

2009 Fall Revision Cycle

Report on Comments

A compilation of NFPA® Technical Committee Reports on Comments for the 2009 Fall Revision Cycle.

Notice of Intent to Make a Motion (NITMAM) deadline: October 23, 2009

NOTE: The proposed NFPA documents addressed in the Report on Proposals (ROP) and in this follow-up Report on Comments (ROC) will only be presented for action at the NFPA June 2010 Association Technical Meeting to be held June 7–10, 2010, at Mandalay Bay Convention Center in Las Vegas, NV, when proper Amending Motions have been submitted to the NFPA by the deadline of October 23, 2009. Documents that receive no motions will not be presented at the meeting and instead will be forwarded directly to the Standards Council for action on issuance. For more information on the rules and for up-to-date information on schedules and deadlines for processing NFPA documents, check the NFPA website (www.nfpa.org) or contact NFPA Standards Administration.



National Fire Protection Association®

1 BATTERYMARCH PARK, QUINCY, MA 02169-7471

Information on NFPA Codes and Standards Development

I. Applicable Regulations. The primary rules governing the processing of NFPA documents (codes, standards, recommended practices, and guides) are the *NFPA Regulations Governing Committee Projects (Regs)*. Other applicable rules include *NFPA Bylaws*, *NFPA Technical Meeting Convention Rules*, *NFPA Guide for the Conduct of Participants in the NFPA Standards Development Process*, and the *NFPA Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council*. Most of these rules and regulations are contained in the *NFPA Directory*. For copies of the *Directory*, contact Codes and Standards Administration at NFPA Headquarters; all these documents are also available on the NFPA website at “www.nfpa.org.”

The following is general information on the NFPA process. All participants, however, should refer to the actual rules and regulations for a full understanding of this process and for the criteria that govern participation.

II. Technical Committee Report. The Technical Committee Report is defined as “the Report of the Technical Committee and Technical Correlating Committee (if any) on a document. A Technical Committee Report consists of the Report on Proposals (ROP), as modified by the Report on Comments (ROC), published by the Association.”

III. Step 1: Report on Proposals (ROP). The ROP is defined as “a report to the Association on the actions taken by Technical Committees and/or Technical Correlating Committees, accompanied by a ballot statement and one or more proposals on text for a new document or to amend an existing document.” Any objection to an action in the ROP must be raised through the filing of an appropriate Comment for consideration in the ROC or the objection will be considered resolved.

IV. Step 2: Report on Comments (ROC). The ROC is defined as “a report to the Association on the actions taken by Technical Committees and/or Technical Correlating Committees accompanied by a ballot statement and one or more comments resulting from public review of the Report on Proposals (ROP).” The ROP and the ROC together constitute the Technical Committee Report. Any outstanding objection following the ROC must be raised through an appropriate Amending Motion at the Association Technical Meeting or the objection will be considered resolved.

V. Step 3a: Action at Association Technical Meeting. Following the publication of the ROC, there is a period during which those wishing to make proper Amending Motions on the Technical Committee Reports must signal their intention by submitting a Notice of Intent to Make a Motion. Documents that receive notice of proper Amending Motions (Certified Amending Motions) will be presented for action at the annual June Association Technical Meeting. At the meeting, the NFPA membership can consider and act on these Certified Amending Motions as well as Follow-up Amending Motions, that is, motions that become necessary as a result of a previous successful Amending Motion. (See 4.6.2 through 4.6.9 of *Regs* for a summary of the available Amending Motions and who may make them.) Any outstanding objection following action at an Association Technical Meeting (and any further Technical Committee consideration following successful Amending Motions, see *Regs* at 4.7) must be raised through an appeal to the Standards Council or it will be considered to be resolved.

VI. Step 3b: Documents Forwarded Directly to the Council. Where no Notice of Intent to Make a Motion (NITMAM) is received and certified in accordance with the Technical Meeting Convention Rules, the document is forwarded directly to the Standards Council for action on issuance. Objections are deemed to be resolved for these documents.

VII. Step 4a: Council Appeals. Anyone can appeal to the Standards Council concerning procedural or substantive matters related to the development, content, or issuance of any document of the Association or on matters within the purview of the authority of the Council, as established by the *Bylaws* and as determined by the Board of Directors. Such appeals must be in written form and filed with the Secretary of the Standards Council (see 1.6 of *Regs*). Time constraints for filing an appeal must be in accordance with 1.6.2 of the *Regs*. Objections are deemed to be resolved if not pursued at this level.

VIII. Step 4b: Document Issuance. The Standards Council is the issuer of all documents (see Article 8 of *Bylaws*). The Council acts on the issuance of a document presented for action at an Association Technical Meeting within 75 days from the date of the recommendation from the Association Technical Meeting, unless this period is extended by the Council (see 4.8 of *Regs*). For documents forwarded directly to the Standards Council, the Council acts on the issuance of the document at its next scheduled meeting, or at such other meeting as the Council may determine (see 4.5.6 and 4.8 of *Regs*).

IX. Petitions to the Board of Directors. The Standards Council has been delegated the responsibility for the administration of the codes and standards development process and the issuance of documents. However, where extraordinary circumstances requiring the intervention of the Board of Directors exist, the Board of Directors may take any action necessary to fulfill its obligations to preserve the integrity of the codes and standards development process and to protect the interests of the Association. The rules for petitioning the Board of Directors can be found in the *Regulations Governing Petitions to the Board of Directors from Decisions of the Standards Council* and in 1.7 of the *Regs*.

X. For More Information. The program for the Association Technical Meeting (as well as the NFPA website as information becomes available) should be consulted for the date on which each report scheduled for consideration at the meeting will be presented. For copies of the ROP and ROC as well as more information on NFPA rules and for up-to-date information on schedules and deadlines for processing NFPA documents, check the NFPA website (www.nfpa.org) or contact NFPA Codes & Standards Administration at 617-984-7246.

2009 Fall Revision Cycle ROC Contents

by NFPA Numerical Designation

Note: Documents appear in numerical order.

NFPA No.	Type Action	Title	Page No.
10	P	Standard for Portable Fire Extinguishers	10-1
11	P	Standard for Low-, Medium-, and High-Expansion Foam	11-1
13E	P	Recommended Practice for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems	13E-1
14	P	Standard for the Installation of Standpipe and Hose Systems	14-1
18	P	Standard on Wetting Agents	18-1
37	P	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	37-1
45	P	Standard on Fire Protection for Laboratories Using Chemicals	45-1
53	P	Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres	53-1
70B	P	Recommended Practice for Electrical Equipment Maintenance	70B-1
91	P	Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids	91-1
120	P	Standard for Fire Prevention and Control in Coal Mines	120-1
122	P	Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities	122-1
211	P	Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances	211-1
214	P	Standard on Water-Cooling Towers	214-1
276	N	Standard Method of Fire Tests for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components	276-1
326	P	Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair	326-1
329	P	Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases	329-1
405	P	Standard for the Recurring Proficiency of Airport Fire Fighters	405-1
408	P	Standard for Aircraft Hand Portable Fire Extinguishers	408-1
409	P	Standard on Aircraft Hangars	409-1
495	P	Explosive Materials Code	495-1
505	P	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations	505-1
551	P	Guide for the Evaluation of Fire Risk Assessments	551-1
701	P	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films	701-1
750	P	Standard on Water Mist Fire Protection Systems	750-1
804	P	Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants	804-1
805	P	Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants	805-1
806	N	Performance-Based Standard for Fire Protection for Advanced Nuclear Reactor Electric Generating Plants Change Process	806-1
850	P	Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations	850-1

