Report of the Committee on Foam

Christopher P. Hanauska, Chair
Hughes Associates, Inc., MD [SE]

Antonio C. Caro, Rolfini & Associates, CO [SE]
Salvatore A. Chines, Industrial Risk Insurers, CT [I]
Gene DiClemente, Glenview Fire Department, IL [E]
Arthur R. Dooley, Jr., Dooley Tackaberry, Inc., TX [IM]

Francis X. Dunigan, Jr., Angus Fire North America/Williams Holdings, NC [M]
Robert A. Green, Public Service Electric & Gas Company, NJ [U]
Rep. Edison Electric Institute

Randall Hendricksen, ChemGuard, Inc., TX [M]
Eldon D. Jackson, The Viking Corporation, MI [M]

John A. Krembs, Marsh USA, Inc., IL [I]
Eric LeVergne, Williams Fire and Hazard Control, TX [M]
Robert C. Merritt, FM Global, MA [I]

Francisco N. Nazario, Exxon Research & Engineering Company, VA [U]
Rep. America Petroleum Institute

Edward C. Norman, Aqueous Foam Technology, Inc., PA [SE]
Keith Olson, Tyco Suppression Systems, WI [M]
Richard E. Ottman, 3M Company, MN [M]
Michael F. Pierson, CSC Advanced Marine, VA [SE]
Fay Purvis, Vector Fire Technology, Inc., PA [SE]

Tom Reser, Edwards Manufacturing Inc., OR [M]
Howard L. Vandersall, Lawton Fire Services, Inc., CA [SE]
Klaus Wahle, U.S. Coast Guard Headquarters, DC [E]
B. J. Walker, Walker & Associates, MO [SE]
David R. Whitling, ARCO Marine Inc., CA [U]
Michel Williams, Ultramar Canada Ltd., Canada [U]
Rep. NFPA Industrial Fire Protection Section

Kenneth W. Zastrow, Underwriters Laboratories Inc., IL [RT]

Alternates

Randall Eberly, U.S. Coast Guard Headquarters, DC [E]
(Alt. to K. Wahle)

Kevin P. Kuntz, Marsh USA, Inc., NJ [I]
(Alt. to J. A. Krembs)

Ronald Mahlman, The RJA Group, Inc., CA [SE]
(Alt. to A. Caro)

Norbert W. Makowka, National Association of Fire Equipment Distributors, IL [IM]
(Alt. to A. R. Dooley)

Emil W. Misichko, Underwriters Laboratories Inc., IL [RT]
(Alt. to K. W. Zastrow)

Tim Pope, McDaniel Fire Systems, IN [IM]
(Voting Alt. to FSSA Rep.)

Paul E. Rivers, 3M Company, MN [M]
(Alt. to R. E. Ottman)

(Alt. to C. P. Hanauska)

Steven F. Vieira, Tyco International, Limited, RI [M]
(Alt. to K. Olson)

Nonvoting

Richard F. Murphy, Cranford, NJ [SE]
(Member Emeritus)

Staff Liaison: David R. Hague

Committee Scope: This Committee shall have primary responsibility for documents on the installation, maintenance, and use of foam systems for fire protection, including foam hose streams.

This list represents the membership at the time the Committee was ballot on the text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the front of this book.

The Technical Committee on Foam is presenting two Reports for adoption, as follows:


NFPA 11 has been submitted to letter ballot of the Technical Committee on Foam, which consists of 27 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.


NFPA 11A has been submitted to letter ballot of the Technical Committee on Foam, which consists of 27 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.
11-1 - (Entire Document): Accept

SUBMITTER: Technical Committee on Foam

RECOMMENDATION: Restructure entire document to comply with the NFPA Manual of Style as follows:
1. Chapter 1 to contain administrative text only.
2. Chapter 2 to contain only referenced publications cited in the mandatory portions of the document.
3. Chapter 3 to contain only definitions.
4. All mandatory sections of the document must be evaluated for usability, adoptability, and enforceability language. Generate necessary committee proposals.
5. All units of measure in the document are converted to SI units with inch-pound units in parentheses.
6. Appendices restructured and renamed as “Annexes.”


COMMITTEE ACTION: Accept.

