it is so limited in its scope.

Mr. Dana: It does not seem to me that Mr. Mowry's motion gives us quite what we want, for the reason that the larger pipe sizes specified in 311 do not depend on the occupancy but on the water pressure, and, therefore, I would suggest as a substitute motion, the suggestion of Mr. Langdon, that we simply omit the last line reading "2[-]1/2-inch, no limit." That, I think, will cover the whole question, because the first part of that paragraph tells you that no pipe in excess of two and a half inches shall be required under certain conditions.

Managing Director Wentworth: Does it not seem reasonable to the chairman that it be omitted entirely? Is there any harm in that?

Mr. Boone: I do not see any harm.

Mr. Mowry: Mr. Dana's statement is true as far as the quantity of water is concerned, but I can conceive of a large attic in a dormitory, for example, used for the storage of trunks, where two hundred and fifty gallons a minute would not be an adequate water supply. There may be twenty or thirty heads that would be opened, and, therefore, merely complying with the requirements for water supply would not give us what we desire; we want not only the water supply adequate but the pipe sizes adequate, too.

The President: Mr. Dana, do you care to comment on that?

Mr. Dana: It seems to me that the occupancy portion of the question is included in the preliminary note already mentioned. I do not think it is needed in this particular section.

Mr. Henry Fiske (Grinnell Company, Providence): I think there might be a decided disagreement as to whether anything more than a Class B standard is needed in some of the occupancies mentioned by Mr. Mowry. Also, there may be other conditions we have not mentioned at all where the Class B standards would not be satisfactory. I think it would be a great mistake to attempt in these rules to outline specific conditions where the full standard might be needed. Under these rules, we have left the matter to the inspection department having jurisdiction, which is the only way to do it. There will be all kinds of conditions in properties of this class where the Class B system would not be proper or desirable and where something between the two would be needed. According to Mr. Mowry's motion, we would have to use the full standard equipment under such conditions; that may not be at all necessary; it may be desirable to use something between the two. I cannot see how we can make rules to specify certain conditions, perhaps only a few of those that will come up, and cover this subject.

Managing Director Wentworth. We are feeling our way along in this matter, Mr. President, and it would be desirable to leave the rules as flexible as possible so that they can be applied and tried out.

Mr. George Madison (St. Louis Fire Prevention Bureau): I cannot see any serious objection to the table of pipe sizes presented in this report. We must remember that these regulations are entirely discretionary with the department having jurisdiction. No matter how we put it, it will still remain for such departments to determine how many sprinkler heads would be allowed on a two and a half inch pipe. I believe that the present wording is just as good as any that could be substituted.

Mr. John H. Garland (Improved Risk Mutuals, New York): The argument has been made that when we have an area too large for two and a half inch pipe, we are supposed to use standard piping[.] *That leaves it in doubt. I think the crux of the whole matter is in the expression "no limit."*

Mr. Harrington[:] *Mr. Dana suggested leaving out "2*[-]*1/2-inch, no limit." Why not carry that one step further and leave out all reference to pipe sizes, including the table? Then you will have a rule which does take account of the possibility of long runs of pipe, many angles or unusual areas necessitating a larger pipe than two and a half inches. The present standard rules provide for pipe sizes for the various numbers of heads. Why not omit all this entirely?*

Mr. Boone: I cannot speak for the committee, who studied this question intensely, and I dislike very much to inject my own views. I will say, however, that I think the present text is sufficient to meet all the conditions that we are likely to meet in the field. For the time being it is presumed that each individual case where the Class B standard system is to be considered will be brought to the attention of the inspection department, and it is their privilege, of course, to rule on each and every item, especially the pipe sizes.

The President: Now we have before us Mr. Mowry's motion and Mr. Dana's substitute motion.

Managing Director Wentworth: I do not think it is clear what the substitute is.

Mr. Dana: That the last line of the table be omitted, namely. "2[-]1/2-inch pipe, no limit."

Ms. Osgood: If we eliminate that last line, we might as well eliminate the table, because the rest is the standard pipe table.

Mr. J. H. Norton (Tennessee Inspection Bureau): It occurs to me that this whole problem might be solved by a slight change in the second sentence of the second paragraph of 311, making it read: "With long runs of pipe of many angles or unusual areas or conditions, feed mains and risers above two and a half inches may be required by the inspection department having jurisdiction."