851	P	Recommended Practice for Fire Protection for Hydroelectric Generating Plants	851-1
853	P	Standard for the Installation of Stationary Fuel Cell Power Systems	853-1
914	P	Code for Fire Protection of Historic Structures	914-1
1003	P	Standard for Airport Fire Fighter Professional Qualifications	1003-1
1035	P	Standard for Professional Qualifications for Public Fire and Life Safety Educator	1035-1
1150	P	Standard on Foam Chemicals for Fires in Class A Fuels	1150-1
1407	N	Standard for Fire Service Rapid Intervention Crews	1407-1
1452	P	Guide for Training Fire Service Personnel to Conduct Dwelling Fire Safety Surveys	1452-1
1581	P	Standard on Fire Department Infection Control Program	1581-1
1600	C	Standard on Disaster/Emergency Management and Business Continuity Programs.....	1600-1
1801	N	Standard on Thermal Imagers for the Fire Service.....	1801-1
1952	N	Standard on Surface Water Operations Protective Clothing and Equipment.....	1952-1
2010	P	Standard for Fixed Aerosol Fire-Extinguishing Systems	2010-1

**2009 Fall Cycle ROC
Committees Reporting**

	Type Action	Page No.
Aircraft Rescue and Fire Fighting		
405 Standard for the Recurring Proficiency of Airport Fire Fighters	P	405-1
408 Standard for Aircraft Hand Portable Fire Extinguishers	P	408-1
Airport Facilities		
409 Standard on Aircraft Hangars	P	409-1
Chimneys, Fireplaces, and Venting Systems for Heat-Producing Appliances		
211 Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances	P	211-1
Cultural Resources		
914 Code for Fire Protection of Historic Structures	P	914-1
Electric Generating Plants		
850 Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations	P	850-1
851 Recommended Practice for Fire Protection for Hydroelectric Generating Plants	P	851-1
853 Standard for the Installation of Stationary Fuel Cell Power Systems	P	853-1
Electrical Equipment Maintenance		
70B Recommended Practice for Electrical Equipment Maintenance	P	70B-1
Emergency Management and Business Continuity		
1600 Standard on Disaster/Emergency Management Business Continuity Programs	C	1600-1
Explosives		
495 Explosive Materials Code	P	495-1
Fire and Emergency Services Protective Clothing and Equipment		
Electronic Safety Equipment		
1801 Standard on Thermal Imagers for the Fire Service	N	1801-1
Special Operations Protective Clothing and Equipment		
1952 Standard on Surface Water Operations Protective Clothing and Equipment	N	1952-1
Fire Protection for Nuclear Facilities		
804 Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants	P	804-1
805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants	P	805-1
806 Performance-Based Standard for Fire Protection for Advanced Nuclear Reactor Electric Generating Plants Change Process	N	806-1
Fire Risk Assessment Methods		
551 Guide for the Evaluation of Fire Risk Assessments	P	551-1
Fire Service Occupational Safety and Health		
1581 Standard on Fire Department Infection Control Program	P	1581-1
Fire Service Training		
13E Recommended Practice for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems	P	13E-1
1407 Standard for Fire Service Rapid Intervention Crews	N	1407-1
1452 Guide for Training Fire Service Personnel to Conduct Dwelling Fire Safety Surveys	P	1452-1
Fire Tests		
276 Standard Method of Fire Tests for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components	N	276-1
701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films	P	701-1
Foam		
11 Standard for Low-, Medium-, and High-Expansion Foam	P	11-1
Forest and Rural Fire Protection		
1150 Standard on Foam Chemicals for Fires in Class A Fuels	P	1150-1

Handling and Conveying of Dusts, Vapors, and Gases			
91	Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids	P	91-1
Industrial Trucks			
505	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations	P	505-1
Internal Combustion Engines			
37	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	P	37-1
Laboratories Using Chemicals			
45	Standard on Fire Protection for Laboratories Using Chemicals	P	45-1
Mining Facilities			
120	Standard for Fire Prevention and Control in Coal Mines	P	120-1
122	Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities	P	122-1
Oxygen-Enriched Atmospheres			
53	Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres	P	53-1
Portable Fire Extinguishers			
10	Standard for Portable Fire Extinguishers	P	10-1
Professional Qualifications			
Fire Fighter Professional Qualifications			
1003	Standard for Airport Fire Fighter Professional Qualifications	P	1003-1
Public Fire Educator Professional Qualifications			
1035	Standard for Professional Qualifications for Public Fire and Life Safety Educator	P	1035-1
Standpipes			
14	Standard for the Installation of Standpipe and Hose Systems	P	14-1
Tank Leakage and Repair Safeguards			
326	Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair	P	326-1
329	Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases	P	329-1
Water Additives for Fire Control and Vapor Mitigation			
18	Standard on Wetting Agents	P	18-1
Water-Cooling Towers			
214	Standard on Water-Cooling Towers	P	214-1
Water Mist Fire Suppression Systems			
750	Standard on Water Mist Fire Protection Systems	P	750-1

Documents Without Comments

The documents listed below appeared in the 2009 Fall Revision Cycle *Report on Proposals* but did not receive comments. Therefore, no reports of these documents appear in this *Report on Comments*.

255	W	<i>Standard Method of Test of Surface Burning Characteristics of Building Materials</i>
410	P	<i>Standard on Aircraft Maintenance</i>
422	P	<i>Guide for Aircraft Accident/Incident Response Assessment</i>
423	P	<i>Standard for Construction and Protection of Aircraft Engine Test Facilities</i>
498	R	<i>Standard for Safe Havens and Interchange Lots for Vehicles Transporting Explosives</i>
520	P	<i>Standard on Subterranean Spaces</i>
600	R	<i>Standard on Industrial Fire Brigades</i>
601	R	<i>Standard for Security Services in Fire Loss Prevention</i>
900	P	<i>Building Energy Code</i>
1201	C	<i>Standard for Providing Emergency Services to the Public</i> (will be redesignated as NFPA 1201, <i>Standard for Providing Fire and Emergency Services to the Public</i>)
1250	P	<i>Recommended Practice in Emergency Service Organization Risk Management</i> (will be redesignated as NFPA 1250, <i>Recommended Practice in Fire and Emergency Services Organization Risk Management</i>)
1410	P	<i>Standard on Training for Initial Emergency Scene Operations</i>
1620	C	<i>Recommended Practice for Pre-Incident Planning</i> (will be redesignated as NFPA 1620, <i>Standard for Pre-Incident Planning</i>)
1931	P	<i>Standard for Manufacturer's Design of Fire Department Ground Ladders</i>
1932	P	<i>Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders</i>
1936	P	<i>Standard on Powered Rescue Tools</i>

The following documents changed reporting cycles as indicated below:

NFPA 204

The Technical Committee Report on NFPA 204, *Standard for Smoke and Heat Venting*, is not included in this *Report on Comments* for action at this meeting. The Committee has requested more time to develop a position on the design issues involving sprinklers in buildings equipped with smoke and heat vents. The document will instead report in the *Report on Comments* for the A2010 ROC cycle.

NFPA 1977

The Technical Committee Report on NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*, is not included in this *Report on Comments* for action at this meeting. The Committee has requested more time because of new material submitted during the F2009 ROC. The document will instead report in the *Report on Proposals* for the F2010 ROP cycle, but will not reopen the proposal closing date.