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 27

VOTE ON COMMITTEE ACTION:

AFFIRMATIVE: 21

NOT RETURNED: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

11-2 - (Chapter 1 and 7): Accept

SUBMITTER: Technical Committee on Foam

RECOMMENDATION: Add a new Chapter 7 “Medium and High Expansion Foam Systems” incorporating NFPA 11A in its entirety as follows:
NFPA 11A Sections 1-1 through 1-5 to be added to the existing Chapter 1 of NFPA 11.
NFPA 11A Sections 1-7 through 1-13 and Chapters 2 through 4 to be added to a new Chapter 7 in NFPA 11 (rename existing NFPA 11A to 11A).

SUBSTANTIATION: Incorporates appropriate sections of NFPA 11A.

COMMITTEE ACTION: Accept.

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 27

VOTE ON COMMITTEE ACTION:

AFFIRMATIVE: 21

NOT RETURNED: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

11-3 - (1.1 Scope): Accept

SUBMITTER: Technical Committee on Foam

RECOMMENDATION: Revise the scope of NFPA 11 to include medium and high expansion foam. Scope will now read as follows:
1-1 Scope. This standard covers the design, installation, operation, testing and maintenance of low, medium and high expansion foam systems for fire protection. Characteristics of foam producing materials used for fire protection and the requirements for the design, installation, operation, testing, and maintenance of equipment and systems for flammable and combustible liquid hazards and local areas within buildings, and storage tanks and indoor and outdoor processing areas.
1-2 It is not the intent of this standard to specify where foam protection is required. (To determine where foam protection is required, see applicable standards such as NFPA 30, Flammable and Combustible Liquids Code.)
1-3 Foam can be applied to protect the surface of a flammable liquid that is not burning. The foam concentrate manufacturer shall be consulted to determine the optimum method of application, rate of discharge, application density, and frequency of reaplication required to establish and maintain the integrity of the foam blanket.
1-4 This standard is not applicable to the following types of systems:
   - a. Chemical foams and systems (considered obsolete).
   - d. Combined agent systems.

11-4 - (1-4 Definition (GOT)): Accept

SUBMITTER: Technical Committee on Foam

RECOMMENDATION: Adopt the preferred definition from the NFPA Glossary of Terms for the following term:
Discharge Device (preferred) 25
A device designed to discharge water or foam-water solution in a predetermined, fixed, or adjustable pattern. Examples include, but are not limited to, sprinklers, spray nozzles, and hose nozzles.
Discharge Device (secondary) 25
A fixed, semifixed, or portable device that directs the flow of foam to the fire or flammable liquid surface.

SUBSTANTIATION: Adoption of preferred definitions will assist the user by providing consistent meaning of defined terms throughout the National Fire Codes.

COMMITTEE ACTION: Accept.

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 27

VOTE ON COMMITTEE ACTION:

AFFIRMATIVE: 20

NEGATIVE: 1

NOT RETURNED: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

EXPLANATION OF NEGATIVE:
DOOLEY: This committee and its standard(s) deal only with discharge devices for foam, not water or foam-water solution. The secondary definition is the only appropriate one for us to adopt.

11-5 - (2-2.1): Accept in Principle

SUBMITTER: Tom Reser, Edwards Manufacturing Inc.

RECOMMENDATION: Revise text to read as follows:
2-2 Water and foam pumps. When water or foam pumps are required for foam system operation, they shall be designed and installed in accordance with NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection.

SUBSTANTIATION: The added language directs the user to the renamed NFPA 20 standard and indicates to the NFPA 11 standard user that foam pumps are now part of NFPA 20 standard.
Consistent with other NFPA documents. Editorial in nature and adds clarity.

COMMITTEE ACTION: Accept in Principle.

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 27

VOTE ON COMMITTEE ACTION:

AFFIRMATIVE: 21

NOT RETURNED: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

11-6 - (2-4.1 and A-2-4.1): Accept in Principle

SUBMITTER: Richard E. Ottman, 3M Center

RECOMMENDATION: Revise text as follows:
2-4.1 Compatibility of Foam Concentrates – Different types and/or brands of foam concentrates shall not be mixed for storage
unless data are provided and accepted by the Authority Having Jurisdiction to prove that they are compatible. Foams Generated separately from protein, fluoroprotein, FFFP and AFFF concentrates shall be permitted to be applied to a fire in sequence or simultaneously.