Mr. R. W. Hendricks (Underwriters' Laboratories, Chicago): It seems to me there is already enough reference in this report to the inspection department having jurisdiction. The problem might be solved by saying "ordinarily no limit," if attention were called to the fact that in exceptional cases the matter should be referred to the department having jurisdiction.

The President: We will now vote on Mr. Dana's substitute motion.

(Mr. Dana's substitute motion was lost.)

The President: We will now vote on Mr. Mowry's original motion.

(Mr. Mowry's motion was lost.)

Mr. Charles H. Fischer (New York): Under the paragraph headed "Occupancies where Permitted," there is a statement that approval of Class B systems must be secured in advance from the inspection department, and under Section 3, referring to the number of sprinklers permitted on a two-inch pipe, there is a definite, clear-cut statement that ten heads are allowable. There is no qualification. Inspection departments would not permit eleven or twelve or thirteen heads to go in on a two-inch line. On a two and a half inch line there is an unqualified statement "no limit." I do not see how the inspection department is going to qualify this unless we specify some qualification. I think the Association should guide the inspection bureau in some way.

Managing Director Wentworth: Isn't this all just a matter of interpretation ? I think we have discussed it enough to see that we want a little clearer pronouncement. I move that this item be referred back to the committee for consideration in the light of this discussion. I think they can work out a clear statement that will meet anticipated confusion.

Mr. Quackenboss: The Sprinkler Committee gave deep consideration to the entire subject, thought over it much longer than it has been thought over here, and I do not think anything would be accomplished by referring it back to the committee. They are overwhelmingly in favor of it as it is. I think to refer it back would be only to delay the matter with no results.

The President: Mr. Wentworth's motion is that this be referred back to the Sprinkler Committee.

Managing Director Wentworth: I thought the committee might be willing to suffer a little more. (Laughter.)

Mr. Boone: I do not know how the committee feels, but the chairman does not wish to suffer a little more; I would like to see the report adopted just as it is printed.

The President: We will vote on Mr. Wentworth's motion that this portion of the report be referred back to the committee.

(The motion was defeated.)

Mr. T. Z. Franklin (Automobile Insurance Company, Hartford): I move that it be adopted as printed.

(The motion was carried by a majority vote[.]*)*

Mr. Wm. B. White (New York Board of Fire Underwriters): I move the adoption of Division I of the report.

Mr. L. H. Kunhardt (President, Boston Manufacturers Mutual Fire Insurance Company): I am in entire sympathy with the purposes of this report. I wish to do everything possible to encourage sprinkler protection. Practically nothing that can be suggested is more effective in reducing fire losses than automatic sprinklers, if we provide for good water supplies.

Now, I think I am very nearly the senior member of the Automatic Sprinkler Committee; I have been on it for about thirty years. I recall very definitely some of the early work on sprinkler protection by such men as James B. Francis, of Lowell, an eminent hydraulic engineer, and Edward Atkinson and Frederick Grinnell. I think those three could well be called the fathers of sprinkler protection. Later on came Thomas J. Borden, and it was due to some of his good work that the hesitancy in regard to sprinkler installations was largely overcome. Later Mr. John R. Freeman made his "Nashua Experiments," so-called, in which were shown definitely what pipe sizes should be, to afford a good distribution of water from the sprinkler. That schedule was adopted shortly after, and it so happened that I was personally in charge on the floor of this Association of the work of getting that sprinkler schedule adopted by this Association. It standardized sprinkler requirements all over the country, and I was very glad indeed to be identified with it.

I do not wish to see this Association do anything which may weaken the value of sprinkler protection. On the other hand, I do wish to see something that will improve it. I wish to see it more generally used. There is nothing, as I have just said, that can do better work than a sprinkler system with a good water supply.

I have been interested in seeing the hesitation expressed here today by some of the members. That hesitation is justified. We want to see that there is nothing in this specification which can be misinterpreted or can lead people astray, but we do want some such schedule as this adopted for certain locations. Furthermore, we should not adopt this schedule without any consideration to safety to life in hospitals with the helpless people therein, schools and dormitories full of young girls and boys, and some hotels of perhaps not the best construction. This Association should run no risk of misinterpretation of what is good fire protection.

We should be careful about the question of areas. We should lay out a system so that if the occupancy changes or if there are structural changes in the building, we can, without ripping the whole system out, re-model it as may be necessary to fit the conditions. You may say all these matters will come under the inspection department's jurisdiction. They will, but let us make these rules a guide to good practice[.]