**FORM FOR FILING NOTICE OF INTENT TO MAKE A MOTION (NITMAM)
AT AN ASSOCIATION TECHNICAL MEETING
2009 FALL REVISION CYCLE
FINAL DATE FOR RECEIPT OF NITMAM: 5:00 pm EDST, October 23, 2009**

If you have questions about filling out or filing the NITMAM, please contact the Codes and Standards Administration at 617-984-7249

For further information on the Codes- and Standards-Making Process see the NFPA website (www.nfpa.org)

FOR OFFICE USE ONLY

Log #: _____

Date Rec'd: _____

Date 8/10/2005 Name John B. Smith Tel. No. 617-555-1212

Company or Affiliation John B. Smith Consulting Email Address _____

Street Address 9 Seattle Street City Seattle State WA Zip 02255

1. (a) NFPA Document (include Number and Title) National Fire Alarm Code/NFPA 72 1999ed
(b) Proposal or Comment Number 72-5
(c) Section/Paragraph 1.5.8.1

2. Motion to be made. Please check one (See also 4.6 of the Regulations Governing Committee Projects):

(a) Proposal

- (1) Accept. _____ (2) Accept an Identifiable Part.*
_____ (3) Accept as modified by the TC. _____ (4) Accept an Identifiable Part as modified by TC.*

(b) Comment

- _____ (1) Accept. _____ (2) Accept an Identifiable Part. * _____ (3) Accept as modified by the TC.
_____ (4) Accept an Identifiable Part as modified by TC.* _____ (5) Reject _____ (6) Reject an Identifiable Part.*

(c) Return Technical Committee Report for Further Study

- _____ (1) Return entire Report. _____ (2) Return a portion of a Report in the form of a proposal and related comment(s).
_____ (3) Return a portion of a Report in the form of identifiable part(s) of a proposal and related comments(s). (Identify the specific portion of the proposal and the related comments below)*

* Clearly identify the Identifiable Part(s) indicated above (use separate sheet if required).

3. I am entitled to make this motion in accordance with 4.6.8 of the Regulations Governing Committee Projects, as follows [check (a), (b), or (c)]:

(a) This motion may be made by the original submitter or their designated representative, and I am the [if you check (a) indicate one of the following]:

- I am the original submitter of the proposal or comment, or
 I am the submitter's designated representative (attach written authorization signed by the original submitter)

(b) This motion may be made by a Technical Committee Member and I am a Member of the responsible Technical Committee.

(c) This motion may be made by anyone.

(Form continued on next page)

**FORM FOR FILING NOTICE OF INTENT TO MAKE A MOTION (NITMAM)
AT AN ASSOCIATION TECHNICAL MEETING
2009 FALL REVISION CYCLE**

FINAL DATE FOR RECEIPT OF NITMAM: 5:00 pm EDST, October 23, 2009

If you have questions about filling out or filing the NITMAM, please contact the
Codes and Standards Administration at 617-984-7249

For further information on the Codes- and Standards-Making Process, see the NFPA
website (www.nfpa.org)

FOR OFFICE USE ONLY

Log #: _____

Date Rec'd: _____

Date _____ Name _____ Tel. No. _____

Company or Affiliation _____ Email Address _____

Street Address _____ City _____ State _____ Zip _____

1. (a) NFPA Document (include Number and Title) _____
(b) Proposal or Comment Number _____
(c) Section/Paragraph _____

2. Motion to be made. Please check one: (See also 4.6 of the Regulations Governing Committee Projects)

(a) Proposal

- _____ (1) Accept. _____ (2) Accept an Identifiable Part.*
_____ (3) Accept as modified by the TC. _____ (4) Accept an Identifiable Part as modified by TC.*

(b) Comment

- _____ (1) Accept. _____ (2) Accept an Identifiable Part.* _____ (3) Accept as modified by the TC.
_____ (4) Accept an Identifiable Part as modified by TC.* _____ (5) Reject _____ (6) Reject an Identifiable Part.*

(c) Return Technical Committee Report for Further Study

- _____ (1) Return entire Report. _____ (2) Return a portion of a Report in the form of a proposal and related comment(s).
_____ (3) Return a portion of a Report in the form of identifiable part(s) of a proposal and related comment(s). (Identify the specific portion of the proposal and the related comments below)*

* Clearly identify the Identifiable Part(s) indicated above (use separate sheet if required).

3. I am entitled to make this motion in accordance with 4.6.8 of the Regulations Governing Committee Projects, as follows: [(check (a), (b), or (c)].

(a) _____ This motion may be made by the original submitter or their designated representative, and I am the [(if you check (a) indicate one of the following)]:

___ I am the original submitter of the proposal or comment, or

___ I am the submitter's designated representative (attach written authorization signed by the original submitter)

(b) _____ This motion may be made by a Technical Committee Member and I am a Member of the responsible Technical Committee.

(c) _____ This motion may be made by anyone.

(Form continued on next page)

Sequence of Events Leading to Issuance of an NFPA Committee Document

Step 1 Call for Proposals

▼ Proposed new document or new edition of an existing document is entered into one of two yearly revision cycles, and a Call for Proposals is published.

Step 2 Report on Proposals (ROP)

▼ Committee meets to act on Proposals, to develop its own Proposals, and to prepare its Report.

▼ Committee votes by written ballot on Proposals. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.

▼ Report on Proposals (ROP) is published for public review and comment.

Step 3 Report on Comments (ROC)

▼ Committee meets to act on Public Comments to develop its own Comments, and to prepare its report.

▼ Committee votes by written ballot on Comments. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.

▼ Report on Comments (ROC) is published for public review.

Step 4 Association Technical Meeting

▼ “*Notices of intent to make a motion*” are filed, are reviewed, and valid motions are certified for presentation at the Association Technical Meeting. (“Consent Documents” that have no certified motions bypass the Association Technical Meeting and proceed to the Standards Council for issuance.)

▼ NFPA membership meets each June at the Association Technical Meeting and acts on Technical Committee Reports (ROP and ROC) for documents with “certified amending motions.”

▼ Committee(s) vote on any amendments to Report approved at NFPA Annual Membership Meeting.

Step 5 Standards Council Issuance

▼ Notification of intent to file an appeal to the Standards Council on Association action must be filed within 20 days of the NFPA Annual Membership Meeting.

▼ Standards Council decides, based on all evidence, whether or not to issue document or to take other action, including hearing any appeals.

The Association Technical Meeting

The process of public input and review does not end with the publication of the ROP and ROC. Following the completion of the Proposal and Comment periods, there is yet a further opportunity for debate and discussion through the Association Technical Meeting that takes place at the NFPA Annual Meeting.

The Association Technical Meeting provides an opportunity for the final Technical Committee Report (i.e., the ROP and ROC) on each proposed new or revised code or standard to be presented to the NFPA membership for the debate and consideration of motions to amend the Report. The specific rules for the types of motions that can be made and who can make them are set forth in NFPA's rules, which should always be consulted by those wishing to bring an issue before the membership at an Association Technical Meeting. The following presents some of the main features of how a Report is handled.

The Filing of a Notice of Intent to Make a Motion. Before making an allowable motion at an Association Technical Meeting, the intended maker of the motion must file, in advance of the session, and within the published deadline, a Notice of Intent to Make a Motion. A Motions Committee appointed by the Standards Council then reviews all notices and certifies all amending motions that are proper. The Motions Committee can also, in consultation with the makers of the motions, clarify the intent of the motions and, in certain circumstances, combine motions that are dependent on each other together so that they can be made in one single motion. A Motions Committee report is then made available in advance of the meeting listing all certified motions. Only these Certified Amending Motions, together with certain allowable Follow-Up Motions (that is, motions that have become necessary as a result of previous successful amending motions) will be allowed at the Association Technical Meeting.

Consent Documents. Often there are codes and standards up for consideration by the membership that will be noncontroversial and no proper Notices of Intent to Make a Motion will be filed. These "Consent Documents" will bypass the Association Technical Meeting and head straight to the Standards Council for issuance. The remaining documents are then forwarded to the Association Technical Meeting for consideration of the NFPA membership.