A-2.4.1 Often, different brands of the same type of Foam Concentrates are found to be chemically compatible. However, before different types or brands of concentrates are mixed for long term storage, evaluations should be made to determine such compatibility. A number of parameters should be considered and evaluated before concentrates are mixed for storage. In addition to the chemical compatibility, one should consider effects on proportioning and discharge hardware (many Listings and Approvals are very specific with regard to operating pressures, flow ranges and materials of construction of hardware components). Fire performance and foam quality resulting from the admixture of two concentrates should be no worse than the individual concentrates used in the admixture. The system design application rate (density) may have to be changed if one of the Foam Concentrates being admixed is Listed or Approved at an application rate (density) that is higher than the one used for the initial design. This generally applies to fire performance to ensure that no decline in temperature conditioned or cycled admixtures should also be evaluated for evidence of sedimentation, crystallization, sludging, separation, layering, stratification etc. as well as for changes to physicochemical properties such as pH, specific gravity, of viscosity. If variables in specific gravity and/or viscosity are noted, it may be necessary to conduct proportioning system tests to verify proper injection rate of the admixed concentrate. This is especially applicable for alcohol resistant concentrates where wide variations in physical properties between manufacturers exist.

The temperature conditioned or cycled admixtures should also be evaluated for fire performance to ensure that no decline in performance has occurred as a result of the mixing. Ideally, the fire performance of the admixtures should be determined both prior to and after the temperature conditioning or cycling and compared to the individual concentrates fire performances. As a guide, one may consult paragraph 3.3.3 of the US Military Specification for AFFF, MIL-F-24385F (7 January 1992) or Underwriters Laboratories of Canada Standard (CAN/ULC-S655-98 Standard for Category 3 Aquous Film-Forming Foam (AFFF) Liquid Concentrates (September 1998) Section 4.7.2. Keep in mind that the fire tests as described by these reference documents may not be appropriate for the particular concentrates for which compatibility information and data are being sought.

COMMITTEE ACTION: Accept in Principle.

REVISE TEXT AS FOLLOWS:  2-4.1 Compatibility of Foam Concentrates* Different types and/or brands of foam concentrates shall not be mixed for storage. Different brands of the same type of concentrate shall not be mixed unless data are provided and accepted by the Authority Having Jurisdiction to prove that they are compatible. Foams Generated separately from protein, fluoroprotein, FFFP and AFFF concentrates shall be permitted to be applied to a fire in sequence or simultaneously.

A-2.4.1 Often, different brands of the same type of Foam Concentrates are found to be chemically compatible. However, before different types or brands of concentrates are mixed for long term storage, evaluations should be made to determine such compatibility. A number of parameters should be considered and evaluated before concentrates are mixed for storage. In addition to the chemical compatibility, one should consider effects on proportioning and discharge hardware (many Listings and Approvals are very specific with regard to operating pressures, flow ranges and materials of construction of hardware components). Fire performance and foam quality resulting from the admixture of two concentrates should be no worse than the individual concentrates used in the admixture. The system design application rate (density) may have to be changed if one of the Foam Concentrates being admixed is Listed or Approved at an application rate (density) that is higher than the one used for the initial design. This generally applies to alcohol resistant foams since their Listings and Approvals are very application rate sensitive.

Add a new definition to read as follows:

"Foam Concentrate Type. A classification of a foam concentrate that includes the chemical composition as defined under foam concentrate Section 1-4, including the use percentage, the minimum usable temperature and the fuels on which the concentrate is effective."

COMMITTEE STATEMENT: This change will permit the substitution of different brands of foam concentrate provided that the manufacturer has produced documentation to verify compatibility.

AFFIRMATIVE: 21

NOT RETURNED: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11- 7 - (26.1): Accept

SUBMITTER: Tom Reser, Edwards Manufacturing Inc

RECOMMENDATION: Revise text as follows:

"The design and materials of construction for foam concentrate pumps shall be in accordance with NFPA 20 Standard for the Installation of Stationary Pumps for Fire Protection, suitable for use with the type of foam concentrate used in the system. Special attention shall be paid to the type of seal or packing used.

SUBSTANTIATION: The updated NFPA 20, Chapter 5 contains specific language that addresses materials of construction, design and seal types for use in foam pumps. Directs NFPA 11 user to detailed pump data and provides direction and clarity.

COMMITTEE ACTION: Accept.

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 27

VOTE ON COMMITTEE ACTION: AFFIRMATIVE: 21

NOT RETURNED: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11- 8 - (26.1.1): Accept

SUBMITTER: Tom Reser, Edwards Manufacturing Inc.

RECOMMENDATION: Delete text as follows:

"Where pumps utilizing cast or ductile iron components are used, the pumps shall be left flooded with concentrate to minimize corrosion, foaming, or structure.

SUBSTANTIATION: This subparagraph is no longer needed.

