1987 Annual Meeting
Technical Committee Documentation

A Compilation of the Documented Action on Comments Received by the Technical Committees Whose Reports Have Been Published Prior to Consideration at the NFPA Annual Meeting

Cincinnati Convention/Exhibition Center
Cincinnati, OH
May 18–21, 1987

Please Bring to the Annual Meeting

Copyright © 1987
All Rights Reserved
National Fire Protection Association, Inc.
Batterymarch Park, Quincy, MA 02269
SUPPLEMENTARY

Report of Committee on
Fire Department Equipment

Chief William F. Foley, Chairman
Chicago, IL

Kenneth L. Koch, Secretary
Sutphen Corp.

D. M. Baird, Insurers Advisory Organization
William H. Barnes, Akron Brass Co.
Del Bilyeu, Howe Fire Apparatus Co.
Rep. Fire Apparatus Mfg Div. of TBEA
Paul L. Blankenship, California Dept. of Forestry
David R. Bouchard, Warwick, RI
Patrick H. Ciangola, Underwriters Laboratories Inc.
Chief J. G. Cote, Broadview Fire Dept., IL
Rep. Int'l Assn. of Fire Chiefs
Samuel C. Cramer, Aluminum Ladder Co.
J. A. Foster, ISO Commercial Risk Services Inc.
John W. McDonald, DC Fire Dept., VA
Larry McMillen, Fort Worth Fire Dept., TX
Ronald K. Melott, Melott & Associates Inc.
Heinz E. Otte, Waterous Co.
A. K. Rosenhan, Mississippi State University
Joseph P. Shovlin, City of Aurora Fire Dept., CO
James T. Wooters, DeKalb County Fire Services

Alternates

W. J. Darley, W. S. Darley & Co.
(Alternate to TBEA Rep.)
Roger A. Ruth, Nat'l Foam System Inc.
(Alternate to D. Bilyeu)
Bradley J. Schmidt, Underwriters Laboratories Inc.
(Alternate to P. Ciangola)
Charles C. Soros, Seattle Fire Dept.
(Alternate to IAFF)
David F. Thomas, W. St. Paul, MN
(Alternate to H. E. Otte)

Nonvoting

Robert C. Dickson, Ford Motor Co.

This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred.

The Supplementary Report of the Committee on Fire Department Equipment is presented for adoption.

This Supplementary Report was prepared by the Technical Committee on Fire Department Equipment and proposes for adoption a Supplementary Report which documents its action on the public comments received on the proposed new document, NFPA 1911-1987, Standard on Acceptance and Service Tests of Fire Department Pumping Apparatus, published in the Technical Committee Reports for the 1987 Annual Meeting.

This Supplementary Report has been submitted to letter ballot of the Technical Committee on Fire Department Equipment which consists of 20 voting members; of whom 18 voted affirmatively, and 2 ballots were not returned (Messrs. Darley and Soros).
COMMENT ON PROPOSAL NO. 1911-2 - (2-3.3.1): Accept in Principle

SUBMITTER: E. B. (Ned) Aksim, PE, Akron Brass Company

COMMENT ON PROPOSAL NO. 1911-2 - (2-3.3.1): Accept in Principle

RECOMMENDATION: Revise first sentence to read:

"Nozzles. Where nozzles are used, they shall be smoothbore, with known coefficient of discharge, and of a size sufficient for anticipated flows." and change from subparagraph 2-3.3.1 to 2-3.3.1.1.

RECOMMENDATION: Add:

"Pitot tubes shall be held parallel to stream flow, in the center of the stream and with the tip half the nozzle diameter away from the end of the nozzle.

COMMITTEE ACTION: Reject.

SUBMITTER: E. B. (Ned) Aksim, PE, Akron Brass Company

COMMENT ON PROPOSAL NO. 1911-3 - (2-3.3.2): Accept in Principle

SUBMITTER: Edward T. Grohe, Western Fire Equipment Co.

COMMENT ON PROPOSAL NO. 1911-3 - (2-3.3.2): Accept in Principle

RECOMMENDATION: Revise first sentence as follows:

"Pitot tubes shall be held parallel to stream flow, in the center of the stream and with the tip half the nozzle diameter away from the end of the nozzle.

COMMITTEE ACTION: Accept in Principle.

SUBMITTER: Edward T. Grohe, Western Fire Equipment Co.

COMMENT ON PROPOSAL NO. 1911-4 - (2-3.3.2): Reject

COMMENT ON PROPOSAL NO. 1911-4 - (2-3.3.2): Reject

RECOMMENDATION: Revise text as follows:

"Pitot tubes shall be held parallel to stream flow, in the center of the stream and with the tip half the nozzle diameter away from the end of the nozzle.

COMMITTEE ACTION: Reject.

SUBMITTER: Edward T. Grohe, Western Fire Equipment Co.

COMMENT ON PROPOSAL NO. 1911-5 - (2-3.4.2): Reject

COMMENT ON PROPOSAL NO. 1911-5 - (2-3.4.2): Reject

RECOMMENDATION: Revise text as follows:

"Pitot tubes shall be held parallel to stream flow, in the center of the stream and with the tip half the nozzle diameter away from the end of the nozzle.