What Amending Motions Are Allowed. The Technical Committee Reports contain many Proposals and Comments that the Technical Committee has rejected or revised in whole or in part. Actions of the Technical Committee published in the ROP may also eventually be rejected or revised by the Technical Committee during the development of its ROC. The motions allowed by NFPA rules provide the opportunity to propose amendments to the text of a proposed code or standard based on these published Proposals, Comments, and Committee actions. Thus, the list of allowable motions include motions to accept Proposals and Comments in whole or in part as submitted or as modified by a Technical Committee action. Motions are also available to reject an accepted Comment in whole or part. In addition, Motions can be made to return an entire Technical Committee Report or a portion of the Report to the Technical Committee for further study.

The NFPA Annual Meeting, also known as the NFPA Conference & Expo, takes place in June of each year. A second Fall membership meeting was discontinued in 2004, so the NFPA Technical Committee Report Session now runs once each year at the Annual Meeting in June.

Who Can Make Amending Motions. NFPA rules also define those authorized to make amending motions. In many cases, the maker of the motion is limited by NFPA rules to the original submitter of the Proposal or Comment or his or her duly authorized representative. In other cases, such as a Motion to Reject an accepted Comment, or to Return a Technical Committee Report or a portion of a Technical Committee Report for Further Study, anyone can make these motions. For a complete explanation, the NFPA Regs should be consulted.

Action on Motions at the Association Technical Meeting. In order to actually make a Certified Amending Motion at the Association Technical Meeting, the maker of the motion must sign in at least an hour before the session begins. In this way a final list of motions can be set in advance of the session. At the session, each proposed document up for consideration is presented by a motion to adopt the Technical Committee Report on the document. Following each such motion, the presiding officer in charge of the session opens the floor to motions on the document from the final list of Certified Amending Motions followed by any permissible Follow-Up Motions. Debate and voting on each motion proceeds in accordance with NFPA rules. NFPA membership is not required in order to make or speak to a motion, but voting is limited to NFPA members who have joined at least 180 days prior to the Association Technical Meeting and have registered for the meeting. At the close of debate on each motion, voting takes place, and the motion requires a majority vote to carry. In order to amend a Technical Committee Report, successful amending motions must be confirmed by the responsible Technical Committee, which conducts a written ballot on all successful amending motions following the meeting and prior to the document being forwarded to the Standards Council for issuance.

Standards Council Issuance

One of the primary responsibilities of the NFPA Standards Council, as the overseer of the NFPA codes and standards development process, is to act as the official issuer of all NFPA codes and standards. When it convenes to issue NFPA documents, it also hears any appeals related to the document. Appeals are an important part of assuring that all NFPA rules have been followed and that due process and fairness have been upheld throughout the codes and standards development process. The Council considers appeals both in writing and through the conduct of hearings at which all interested parties can participate. It decides appeals based on the entire record of the process as well as all submissions on the appeal. After deciding all appeals related to a document before it, the Council, if appropriate, proceeds to issue the document as an official NFPA code or standard. Subject only to limited review by the NFPA Board of Directors, the decision of the Standards Council is final, and the new NFPA code or standard becomes effective twenty days after Standards Council issuance.

Key to Comment Headings

The first line of every proposal includes the following information:

Document No.	Proposal No.	Log No.	Paragraph Reference	Committee Action
101	6	38	3.4	Accept

Example: 101-6 Log #38 **Final Action: Accept (3.4)**

TYPES OF ACTION

P Partial Revision **C** Complete Revision **N** New Document **R** Reconfirmation **W** Withdrawal

The following classifications apply to Committee members and represent their principal interest in the activity of the Committee.

1. M Manufacturer: A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.
2. U User: A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.
3. IM Installer/Maintainer: A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.
4. L Labor: A labor representative or employee concerned with safety in the workplace.
5. RT Applied Research/Testing Laboratory: A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.
6. E Enforcing Authority: A representative of an agency or an organization that promulgates and/or enforces standards.
7. I Insurance: A representative of an insurance company, broker, agent, bureau, or inspection agency.
8. C Consumer: A person who is or represents the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in (2).
9. SE Special Expert: A person not representing (1) through (8) and who has special expertise in the scope of the standard or portion thereof.

NOTE 1: "Standard" connotes code, standard, recommended practice, or guide.

NOTE 2: A representative includes an employee.

NOTE 3: While these classifications will be used by the Standards Council to achieve a balance for Technical Committees, the Standards Council may determine that new classifications of member or unique interests need representation in order to foster the best possible Committee deliberations on any project. In this connection, the Standards Council may make such appointments as it deems appropriate in the public interest, such as the classification of "Utilities" in the National Electrical Code Committee.

NOTE 4: Representatives of subsidiaries of any group are generally considered to have the same classification as the parent organization.

Report of the Committee on**Foam****Fay Purvis, Chair**

Vector Fire Technology, Inc., PA [SE]

Joan M. Leedy, Secretary

Dyne Technologies, MN [IM]

Jean-Pierre Asselin, FireFlex Systems, Inc., Canada [M]
V. Frank Bateman, Kidde Fire Fighting, CA [M]
Gene E. Benzenberg, Alison Control Inc., NJ [M]
Robert A. Green, Public Service Electric & Gas Company, NJ [U]
 Rep. Edison Electric Institute
Christopher P. Hanauska, Hughes Associates, Inc., MN [SE]
Randall Hendricksen, ChemGuard, Inc., TX [M]
Robert Kasiski, FM Global, MA [I]
Eric LaVergne, Williams Fire and Hazard Control, TX [M]
Ronald J. Mahlman, The RJA Group, Inc., CA [SE]
Edward C. Norman, Aqueous Foam Technology, Inc., PA [SE]
Keith Olson, Tyco Suppression Systems, WI [M]
David W. Owen, ExxonMobil Corporation, VA [U]
 Rep. American Petroleum Institute
Niall Ramsden, Resource Protection International, United Kingdom [SE]
Lynn A. Rawls, XL Global Asset Protection Services, MS [I]
Gaston J. Santerre, Integrated Protection Services Inc., CA [IM]
 Rep. American Fire Sprinkler Association
Blake M. Shugarman, Underwriters Laboratories Inc., IL [RT]
Orville M. Slye, Jr., Loss Control Associates, Inc., PA [SE]
John A. Toney, Dooley Tackaberry, Inc., TX [IM]
 Rep. National Association of Fire Equipment Distributors
Howard L. Vandersall, Lawdon Fire Services, Inc., CA [SE]
Kevin D. Westwood, BP International, United Kingdom [U]
Michel Williams, Ultramar Canada, Ltd., Canada [U]
 Rep. NFPA Industrial Fire Protection Section
Martin H. Workman, The Viking Corporation, MI [M]

Alternates

Armand V. Brandao, FM Approvals, MA [I]
 (Alt. to Robert Kasiski)
Randall Eberly, US Coast Guard, DC [E]
 (Voting Alt. to USCG Rep.)
Scott E. Herreth, Dooley Tackaberry, Inc., TX [IM]
 (Alt. to John A. Toney)

Mitchell Hubert, Tyco International/Ansul Inc., WI [M]
 (Alt. to Keith Olson)
William E. Janz, XL Global Asset Protection Services, IL [I]
 (Alt. to Lynn A. Rawls)
George E. Laverick, Underwriters Laboratories Inc., IL [RT]
 (Alt. to Blake M. Shugarman)
Raymond Quenneville, FireFlex Systems, Inc., Canada [M]
 (Alt. to Jean-Pierre Asselin)
Joseph L. Scheffey, Hughes Associates, Inc., MD [SE]
 (Alt. to Christopher P. Hanauska)
Donald H. Seaman, CSC Advanced Marine, DC [SE]
 (Voting Alt. to CSC Rep.)
Clark D. Shepard, ExxonMobil Corporation, VA [U]
 (Alt. to David W. Owen)
David M. Sornsins, Nardini Fire Equipment Company, Inc., ND [IM]
 (Alt. to Gaston J. Santerre)
John R. Stauder, The RJA Group, Inc., CA [SE]
 (Alt. to Ronald J. Mahlman)

Nonvoting

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

Staff Liaison: **Timothy A. Hawthorne**

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 balloted 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.