NFPA 20 provides clear pump material and installation detail and specific language that addresses materials of construction, design and seal types for use in foam pumps. Directs NFPA 11 user to detailed pump data and provides direction and clarity.

COMMITTEE ACTION: Accept.

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 27

VOTE ON COMMITTEE ACTION: AFFIRMATIVE: 21

NOT RETURNED: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11- 9 - (27.4): Accept

SUBMITTER: Tom Reser, Edwards Manufacturing Inc.

RECOMMENDATION: Revise text as follows:

1st sentence intact. The ratio of the strainer's open basket area to its inlet pipe area shall be at least 10:1. The net open area of the strainer shall be at least four times the area of the suction piping. Strainer mesh size shall be in accordance with the pump manufacturer's recommendation.

SUBSTANTIATION: Makes language consistent with NFPA 20 and provides clarity to consider mesh size in the strainer to ensure adequate pump and foam system protection from debris.

COMMITTEE ACTION: Accept.

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 27

VOTE ON COMMITTEE ACTION: AFFIRMATIVE: 21

NOT RETURNED: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11- 10 - (27.5): Accept

SUBMITTER: Technical Committee on Foam

RECOMMENDATION: Revise Section 2-7.3 to read as follows:

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2-7.5.6 Valves. All valves for water and foam solution lines shall be of the indicator type, such as OSSY or post indicator. Automatic valves for foam concentrate lines shall be listed for this service.

Valve specifications normal for water use shall be permitted outside the hazard or diked area. Inside the hazard or diked area, automatic control valves and shutoff valves shall be of steel or other alloy capable of withstandng exposure to expected fire temperatures.

2-7.5.1

Substantiation: Listed valves are desired for improved reliability.

Committee Action: Accept

Number of Committee Members Eligible to Vote: 27

Vote on Committee Action: Affirmative: 21

Not Returned: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11-11-5 (5-1): Reject

Submitter: Tom Reser, Edwards Manufacturing Inc.

Recommendation: Revise text to read as follows:

“Pressure shall not exceed Foam pump discharge pressure shall not exceed the working pressure of the concentrate piping system. Because displacement and centrifugal foam pumps capable of over-pressurizing the system shall be provided with adequate means of pressure relief, an approved pressure relief valve. Relief from the discharge to the supply side of the circuit to prevent excessive pressure and temperature. The pressure relief valve shall be installed in accordance with NFPA 20, Standard for Installation of Stationary Pumps for Fire Protection.”

Substantiation: The current paragraph conflicts with NFPA 20 guidelines with pressure relief valve installation for foam pumps. Approved pressure relief valves are now available for foam service. NFPA 20 has specific directions and DWG’s on how to install pressure relief valves, this adds clarity and direction for the user.

Committee Action: Reject.

Committee Statement: At the request of the submitter.

Number of Committee Members Eligible to Vote: 27

Vote on Committee Action: Affirmative: 21

Not Returned: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11-12-5 (5-2): Accept in Principle

Submitter: Tom Reser, Edwards Manufacturing Inc.

Recommendation: Delete text as follows:

“Flushing. Pumps shall have adequate means for flushing with water. They shall be provided with a drain cock or valve.”

Substantiation: Delete 5.2 in entirety. No pumps are available for foam service that have a flush port, drain cock or valve. The foam system piping has flush connections as standard and thus the foam pump can be flushed if necessary. Avoids conflicts and misunderstandings.

Committee Action: Accept in Principle.

Revise Section 5.2 as follows:

5.2 Flushing. Pumps shall have adequate means for flushing with water. They should be provided with a drain cock or valve.

Committee Statement: A flushing connection is needed for the foam concentrate line.

Number of Committee Members Eligible to Vote: 27

Vote on Committee Action: Affirmative: 21

Not Returned: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11-13-6.1.2: Reject

Submitter: Robert L. Darwin, Hughes Assoc., Inc.

Recommendation: Delete 6.1.2.

Substantiation: The test method required by 6.1.2.1 (contained in Appendix F) is biased toward foams that generally exhibit slow extinguishment times. There are flammable liquid fire fighting scenarios in a marine environment where speed of extinguishment is essential, and in fact, where speed of extinguishment may be more important than achieving a lengthy burnback resistance. Examples would be fires where people are threatened by a pool fire, such as fire beneath an occupied helicopter on a ship helipad, fuel fires on ferry cars decks where passengers are in their cars and similar scenarios involving immediate threats to life safety.