COMMITTEE ACTION: Accept in Principle.

SUBMITTER: Edward T. Grohe, Western Fire Equipment Co.

COMMENT ON PROPOSAL NO. 1911-6 - (2-3.4.2): Accept

COMMENT ON PROPOSAL NO. 1911-6 - (2-3.4.2): Accept

RECOMMENDATION: Revise text as follows:

"Pitot tubes shall be held parallel to stream flow, in the center of the stream and with the tip half the nozzle diameter away from the end of the nozzle.

COMMITTEE ACTION: Accept.

SUBMITTER: Edward T. Grohe, Western Fire Equipment Co.

COMMENT ON PROPOSAL NO. 1911-7 - (2-3.4.2): Accept

COMMENT ON PROPOSAL NO. 1911-7 - (2-3.4.2): Accept

RECOMMENDATION: Revise text as follows:

"Pitot tubes shall be held parallel to stream flow, in the center of the stream and with the tip half the nozzle diameter away from the end of the nozzle.

COMMITTEE ACTION: Accept.

SUBMITTER: Edward T. Grohe, Western Fire Equipment Co.

COMMENT ON PROPOSAL NO. 1911-8 - (2-3.4.2): Accept

COMMENT ON PROPOSAL NO. 1911-8 - (2-3.4.2): Accept

RECOMMENDATION: Revise text as follows:

"Pitot tubes shall be held parallel to stream flow, in the center of the stream and with the tip half the nozzle diameter away from the end of the nozzle.

COMMITTEE ACTION: Accept.
1911-8 (C-1): Accept in Principle

SUBMITTER: E. B. (Ned) Aksim, PE, Akron Brass Company

COMMENT ON PROPOSAL NO.: 1911-8

RECOMMENDATION: Eliminate the definition of C in the paragraph after the table. Replace with:

"C is a constant dependent upon a number of factors including pitot pressure, the ratio of diameters at the base and outlet of the nozzle, the shape of the nozzle etc.

Normally this factor is insignificant compared to the accuracy of the gage readings. The nozzle manufacturer should be contacted for further details."

SUBSTANTIATION: This conversion factor does not depend only upon the diameter of the orifice. It also depends on the Reynold's Number (which is a velocity related number and therefore related to pitot pressure), the roughness of the inside surface, the change in diameter of the waterway, the rate of change of diameter (angle of the ID of the nozzle), the ratio of the diameter of the pitot pickup compared to the diameter of the stream, as well as variables. Below is a summary of some tests to determine the "C" factors for different sized nozzles at different pitot pressures.

The gage specified for the pitot pickup must be accurate with ±1 percent of the full scale reading in the middle of its range. This leads to an allowable error of 4 percent of flow with a 0-200 psi gage or 10 percent of flow with a 0-400 psi gage. The correction for 0.3 percent to 1 percent seems to be pointless.

COMMITTEE COMMENT: Previously revised text points out that the coefficient of discharge should be determined for the nozzle used. The Committee's suggested rewording of the text on calculating the results will allow the person conducting the tests to calculate the pump discharge using the coefficient of discharge, if known, or to use the tables recognizing that these may be in error by an unknown factor.

1911-9 (Table C-4): Accept in Principle

SUBMITTER: E. B. (Ned) Aksim, PE, Akron Brass Company

COMMENT ON PROPOSAL NO.: 1911-9

RECOMMENDATION: Change all 4 tables to show the theoretical discharge without the "C" factor.

SUBSTANTIATION: The "C" factor is not dependent only on the orifice size.

The accuracy of 1/4 of 1 percent indicated by these factors is insignificant when compared to the 4 percent to 10 percent variation in flow allowed by gage accuracy.

COMMITTEE ACTION: Accept in Principle.

See Committee Action on Public Comment 1911-8.

COMMITTEE ACTION: Accept in Principle.

(a) Revise the first paragraph in Appendix C, "Calculating the Results," to read as follows:

"If nozzles and pitot tubes have been used to measure pump capacity, the values of capacity are determined by the following formula:

\[ \text{Gallons per minute} = 29.83 \times c \times d \times \sqrt{p} \]

where \(d\) = diameter of nozzle in inches

\(p\) = pressure of pitot gage, psi

\(c\) = coefficient of discharge of the nozzle used.

The pitot pressure should be the average of several readings and corrected for gage error."

(b) Revise the second paragraph under "Calculating the Results" to read as follows:

"For nozzle sized from 1/4 inch to 2 1/4 inches values of capacity may be approximated from Tables C-1 (a), (b), (c), and (d); however, as these values are based on certain assumed coefficients of discharge they may be considerably at variance with the actual values. For nozzles larger than 2 1/4 inches, approximate values of capacity may be obtained from Table C-4."

(c) Change numbers of tables as follows:

C-1 to C-4

C-4 (a), (b), (c), and (d) to C-1 (a), (b), (c), and (d).

(d) Revise heading in Table C-4 (old C-1) by eliminating present text and placing the following below the table:

"Capacity in gallons per minute is determined by the following formula:

\[ \text{GPM} = \frac{f}{p} \sqrt{p} \]

where \(f\) = factor from the table

\(p\) = pressure at pitot gage, psi".