This portion of the Technical Committee Report of the Committee on **Foam** is presented for adoption.

This Report on Comments was prepared by the **Technical Committee on Foam**, and documents its action on the comments received on its Report on Proposals on NFPA 11, **Standard for Low-, Medium-, and High-Expansion Foam**, 2005 edition, as published in the Report on Proposals for the 2009 Fall Revision Cycle.

This Report on Comments has been submitted to letter ballot of the **Technical Committee on Foam**, which consists of 26 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

11-1 Log #CC2
(4.3.2.3.3, A.4.3.2.3.3)

Final Action: Accept

Submitter: Technical Committee on Foam,
Comment on Proposal No: 11-15

Recommendation: Add a new Section 4.3.2.3.3 and Annex A4.3.2.3.3 material as shown:

4.3.2.3.3* Proportioning systems shall have signage to provide instruction on the proper sequence of system shut down to prevent accidental loss of foam concentrate and or system damage

A.4.3.2.3.3 Some foam proportioning systems can have an inherent problem related to loss of foam concentrate and/or damage to bladder tanks or foam pumps if not shut down properly following system activation. There are two scenarios that can occur depending on the proportioning system arrangement. Bladder tank proportioning systems with the water feed line to the bladder tank(s) connected below the foam riser manual shutoff(OS&Y) can be vulnerable depending on the system shut down procedure followed. When the riser shut off valve is closed first foam concentrate continues to flow into the depressurized riser through the proportioner foam metering orifice. If this condition continues, all foam concentrate in the bladder tank will be forced into the riser and foam solution distribution piping. In Line Balanced Pressure or Balanced Pressure foam pump type proportioning systems can also experience a similar loss of foam concentrate depending on the system installation arrangement. If the water supply (riser OS&Y valve is located before (upstream) the foam proportioner with the foam pump still running the same potential for foam concentrate loss exists. When the water supply (riser OS&Y) valve is closed the foam proportioner is no longer pressurized and foam concentrate will be forced through the proportioner and metering orifice into the riser. If allowed to continue, this condition will deplete the foam tank and possibly cause harm to the foam pump by running in a “dry” condition. Close the foam concentrate supply valve before shutting off the water supply valve to prevent loss of concentrate. In the case of a pump type system it will allow foam to re-circulate back to the foam tank until the foam pump is shut off. Alternatively, in the case of bladder tank systems the water feed valve to the tank(s) could be closed and this would stop the foam injection process

Substantiation: This will help prevent the foam in pressurized tanks from leaking out of the systems when the pressure on the outlet piping is released.
Committee Meeting Action: Accept
Number Eligible to Vote: 26
Ballot Results: Affirmative: 17
Ballot Not Returned: 9 LaVergne, E., Leedy, J., Owen, D., Santerre, G., Slye, Jr., O., Vandersall, H., Westwood, K., Williams, M., Workman, M.

Comment on Affirmative:

BATEMAN, V.: General Clarification labelling can be made on manufacturers equipment however detailed instructions NEED to be provided by the installing contractor to cover final installed designs. Equipment providers cannot be responsible for custom installations.

11-2 Log #CC1
(Annex F)

Final Action: Accept

Submitter: Technical Committee on Foam,
Comment on Proposal No: 11-2

Recommendation: Revise text to read as follows:

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

F.1 Overview.

Fire-fighting foams as addressed in this standard serve a vital role in fire protection throughout the world. Their use has proven to be essential for the control of flammable liquid fire threats inherent in airport operations, fuel farms and petroleum processing, highway and rail transportation, marine applications, and industrial facilities. The ability of foam to rapidly extinguish flammable liquid spill fires has undoubtedly saved lives, reduced property loss, and helped minimize the global pollution that can result from the uncontrolled burning of flammable fuels, solvents, and industrial liquids.

However, with the ever-increasing environmental awareness, recent concern has focused on the potential adverse environmental impact of foam solution discharges. The primary concerns are toxicity, biodegradability, persistence, treatability in wastewater treatment plants, and nutrient loading. All of these are of concern when the end-use foam solutions reach natural or domestic water systems.

The purpose of this annex is to address the following:

- (1) Provide foam users with summary information on foam environmental issues
- (2) Highlight applicable regulatory status
- (3) Offer guidelines for coping with regulations, and provide suggested sources for additional information

(4) Encourage planning for foam discharge scenarios (including prior contact with local wastewater treatment plant operators)

It should be emphasized that it is not the intent of this annex to limit or restrict the use of fire-fighting foams. The foam committee believes that the fire safety advantages of using foam are greater than the risks of potential environmental problems. The ultimate goal of this section is to foster use of foam in an environmentally responsible manner so as to minimize risk from its use.

F.2 Scope.

The information provided in this section covers foams for Class B combustible and flammable liquid fuel fires. Foams for this purpose include protein foam, fluoroprotein foam, film-forming fluoroprotein foam (FFFP), and synthetic foams such as aqueous film-forming foam (AFFF). This section is primarily concerned with the discharge of foam solutions to wastewater treatment facilities and to the environment. The discharge of foam concentrates, while a related subject, is a much less common occurrence. All manufacturers of foam concentrate deal with clean-up and disposal of spilled concentrate in their MSDS sheets and product literature.

F.3 Discharge Scenarios.

A discharge of foam water solution is most likely to be the result of one of four scenarios:

- (1) Manual fire-fighting or fuel-blanketing operations
- (2) Training
- (3) Foam equipment system tests
- (4) Fixed system releases

These four scenarios include events occurring at such places as aircraft facilities, fire fighter training facilities, and special hazards facilities (such as flammable/hazardous warehouses, bulk flammable liquid storage facilities, and hazardous waste storage facilities). Each scenario is considered separately in F.3.1 through F.3.4.

F.3.1 Fire-Fighting Operations. Fires occur in many types of locations and under many different circumstances. In some cases, it is possible to collect the foam solution used; and in others, such as in marine fire fighting, it is not. These types of incidents include aircraft rescue and fire-fighting operations, vehicular fires (i.e., cars, boats, train cars), structural fires with hazardous materials, and flammable liquid fires. Foam water solution that has been used in fire-fighting operations will probably be heavily contaminated with the fuel or fuels involved in the fire. It is also likely to have been diluted with water discharged for cooling purposes.

In some cases, the foam solution used during fire department operations can be collected. However, it is not always possible to control or contain the foam. This can be a consequence of the location of the incident or the circumstances surrounding it.

Event-initiated manual containment measures are the operations usually executed by the responding fire department to contain the flow of foam water solution when conditions and manpower permit. Those operations include the following measures:

- (1) Blocking sewer drains: this is a common practice used to prevent contaminated foam water solution from entering the sewer system unchecked. It is then diverted to an area suitable for containment.
- (2) Portable dikes: these are generally used for land-based operations. They can be set up by the fire department personnel during or after extinguishment to collect run-off.
- (3) Portable booms: these are used for marine-based operations, which are set up to contain foam in a defined area. These generally involve the use of floating booms within a natural body of water.