The mandated test was extracted from an antiquated specification for old protein based foams. Compared to film-forming agents, numerous test programs in the past 30 years have shown that, while protein foam may exhibit somewhat better burnback resistance, speed of extinguishment is markedly inferior.

It is doubtful whether Mil-Spec AFFF (qualified to military specification MIL-F-24385) could pass the rigid sealability and burnback tests in Appendix F. Yet Mil Spec AFFF is used on all US Navy ships and many foreign Navy ships as well. Navies have selected AFFF to replace protein foams because they have made a conscious decision that rapid fire control time is more important than burnback resistance. The Mil Spec does include quantitative burnback and sealability performance requirements, but they are not as rigid as in the old protein spec. As currently written, 6-1.2.1 probably places Navy ships in non-compliance with NFPA 11. In the US, this would be contrary to DOD Acquisition Reform which mandates that all defense agencies should adopt national consensus standards.

The choice between quick knockdown and extended burnback will depend on the nature of the perceived fire threats - a decision which should be left to the authority having jurisdiction.

Committee Action: Reject.

Committee Statemant: The committee feels that this is appropriate for the protected hazard.

Number of Committee Members Eligible to Vote: 27

Vote on Committee Action: Affirmative: 21

Not Returned: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11-14-9 (8-1.3): Reject

Submitter: Michael F. Pierson, CSC Advanced Marine

Recommendation: Add text to read as follows:

“...and shall be stored in an accessible location not exposed to the hazard they protect.”

Substantiation: Although this requirement is stated in Paragraph 4.3.2.1 of the document, 8.1 removes the provision “unless specifically referenced”; paragraph 4.3.2.1 is not specifically referenced in Chapter 8. Insertion of 4.3.2.1 as a reference brings in unnecessary text, hence the recommendation to insert only the applicable text.

Committee Action: Reject.

Committee Statement: The submitter’s concern is addressed in Section 6.11.

Number of Committee Members Eligible to Vote: 27

Vote on Committee Action: Affirmative: 21

Not Returned: 6 Chines, Dunigan, Pierson, Pope, Walker, Zastrow

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11-15-A1-14, 3.2.2.4: Accept

Submitter: Technical Committee on Foam

Recommendation: Delete the following Section and Section 3.2.2.4:

A.1.4 Type I Discharge Outlet.

Approved Type I discharge outlets include the following:

(a) Porous tubes [See Figure A-1-4(n).]

(b) Foam troughs along the inside of tank wall [See Figure A-1-4(o).]

These outlets are designed to extinguish fire with a minimum of foam-producing materials. It should be noted, however, that Type I devices become Type II devices if they suffer mechanical damage. Type I discharge outlets are generally considered obsolete because nearly all currently manufactured foams are suitable for use with Type II discharge outlets. [See Figure A-1-4(p).]

Porous Tube. The coarsely woven tube is rolled up in the foam chamber, one end being securely fastened to the foam supply line and the free end being tied to close the opening at this point. When foam is admitted to the tube, the diaphragm closing the mouth of the chamber is broken out by the pressure of the tube against it. The tube then unrolls, dropping into the tank. The
bubonic of the foam causes the tube to rise to the surface and
foam to flow through the interstices of the fabric directly onto the
liquid surface.

- Figure A-1-4(n) Cross section of a Moeller tube chamber. Tube is
designed to unroll and fall to oil level. Foam flows through
interstices in tube.
- Figure A-1-4(o) Foam trough.

**SUBSTANTIATION:** Obsolete technology.

**COMMITTEE ACTION:** Accept.

**NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE:** 27

**VOTE ON COMMITTEE ACTION:**

- **AFFIRMATIVE:** 20
- **NEGATIVE:** 1
- **NOT RETURNED:** 6 Chines, Dunigan, Pierson, Pope, Walker,
Zastrow

**EXPLANATION OF NEGATIVE:**

DOOLEY: Even though these methods are not often used, the
gentle application they afford is the preferred method for effectively
and efficiently applying foam to any liquid surface. Such devices
are not obsolete, they are simply seldom used. They should
remain in the standard and continue to receive the current
advantageous lessoned foam concentrate supply requirement vs.
other methods as provided in Table 3-2.3.2.2.

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**11-16 - (A-2-6): Reject**

**SUBMITTER:** Tom Reser, Edwards Manufacturing Inc.

**RECOMMENDATION:** Delete last sentence:

“Provisions should be made for automatic shut off of the foam
concentrate pump after the concentrate supply is exhausted.”