I want to offer a few general amendments, and my purpose is to ask that these be referred to the Executive Committee with power. They may advise, of course, if they see fit, with the Sprinkler Committee, but this thing is of importance to the whole Association and I would like to see some of these general questions referred to the Executive Committee after the discussion here this morning.

Practically all that is said under "General" is that the regulations define certain modifications of the regulations for the installation of automatic sprinkler equipments. I do not think that the word "modification" is desirable, because it indicates a modification of the standard requirements[.] *It would be much better were we to put in something like this, which, I believe, would be constructive: "General: The object of these regulations is to encourage the installation of sprinklers in buildings where the cost of a standard system is found to be prohibitive and where something less than the standard system will serve the valuable purpose of controlling a large per cent of fires and reduce the sum total of our fire losses. The numbering which follows corresponds to the numbers in the standard sprinkler regulations."*

The word "standard" is and should be applied to our standard rules, but the Class B sprinkler system should not have the word "standard" attached thereto. It is liable to cause confusion. My thought is that the word "standard" be omitted from these proposed rules on Class B sprinklers. Class B distinguishes sufficiently for all purposes.

I suggest that a note be added calling especial attention to the life hazard in such buildings as asylums, dormitories, hospitals, hotels and schools, particularly with certain combustible forms of construction, and to the need for adequate protection in such cases.

The report states that Class B "may not furnish adequate protection in all buildings (or all portions of buildings) housing the listed occupancies." That is correct, but I would change that to read "will not furnish the same complete protection as afforded by standard equipment." That is a definite statement of fact; let people understand when they put in these systems that they will not do what the standard systems would do, but that they are suitable for certain conditions where the standard system is found to be prohibitive in expense, and where we do need some protection.

In that same connection, reference is made to "occupancy which is likely to be changed subsequently to a classification not listed." If we make this specification right, gentlemen, that calls for a definite provision in regard to risers. We all know what fire department pumpers will do, under fire conditions; they will pull the pressure in the street mains down to almost nothing. Under those conditions we want the very best supply at the top of the building we can get, and it would be very undesirable to suggest in these rules that a two and a half inch riser could carry an almost unlimited number of heads. This is my suggestion: that the size of the risers should be proportioned to the area of the building and thus provide for any structural changes that may be made, and above all prevent unnecessary friction loss in getting the water to the top of the building.

This report calls for the same spacing under mill construction as under fire-resistive construction. It is true that the inspection department having jurisdiction can modify this, but it indicates that these wide spacings are just as satisfactory for one building as another. I suggest, after Mill Construction and Semi-Mill Construction, that a note be added stating that in no case shall the area per sprinkler exceed one hundred and sixty-eight square feet. That would be sixty-eight per cent more than the rules for standard equipment now permit, but it limits heads, for example, under mill construction, to a fourteen-foot bay, with the sprinklers twelve feet apart, or a twelve-foot bay with the sprinklers fourteen feet apart.

As to the limit on pipe sizes, again the inspection department has jurisdiction, but I would suggest that for two and a half inch pipe we specify a definite limit that shall not be exceeded. I think it would be well to specify forty or fifty heads. That would indicate that in an attic the standard regulations will apply, as the chairman of the committee has indicated.

One statement here rather throws discredit on gravity tanks. While it is true that a gravity tank does not furnish the initial pressure which the pressure tank does, it will furnish in so many cases infinitely better protection that there is no question in the minds of those who have used these tanks but that the gravity tank is, in general, superior. A gravity tank, it says here, "is not generally recommended." That should be reversed: "Gravity tanks may not always be practicable," or something to that effect that will indicate the possibility that they may be used. Remember that this provision for pressure tanks reads "the total capacity shall be at least 4,500 gallons." That is not as large as the largest pressure tanks installed, but it is a usual size. That water supply of 4,500 gallons means a capacity of about three thousand gallons of water, and on this basis of a water draft of 250 gallons per minute, that water supply will be exhausted in twelve minutes. There is hardly a dwelling house fire that does not take more than twelve minutes to put out. Here we are indicating that if a sprinkler equipment has water for twelve minutes, that is reasonable. I think we ought to have a little more. Fifteen or twenty thousand gallons supplied by a gravity tank is infinitely superior.