F.3.2 Training. Training is normally conducted under circumstances conducive to the collection of spent foam. Some fire training facilities have had elaborate systems designed and constructed to collect foam solution, separate it from the fuel, treat it, and — in some cases — re-use the treated water. At a minimum, most fire training facilities collect the foam solution for discharge to a wastewater treatment facility. Training can include the use of special training foams or actual fire-fighting foams. Training facility design should include a containment system. The wastewater treatment facility should first be notified and should give permission for the agent to be released at a prescribed rate.

F.3.3 System Tests. Testing primarily involves engineered, fixed foam fire-extinguishing systems. Two types of tests are conducted on foam systems: acceptance tests, conducted pursuant to installation of the system; and maintenance tests, usually conducted annually to ensure the operability of the system. These tests can be arranged to pose no hazard to the environment. It is possible to test some systems using water or other nonfoaming, environmentally acceptable liquids in the place of foam concentrates if the AHJ permits such substitutions.

In the execution of both acceptance and maintenance tests, only a small amount of foam concentrate should be discharged to verify the correct concentration of foam in the foam water solution. Designated foam water test ports can be designed into the piping system so that the discharge of foam water solution can be directed to a controlled location. The controlled location can consist of a portable tank that would be transported to an approved disposal site by a licensed contractor. The remainder of the acceptance test and maintenance test should be conducted using only water.

F.3.4 Fixed System Releases. This type of release is generally uncontrolled, whether the result of a fire incident or a malfunction in the system. The foam solution discharge in this type of scenario can be dealt with by event-initiated operations or by engineered containment systems. Event-initiated operations encompass the same temporary measures that would be taken during fire department operations: portable dikes, floating booms, and so forth. Engineered containment would be based mainly on the location and type of facility, and would consist of holding tanks or areas where the contaminated foam water solution would be collected, treated, and sent to a wastewater treatment facility at a prescribed rate.

F.4 Fixed Systems.

Facilities can be divided into those without an engineered containment system and those with an engineered containment system.

F.4.1 Facilities without Engineered Containment. Given the absence of any past requirements to provide containment, many existing facilities simply allow the foam water solution to flow out of the building and evaporate into the atmosphere or percolate into the ground. The choices for containment of foam water solution at such facilities fall into two categories: event-initiated manual containment measures and installation of engineered containment systems.

Selection of the appropriate choice is dependent on the location of the facility, the risk to the environment, the risk of an automatic system discharge, the frequency of automatic system discharges, and any applicable rules or regulations.

“Event-initiated manual containment measures” will be the most likely course of action for existing facilities without engineered containment systems. This can fall under the responsibility of the responding fire department and include such measures as blocking storm sewers, constructing temporary dikes, and deploying floating booms. The degree of such measures will primarily be dictated by location as well as available resources and manpower.

The “installation of engineered containment systems” is a possible choice for existing facilities. Retrofitting an engineered containment system is costly and can adversely affect facility operations. There are special cases, however, that can warrant the design and installation of such systems. Such action is a consideration where an existing facility is immediately adjacent to a natural body of water and has a high frequency of activation.

F.4.2 Facilities with Engineered Containment. Any engineered containment system will usually incorporate an oil/water separator. During normal drainage conditions (i.e., no foam solution runoff), the separator functions to remove any fuel particles from drainage water. However, when foam water solution is flowing, the oil/water separator must be bypassed so that the solution is diverted directly to storage tanks. This can be accomplished automatically by the installation of motorized valves set to open the bypass line upon activation of the fixed fire-extinguishing systems at the protected property.

The size of the containment system is dependent on the duration of the foam water flow, the flow rate, and the maximum anticipated rainfall in a 24-hour period. Most new containment systems will probably only accommodate individual buildings. However, some containment systems can be designed to accommodate multiple buildings, depending upon the topography of the land and early identification in the overall site planning process.

The specific type of containment system selected will also depend upon location, desired capacity, and function of facilities in question. The systems include earthen retention systems, belowground tanks, open-top inground tanks, and sump and pump designs (i.e., lift stations) piped to aboveground or inground tanks.

The earthen retention designs consist of open-top earthen berms, which usually rely upon gravity-fed drainage piping from the protected building. They can simply allow the foam water solution to percolate into the ground or can include an impermeable liner. Those containing an impermeable liner can be connected to a wastewater treatment facility or can be suction pumped out by a licensed contractor.

Closed-top, belowground storage tanks can be the least environmentally acceptable design approach. They usually consist of a gravity-fed piping arrangement and can be suction pumped out or piped to a wastewater treatment facility. A potential and frequent problem associated with this design is the leakage of groundwater or unknown liquids into the storage tank.

Open-top, belowground storage tanks are usually lined concrete tanks that can rely on gravity-fed drainage piping or a sump and pump arrangement. These can accommodate individual or multiple buildings. They must also accommodate the maximum anticipated rainfall in a 24-hour period. These are usually piped to a wastewater treatment facility.

Aboveground tanks incorporate a sump and pump arrangement to closed, aboveground tanks. Such designs usually incorporate the use of one or more submersible or vertical shaft, large-capacity pumps. These can accommodate individual or multiple buildings.

F.4.3 New Facilities. The decision to design and install a fixed foam water solution containment system is dependent on the location of the facility, the risk to the environment, possible impairment of facility operations, the design of the fixed foam system (i.e., automatically or manually activated), the ability of the responding fire department to execute event-initiated containment measures, and any pertinent regulations.

New facilities might not warrant the expense and problems associated with

containment systems. Where the location of a facility does not endanger groundwater or any natural bodies of water, this can be an acceptable choice, provided the fire department has planned emergency manual containment measures.

Where conditions warrant the installation of engineered containment systems, there are a number of considerations. They include size of containment, design and type of containment system, and the capability of the containment system to handle individual or multiple buildings. Engineered containment systems can be a recommended protective measure where foam extinguishing systems are installed in facilities that are immediately adjacent to a natural body of water. These systems can also be prudent at new facilities, where site conditions permit, to avoid impairment of facility operations.

F.5 Disposal Alternatives.

The uncontrolled release of foam solutions to the environment should be avoided. Alternative disposal options are as follows:

- (1) Discharge to a wastewater treatment plant with or without pretreatment
- (2) Discharge to the environment after pretreatment
- (3) Solar evaporation
- (4) Transportation to a wastewater treatment plant or hazardous waste facility

Foam users, as part of their planning process, should make provisions to take the actions necessary to utilize whichever of these alternatives is appropriate for their situation. Section F.6 describes the actions that can be taken, depending on the disposal alternative that is chosen.

F.6 Collection and Pretreatment of Foam Solutions Prior to Disposal.

F.6.1 Collection and Containment. The essential first step in employing any of these alternatives is collection of the foam solution. As noted above, facilities that are protected by foam systems normally have systems to collect and hold fuel spills. These systems can also be used to collect and hold foam solution. Training facilities are, in general, designed so that foam solution can be collected and held. Fire fighters responding to fires that are at other locations should attempt, insofar as is practical, to collect foam solution run-off with temporary dikes or other means.

F.6.2 Fuel Separation. Foam solution that has been discharged on a fire and subsequently collected will usually be heavily contaminated with fuel. Since most fuels present their own environmental hazards and will interfere with foam solution pretreatment, an attempt should be made to separate as much fuel as possible from the foam solution. As noted in F.4.2, the tendency of foam solutions to form emulsions with hydrocarbon fuels will interfere with the operation of conventional fuel-water separators. An alternative is to hold the collected foam solution in a pond or lagoon until the emulsion breaks and the fuel can be separated by skimming. This can take from several hours to several days. During this time, agitation should be avoided to prevent the emulsion from reforming.