**SUBSTANTIATION:** Automatic shut off of foam concentrate or
any fire pump is specifically not allowed by NFPA 20, Standard for
the Installation of Stationary Pumps for Fire Protection.

**COMMITTEE ACTION:** Reject.

**COMMITTEE STATEMENT:** Automatic shutoff is desired since
failure to do so can result in destruction of the foam concentrate
pump.

**NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE:** 27

**VOTE ON COMMITTEE ACTION:**

- **AFFIRMATIVE:** 20
- **NEGATIVE:** 1
- **NOT RETURNED:** 6 Chines, Dunigan, Pierson, Pope, Walker,
Zastrow

**EXPLANATION OF NEGATIVE:**

RESER: See my Explanation of Negative for Proposal 11-16 (Log 
#1).

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**11-17 - (A-51): Reject**

**SUBMITTER:** Tom Reser, Edwards Manufacturing Inc.

**RECOMMENDATION:** Delete:

AS-1 Provisions should be made for automatic shut off of the
foam concentrate pump after the foam concentrate supply is exhausted.

**SUBSTANTIATION:** Automatic shut off of foam concentrate
pumps is specifically not allowed by NFPA 20 Standard for the
Installation of Stationary Pumps for Fire Protection.

**COMMITTEE ACTION:** Reject.

**COMMITTEE STATEMENT:** Automatic shutoff is desired since
failure to do so can result in destruction of the foam concentrate
pump.

**NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE:** 27

**VOTE ON COMMITTEE ACTION:**

- **AFFIRMATIVE:** 20
- **NEGATIVE:** 1
- **NOT RETURNED:** 6 Chines, Dunigan, Pierson, Pope, Walker,
Zastrow

**EXPLANATION OF NEGATIVE:**

RESER: See my Explanation of Negative for Proposal 11-16 (Log 
#2).

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SUBMITTER: Technical Committee on Foam

RECOMMENDATION: Add the following method to Section E-6-3.2

Method for Determining the Effective Amount of Antifoam

Apparatus:
- Balance - 1600 gram capacity minimum - readability 0.2 grams maximum
- 2 liter beaker or similar container
- Eyedropper
- Optional - 10 ml pipette

1. In the 2 liter beaker, weigh out one gram (one ml) of antifoam using an eyedropper or the pipette.
2. Add 999 grams of water.
3. Mix well.
4. Weigh out 1000 grams of the solution to be defoamed and place it in the gallon jug.
5. Add 10 grams (10 mls) of the diluted antifoam to the gallon jug using the eyedropper or pipette, cap it and shake vigorously.
6. If the solution in the jug foams, go back to step 5 and repeat this step until little or no foam is generated by shaking the jug. Keep a record of the number of grams (mls) that are required to eliminate the foaming.
7. The number of grams (mls) of diluted antifoam required to eliminate foaming is equal to the number of parts per million (ppm) of the antifoam as supplied that must be added to the solution to be defoamed.
8. Calculate the amount of neat antifoam to be added as follows: Volume of solution to be defoamed = V (US Gallons)
   ppm of antifoam required = D
   Lbs. of antifoam required = W
   \[ W = \frac{8.32V \times D}{1,000,000} \]
   Example:
   10,000 gallons of foam solution require defoaming.
   The procedure above has determined that 150 ppm of antifoam are needed to defoam this solution.
   \[ 8.32 \times 10,000 \times 150 = 1,000,000 = 12.48 \text{ lbs.} \]
9. The amount of antifoam to be added will normally be quite small compared to volume of the solution to be defoamed. The antifoam must be uniformly mixed with the solution to be defoamed. It will aid in the achievement of this objective if the antifoam is diluted as much as is practical with water or the solution to be defoamed prior to addition to the solution containment area. The solution in the containment area must then be agitated to disperse the antifoam uniformly. One method of doing this is to use a fire pump to draft out of the containment area and discharge back into it using a water nozzle set on straight stream. Alternatively, if suitable metering equipment is available, antifoam as supplied or diluted antifoam can be metered into the solution discharge line at the proper concentration.

SUBSTANTIATION: This method illustrates the procedure for determining the amount of antifoam required.

COMMITTEE ACTION: Accept

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 27

AFFIRMATIVE: 22
NEGATIVE: 1
NOT RETURNED: 4 Hanauska, Olson, Pope, Walker

EXPLANATION OF NEGATIVE:
MERRITT: I continue to believe that keeping NFPA 11A as a separate document will be more user-friendly. High-expansion foam systems are quite different from low-expansion foam systems in their equipment design and many intended or practical areas of application.