I hope that these suggestions will receive careful thought. I do not ask for their adoption here now, but I do not want to see them voted down without consideration; I appeal to the members of the Sprinkler Committee who have been so earnestly working over a long period of years to advance the cause of fire protection. I offer the following motion: that these suggestions be referred to the Executive Committee for incorporation in such form as will be found to best serve in making a consistent whole, and that they co-ordinate the other sections therewith as may be necessary. (Applause.)

Mr. Dana: I agree with most of what Mr. Kunhardt has said, although I do not agree in limiting the two and a half inch pipe to the forty or fifty heads. As a member on the committee, I voted with reservations, and my principal reservation was on the fourteen by fourteen spacing. I do not believe that it is good practice to space heads so that one head will cover one hundred and ninety-six square feet. Our present rules limit it to a hundred; this is practically doubling it. The area may be covered by one sprinkler after a fashion, but we do not get enough water.

I second Mr. Kunhardt's motion to refer the matter to the Executive Committee.

Mr. F. R. Bradford (Boston and Marne Railroad): I represent the user of the sprinkler system. We are trying to protect property. Automatic sprinkler systems have been developed and rules have been built up, over a period of years, to cover practically the worst conditions that can be imagined. Yesterday we saw motion pictures of test fires in airplane hangars showing the effectiveness of the automatic sprinkler system using the standard pipe sizes, spacings and heads. You will note that they were very effective in controlling an extremely and extraordinarily severe fire. How necessary is that extraordinarily heavy protection in a building that does not contain the quantity of combustible material to require that type of protection? Look at this room here; how much combustible material have we in this room? What kind of a fire could we possibly have in this room ? How much water do we need to put it out? There is something that, as far as I know, has never been considered in all the discussions of automatic sprinkler protection–it is the quantity of water necessary to control a fire in a certain definite quantity of combustible material. If we were structural engineers, bridge engineers, for example, we would be severely criticised if we put, let us say, the steel into a private bridge over a little brook in our own private estate, which would be required to hold the load that is necessary, for instance, for the Brooklyn Bridge. If the same amount of steel were used for building that little bridge, it would be ridiculous. So it is with the construction of a building. Would you think, for a minute, of putting in the size of beams and columns for a one-story building as are required for a building of this height? It would be absolutely out of the question, and yet that is the very thing that you are requiring now with an automatic sprinkler system in a property that does not contain the combustible material that is ordinarily found in a warehouse or a factory. Think of the room in this hotel in which you have spent the last couple of days; the room is probably in the neigh-

borhood of twelve by fourteen feet, requiring under the present standards four sprinkler heads. Is it necessary for the amount of combustible material to have discharged into that room the amount of water that would be discharged through four sprinkler heads? Try it out, you will find that you can put out that fire with a couple of two and a half gallon pump tank extinguishers or a total of five gallons of water properly distributed. And yet, under the present standard regulations, you are calling for approximately eighty gallons of water a minute, to control that little fire in that hotel room. I do not think that has been properly considered.

On the question of spacing, how do you know that a ten-foot spacing is necessary? Mr Dana says that he does not want to increase the area covered by a sprinkler head to one hundred and ninety-six feet because he would only have half the water distributed. I understand from Underwriters' Laboratories tests that the present standard sprinkler throws water over an area of one hundred and ninety-six square feet. So what you are doing with sprinkler heads eight or ten feet apart is throwing excess water in certain areas and leaving the other spots with thin protection; perhaps that is what you want; perhaps that is what is necessary; I do not know, because I have not tested it in the laboratory and as near as I can find out, nobody else has. In other words, we are guessing at this proposition. When the subject came up for discussion in the committee, it was my thought that it would be necessary to have a special sprinkler head that would cover these large spaces, but the Laboratories say no, it is not necessary, that the water is actually distributed over a fourteen-foot area. If it is, why aren't we satisfied with it? Do we need any more? We do need it in the case of pyroxylin storage, we need more sprinkler heads because of the quantity of combustible material there and we need an excess quantity of water. We know from long experience that in the ordinary warehouse and factory occupancy, that the present quantity of water discharged by the ordinary sprinkler head is sufficient, and if it is sufficient for that occupancy, it certainly is doubly sufficient for the ordinary occupancy intended to be covered by these proposed regulations. I am in favor of having this thing referred back to the Executive Committee for further study. I do not think we should rush into it; I would be in favor of having some real tests made to find out how much water we need to put out a fire in a certain quantity of material distributed in a light occupancy building.