F.6.3 Pretreatment Prior to Discharge.

F.6.3.1 Dilution. Foam manufacturers and foam users recommend dilution of foam solution before it enters a wastewater treatment plant. There is a range of opinion on the optimum degree of dilution. It is generally considered that the concentration of foam solution in the plant influent should not exceed 1700 ppm (588 gal of plant influent per gallon of foam solution). This degree of dilution is normally sufficient to prevent shock loading and foaming in the plant. However, each wastewater treatment plant must be considered as a special case, and those planning a discharge of foam solution to a wastewater treatment facility should discuss this subject with the operator of the facility in advance.

Diluting waste foam solution 588:1 with water is an impractical task for most facilities, especially when large quantities of foam solution are involved. The recommended procedure is to dilute the foam solution to the maximum amount practical and then meter the diluted solution into the sewer at a rate which, based on the total volume of plant influent, will produce a foam solution concentration of 1700 ppm or less.

For example, if the discharge is to be made to a 6 million gal/day treatment plant, foam solution could be discharged at the rate of 7 gpm (6,000,000 gal/day divided by 1440 minutes/day divided by 588 equals 7 gpm). The difficulties of metering such a low rate of discharge can be overcome by first diluting the foam solution by 10:1 or 20:1, permitting discharge rates of 70 gpm or 140 gpm respectively. Dilution should also be considered if the foam solution is to be discharged to the environment in order to minimize its impact.

F.6.3.2 Defoamers. The use of defoamers will decrease, but not eliminate, foaming of the foam solution during pumping, dilution, and treatment. The foam manufacturer should be consulted for recommendations as to the choice of effective defoamers for use with a particular foam concentrate.

F.6.3.3 Method for Determining the Effective Amount of Antifoam Apparatus. The effective amount of antifoam is determined by using the following apparatus:

- (1) Balance — 1600 g capacity minimum — readability 0.2 g maximum
- (2) One 2 L beaker or similar container
- (3) One 1 gal plastic or glass jug with cap
- (4) Eyedropper
- (5) Optional — 10 mL pipette

F.6.3.3.1 Procedure. Proceed with the following instructions to determine the effective amount of antifoam:

- (1) In the 2 L beaker, weigh out 1 g (1 mL) of antifoam using an eyedropper or the pipette.
- (2) Add 999 g of water.
- (3) Mix well.
- (4) Weigh out 1000 g of the solution to be defoamed and place it in the gallon jug.
- (5) Add 10 g (10 mL) 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 (mL) that are required to eliminate the foaming.
- (7) The number of grams (mL) 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:

$$W = 8.32 V \times D + 1,000.000$$

where:

V = Volume of solution to be defoamed in U.S. gal

D = ppm of antifoam required

W = lb of antifoam required

Example

10,000 gal of foam solution require defoaming. The procedure above has determined that 150 ppm of antifoam are needed to defoam this solution: $8.32 \times 10,000 \times 150 \div 1,000,000 = 12.48$ lb.

- (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.

F.7 Discharge of Foam Solution to Wastewater Treatment Facilities.

Biological treatment of foam solution in a wastewater treatment facility is an acceptable method of disposal. However, foam solutions have the potential to cause plant upsets and other problems if not carefully handled. The reasons for this are explained in [F.7.1](#) through [F.7.4](#).

F.7.1 Fuel Contamination. Foam solutions have a tendency to emulsify hydrocarbon fuels and some polar fuels that are only slightly soluble in water. Water-soluble polar fuels will mix with foam solutions. The formation of emulsions will upset the operation of fuel/water separators and potentially cause the carryover of fuel into the waste stream. Many fuels are toxic to the bacteria in wastewater treatment plants.

F.7.2 Foaming. The active ingredients in foam solutions will cause copious foaming in aeration ponds, even at very low concentrations. Aside from the nuisance value of this foaming, the foaming process tends to suspend activated sludge solids in the foam. These solids can be carried over to the outfall of the plant. Loss of activated sludge solids can also reduce the effectiveness of the wastewater treatment. This could cause water quality problems such as nutrient loading in the waterway to which the outfall is discharged. Because some surfactants in foam solutions are highly resistant to biodegradation, nuisance foaming can occur in the outfall waterway.

F.7.3 BOD (Biological Oxygen Demand). Foam solutions have high BODs compared to the normal influent of a wastewater treatment plant. If large quantities of foam solution are discharged to a wastewater treatment plant, shock loading can occur, causing a plant upset.

Before discharging foam solutions to a wastewater treatment plant, the plant operator should be contacted. This should be done as part of the emergency planning process. The plant operator will require, at a minimum, a Material Safety Data Sheet (MSDS) on the foam concentrate, an estimate of the five-day BOD content of the foam solution, an estimate of the total volume of foam solution to be discharged, the time period over which it will be discharged, and, if the foam concentrate is protein-based, an estimate of the ammonia nitrogen content of the foam solution.

The foam manufacturer will be able to provide BOD and ammonia nitrogen data for the foam concentrate, from which the values for foam solution can be calculated. The other required information is site-specific and should be developed by the operator of the facility from which the discharge will occur.

F.7.4 Treatment Facilities. Foam concentrates or solutions can have an adverse effect on microbiologically based oily water treatment facilities. The end user should take due account of this before discharging foam systems during testing or training.

F.8 Foam Product Use Reporting.

Federal (U.S.), state, and local environmental jurisdictions have certain chemical reporting requirements that apply to chemical constituents within foam concentrates. In addition, there are also requirements that apply to the flammable liquids to which the foams are being applied. For example, according to the U.S. Environmental Protection Agency (EPA), the guidelines in [F.8.1](#) through [F.8.4](#) must be adhered to.

F.8.1 Releases of ethylene glycol in excess of 5000 lb are reportable under Sections 102(b) and 103(a) of U.S. EPA Comprehensive Environmental Response Compensation & Liability Act (CERCLA). Ethylene glycol is generally used as a freeze-point suppressant in foam concentrates.

F.8.2 As of June 12, 1995, the EPA issued a final rule 60 CFR 30926 on several broad categories of chemicals, including the glycol ethers. The EPA has no reportable quantity for any of the glycol ethers. Thus foams containing glycol ethers are not subject to EPA reporting. Consult the foam manufacturer's MSDS to determine if glycol ethers are contained in a particular foam concentrate.

F.8.3 The EPA does state that CERCLA liability continues to apply to releases of all compounds within the glycol ether category, even if reporting is not required. Parties responsible for releases of glycol ethers are liable for the costs associated with cleanup and any natural resource damages resulting from the release.

F.8.4 The end user should contact the relevant local regulating authority regarding specific current regulations.

F.9 Environmental Properties of Hydrocarbon Surfactants and Fluorochemical Surfactants.

Fire-fighting foam agents contain surfactants. Surfactants or surface active agents are compounds that reduce the surface tension of water. They have both a strongly "water-loving" portion and a strongly "water-avoiding" portion.

Dish soaps, laundry detergents, and personal health care products such as shampoos are common household products that contain hydrocarbon surfactants.

Fluorochemical surfactants are similar in composition to hydrocarbon surfactants; however, a portion of the hydrogen atoms have been replaced by fluorine atoms. Unlike chlorofluorocarbons (CFCs) and some other volatile fluorocarbons, fluorochemical surfactants are not ozone depleting and are not restricted by the Montreal Protocol or related regulations. Fluorochemical surfactants also have no effect on global warming or climate change. AFFF, fluoroprotein foam, and FFFP are foam liquid concentrates that contain fluorochemical surfactants.

There are environmental concerns with use of surfactants that should be kept in mind when these products are used for extinguishing fires or for fire training. These concerns are as follows:

- (1) All surfactants have a certain level of toxicity.
- (2) Surfactants used in fire-fighting foams cause foaming.
- (3) Surfactants used in fire-fighting foams can be persistent. (This is especially true of the fluorine-containing portion of fluorochemical surfactants.)
- (4) Surfactants can be mobile in the environment. They can move with water in aquatic ecosystems and leach through soil in terrestrial ecosystems.

[F.9.1](#) through [F.9.5](#) explain what each of these properties mean and what the properties mean in terms of how these compounds should be handled.

F.9.1 Toxicity of Surfactants. Fire-fighting agents, used responsibly and following Material Safety Data Sheet instructions, pose little toxicity risk to people. However, some toxicity does exist. The toxicity of the surfactants in fire-fighting foams, including the fluorochemical surfactants, is a reason to prevent unnecessary exposure to people and to the environment. It is a reason to contain and treat all fire-fighting foam wastes whenever feasible. One should always make plans to contain wastes from training exercises and to treat them following the suppliers' disposal recommendations as well as the requirements of local authorities.

Water that foams when shaken due to contamination from fire-fighting foam should not be ingested. Even when foaming is not present, it is prudent to evaluate the likelihood of drinking water supply contamination and to use alternate water sources until one is certain that surfactant concentrations of concern no longer exist. Suppliers of fire-fighting foams should be able to assist in evaluating the hazard and in recommending laboratories that can do appropriate analysis when necessary.

F.9.2 Surfactants and Foaming. Many surfactants can cause foaming at very low concentrations. This can cause aesthetic problems in rivers and streams, and both aesthetic and operational problems in sewers and wastewater treatment systems. When too much fire-fighting foam is discharged at one time to a wastewater treatment system, serious foaming can occur. The bubbles of foam that form in the treatment system can trap and bring flocks of the activated sludge that treat the water in the treatment system to the surface. If the foam blows off the surface of the treatment system, it leaves a black or brown sludge residue where the foam lands and breaks down.

If too much of the activated sludge is physically removed from the treatment system in foam, the operation of the treatment system can be impaired. Other waste passing through the system will then be incompletely treated until the activated sludge concentration again accumulates. For this reason, the rate of fire-fighting foam solution discharged to a treatment system has to be controlled. Somewhat higher discharge rates can be possible when antifoaming or defoaming agents are used. Foam concentrate suppliers can be contacted for guidance on discharge rates and effective antifoaming or defoaming agents.

F.9.3 Persistence of Surfactants. Surfactants can biodegrade slowly and/or only partially biodegrade. The fluorochemical surfactants are known to be very resistant to chemical and biochemical degradation. This means that, while the non-fluorochemical portion of these surfactants can break down, the fluorine-containing portion can likely remain. This means that after fire-fighting foam wastes are fully treated, the waste residual could still form some foam when shaken. It could also still have some toxicity to aquatic organisms if not sufficiently diluted.

F.9.4 Mobility of Surfactants. Tests and experience have shown that some surfactants or their residues can leach through at least some soil types. The resistance of some surfactants to biodegradation makes the mobility of such surfactants a potential concern. While a readily degradable compound is likely to degrade as it leaches through soil, this won't happen to all surfactants. Thus, if allowed to soak into the ground, surfactants that don't become bound to soil components can eventually reach groundwater or flow out of the ground into surface water. If adequate dilution has not occurred, surfactants can cause foaming or concerns about toxicity. Therefore, it is inappropriate to allow training waste to continually seep into soil, especially in areas where water resources could be contaminated.

F.9.5 Environmental Regulation of Fluorochemical Surfactants.

Fluorochemical surfactants and related fluorochemical polymers are used in many applications besides fire fighting foams including paper and packaging, textiles, leather and carpet treatment, and coatings. Some of these fluorochemicals and/or their persistent degradation products have been found in living organisms, which has drawn the concern of environmental authorities worldwide and led to both regulatory and non-regulatory actions to reduce emissions. The focus of these actions has been on fluorochemicals that contain eight carbons (C8) or more such as PFOS (perfluorooctane sulfonate) and PFOA (perfluorooctanoic acid).

3M used a unique process to manufacture the fluorochemical surfactants contained in its fire fighting foams. This process is called electrochemical fluorination (ECF), and fluorochemicals produced by this process both contain and degrade into PFOS. 3M stopped the manufacture of PFOS-based foams in 2002, and regulations in the United States (US), Canada, and the European Union (EU) act as a ban on new production. EPA regulations do not restrict the use of old stocks of PFOS foam in the US. Regulations in the EU and Canada require old stocks of PFOS foam to be removed from service in 2011 and 2013, respectively. Excess stocks of PFOS foam concentrate can be destroyed by high temperature incineration at any approved hazardous waste destruction facility.

All current manufacturers use a process called telomerization to produce the fluorochemical surfactants contained in their fire fighting foams. Chemicals produced by this process are generally referred to as telomers. Telomer-based foams do not contain or degrade into PFOS. They are not made with PFOA, but may contain trace levels as a contaminant of the manufacturing process. Rather than regulate emissions of PFOA, EPA developed a global stewardship program where fluorochemical manufacturers have voluntarily agreed to reduce 95% by year-end 2010 and work to eliminate by year-end 2015 emissions of PFOA, PFOA precursors, and higher homologue chemicals. As a result, telomer-based fluorochemicals that are used in fire fighting foams after 2015 are likely to contain only six carbons (C6) or less in order to comply with the EPA program. This will require some reformulation and likely some type of re-approval of most current foam products between 2010 and 2015.

Regulatory authorities will continue to evaluate the environmental impacts of fluorochemicals and it is possible that regulations could change in the future.

F.9.6 Minimizing Emissions of Fluorochemical Surfactants. Because of their persistent nature, emissions of fluorochemical surfactants to the environment should be minimized whenever possible using the following techniques:

- (1) Use training foams that do not contain fluorochemical surfactants.
- (2) Provide for containment, treatment, and proper disposal of foam discharges.
- (3) Follow applicable industry standards on the design, installation, and maintenance of foam systems and extinguishers.
- (4) Minimize false discharges from fixed foam systems by using approved detection, actuation, and control systems as required by industry standards.
- (5) When appropriate consider treating collected wastewater with granular activated carbon (GAC) or a membrane process such as reverse osmosis to remove the fluorochemical surfactants prior to disposal.

Substantiation: This information reflects the most current information available from both the USEPA and the Fluoro-Chemical Manufacturer's.

Committee Meeting Action: Accept

Number Eligible to Vote: 26

Ballot Results: Affirmative: 17

Ballot Not Returned: 9 LaVergne, E., Leedy, J., Owen, D., Santerre, G., Slye, Jr., O., Vandersall, H., Westwood, K., Williams, M., Workman, M.

Comment on Affirmative:

BATEMAN, V.: Section F.8.3 needs clarification. The EPA definition of glycol ethers does not include propylene glycol per Federal Register, August 2, 2000 Volume 65, Number 149 Rules and Regulations, Page 47342-47348. The EPA does state that CERCLA liability continues to apply to releases of compounds within the ethylene glycol ether category, even if reporting is not required. The glycol ethers in the ethylene glycol ether category are restricted to mono- and di-ethers of ethylene glycol, diethylene glycol, and triethylene glycol. Parties responsible for releases of glycol ethers are liable for the costs associated with cleanup and any natural resource damages resulting from release.

F.9.5 needs to be amended as follows: Most current manufacturers use a process called telomerization to produce the fluorochemical surfactants contained in their fire fighting foams.