Mr. White: I rise to a point of order. I made a motion to accept the report of the committee, and I call for the question.

Mr. E. V. French (President, Arkwright Mutual Fire Insurance Company, Boston): I do not know the exact parliamentary status of this matter, but would like to discuss it a little further; I want to make a brief plea on a matter of policy. For nearly thirty-five years, I have had an interest in the progress of this Association. There is no very important difference between those of us who are looked on as conservative and those perhaps who feel that they are more progressive. The one thing that has made fire protection what it is today is the putting into it the true spirit of engineering, which is to first ascertain the facts and then apply them intelligently, never to require more than is necessary to accomplish the purpose in hand, but never to require less. I hope that this Association will keep its deliberations and keep its decisions on a plane which will make it really one of the standard engineering societies of this country, as it is, and to do that we must be ready, when we come to problems of this somewhat intricate nature, to see both sides of the matter. There have been some differences of opinion in the Sprinkler Committee, as there naturally would and should be, as to what is the best sort of rule to make in this effort to extend sprinkler protection over a wider field. I think even the most conservative of us old fellows are heartily in sympathy with the idea of pushing sprinklers and making the conditions of installation such that they can be put into a good many places where they have not been available before because of the expense.

Long ago when the electrical rules were being made, which was one of our first large pieces of work of standardization, there were many questions of just this kind arising all the time, and we felt that it was one of the functions of the Underwriters' National Electric Association to give, on the one hand, reasonable flexibility and opportunity for that exercise of judgment which is always essential for the best results, but on the other, knowing how easy it is for divergent practices to become established and for standards to be broken down, to make an earnest effort to make the rules so definite and so clear that all over this great country and Canada, the man using the rules had a very easily followed guide as to what he should do. It seems to me from the discussion of these proposed new sprinkler rules, that the wording of the present report may lead to the installation of some systems which will fail to give the safety for which they were provided, because a very little more cost was not put into them when installed[.] *That is going to result in some disappointing fires and may result in some loss of life. The only changes that some of us feel ought to be made are in the direction of definiteness in places where several things have been left rather wide open. The exact method of accomplishing this is almost impossible to determine here in the open meeting. It should be worked out with care and thought when the fundamental principle for which we are striving is accepted, and I hope that this Association will be willing to look at the problem in a broad way as one of the most vital matters before us. I say most vital because I think we all know that the one thing that has brought about control of the fire waste, more than any other, is the automatic sprinkler.*

The questions that have been before us this morning really need a little more study, a little of that ironing out of differences, a little of that ingenuity and flexibility of thought which I am sure, if put in it, will result in such slight modifications in what the committee, after their earnest labors, have suggested, as to cover all these points and give a new code for this particular type of sprinkler work which will be clear and definite and safe, and which will mark further progress in fire control through the right use of automatic sprinklers. (Applause.)

The President: Gentlemen, we have before us a motion to approve Division I. That motion was seconded, then Mr. Kunhardt presented certain constructive suggestions which he desires to be referred to the Executive Committee with power to act. They, of course, would then confer with the Committee on Automatic Sprinklers, and out of that would come, as Mr. French says, we hope, a very fine report.

Mr. Dana Pierce (President, Underwriters' Laboratories)[:] *I am in doubt whether Mr. Kunhardt's motion is an instruction to the Executive Committee to include these things with such editing and modification as they see fit, or whether it is intended that the Executive Committee shall have the option to accept or reject all of his amendments. I want to know, as a member of the Executive Committee. In the latter case, I point out to the Association the fact that you are transferring the duties of the Sprinkler Committee to the Executive Committee.*

Mr. Kunhardt: I think the words "to refer to the Executive Committee with power" are quite definite; I intended that they should modify or reject as they see fit.

(Mr. Kunhardt's motion was then voted on and defeated.)

The President: We will vote now on the original motion.

(The original motion was adopted by a majority vote.)

Given the length of the discussion, it is easy to surmise that the introduction of new rules for Class B (light hazard) sprinkler systems was a controversial step. It is interesting to note that this major step forward took 34 years to develop after the introduction of the first edition of the rules for sprinkler system design and installation.

Perhaps what is most interesting about the discussion is the understanding that sprinklers could be utilized to protect, not only property, but also occupants of buildings, but that cost was a major impediment to the use of this important life safety tool in office buildings, apartment buildings and in institutional buildings.

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